

**Ministry of Science and Higher Education of the
Republic of Kazakhstan
MAQSUT NARIKBAYEV UNIVERSITY**

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**Beyond Reality: Protection of IP Rights in the Intersection of the
Metaverse**

Educational program 7M04210 Intellectual Property and Business Law

Dissertation for the academic degree of Master of Law

Astana, 2025

MNU Research Archive

**Ministry of Science and Higher Education of the Republic of
Kazakhstan**

MAQSUT NARIKBAYEV UNIVERSITY

<<Admitted to the Defense>>
Program Manager/ Coordinator

____ April, 2025

MASTER'S DISSERTATION (PROJECT)

On the topic: "Beyond Reality: Protection of IP Rights in the Intersection
of the Metaverse"

According to the educational program 7M04210 Intellectual Property and
Business Law

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Astana, 2025

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_____, April, 2025

**The calendar plan for the preparation of a master's dissertation
(project)**

Name of the Project Stages	Period	A note on the implementation of the project stages			
		Actual completion date	The degree of readiness of the completed stage of the project	Signature of the postgraduate	Signature of the supervisor
Review of literature and practical materials	20.09.24-01.01.25	01.01.25	100%		
Methodology development	01.12.24-31.12.24	31.12.24	100%		
Data Collection and processing	01.12.24-31.12.24	31.12.24	100%		
Analysis and interpretation of the results obtained	25.12.24-10.01.25	10.01.25	100%		
Development of project recommendations	01.01.25-07.01.25	07.01.25	100%		
Preparation of the introduction and conclusion	16.01.25-01.02.25	01.02.25	100%		

Preparation of dissertations (project): Preparation of the first section of the project Preparation of the II, III section of the project	01.02.25-15.03.25	15.03.25	100%		
Preparation of the IV,V, VI section of the project	16.03.25-05.04.25	05.04.25	100%		
Receiving feedback from the supervisor (scientific supervisors)	05.04.25-10.04.25	10.04.25	100%		
Preparation of a report, visual aids and presentations	10.04.25-27.04.25	27.04.25	100%		
Defense of the master's thesis (project)	27.04.25	27.04.25	100%		

Scientific supervisor of the Master's dissertation (project): _____

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The plan was accepted for execution: _____

Abu Bakar Mokarim

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LIST OF ABBREVIATIONS USED

Abbreviation	Full Form
&	And
IP	Intellectual Property
IPR	Intellectual Property Rights
AR	Augmented Reality
VR	Virtual Reality
XR	Extended Reality
AI	Artificial Intelligence
AI-ML	Artificial Intelligence and Machine Learning
DL	Deep Learning
ML	Machine Learning
IoT	Internet of Things
VRM	Virtual Reality Modelling
HMD	Head-Mounted Display
NFT	Non-Fungible Token
DAAP	Decentralized Application
DAO	Decentralized Autonomous Organization
UGC	User-Generated Content
DLT	Distributed Ledger Technology
GDPR	General Data Protection Regulation
FTO	Freedom to Operate
FRAND	Fair, Reasonable, and Non-Discriminatory
TOS	Terms of Service
EULA	End-User License Agreement
DMCA	Digital Millennium Copyright Act
WIPO	World Intellectual Property Organization
TRIPS	Trade-Related Aspects of Intellectual Property Rights
WCT	WIPO Copyright Treaty
WPPT	WIPO Performances and Phonograms Treaty
WTO	World Trade Organization
EU	European Union
US	United States
UK	United Kingdom
B2B	Business to Business
B2C	Business to Consumer
USPTO	United States Patent and Trademark Office
IPAB	Intellectual Property Appellate Board
SSO	Standard-Setting Organization

INTRODUCTION

a. Introduction:

In this digital era, two emerging and potential fields that are reaching a very rapid rate are artificial intelligence and metaverse. The choice to choose this topic “Beyond Reality: Protecting IP in the Intersection of the Metaverse” for this dissertation is driven by the burgeoning influence of digital space in global market and social interaction. As the metaverse is the virtual world, day-to-day traditional legal norms are being tested and are often found to be lacking. Similarly, this research on this topic is timely needed and essential to test whether traditional principles of intellectual property Law are able to protect the rights of intellectual property owners. This research is essential considering the rapid rate at which various businesses are entering virtual spaces to prioritize their business and the potential chances to constitute intellectual property infringement.

As of now, the metaverse works on a very complex governance landscape, which includes centralized and other decentralized natures. And both lack a centralized governing body. In the absence of a governing body, it shows a potential challenge, which may be in enforcing intellectual property rights, particularly in terms of trademark, copyright, and other intellectual property rights. The absence of a harmonized or unified legal framework leads to IP infringement and complicates governance and enforcement for IP protection. This necessitates a novel approach to address these challenges.¹

The rise of Non-Fungible Tokens (NFTs) in the metaverse has led to significant IP challenges. The lack of any unified laws or any specific national laws relating to digital invention forced the adaption of the existing legal framework.² However, traditional IP Laws are not fully equipped to handle the complexities of the metaverse. The absence of a clear definition of the metaverse complicates the application of traditional IP laws. Current IP laws are based on territorial, and time has changed in scenarios of missing a border in the metaverse, particularly concerning IP contours and their enforcement. In addition, the problems with digital

¹ Mousa Al-Kfairy, Saef Alrabaee, and Omar Alfandi, “Navigating the Ethical Landscape of Metaverse: Challenges, Solutions and Governance Initiatives” (2025) <<https://papers.ssrn.com/sol3/Delivery.cfm/4447c0eb-799d-4d1b-82e0-d60f88ce8c71-MECA.pdf?abstractid=5080379&mirid=1>> accessed 3 January 2025

² IKENNA U. Ibe; OBIANYO CIA, ‘A Critical Appraisal of the Legal Framework for the Protection of Intellectual Property Rights of Non-Fungible Tokens (NFTs) and Metaverse’ (CHUKWUEMEKA ODUMEGWU OJUKWU UNIVERSITY JOURNAL OF PRIVATE AND PUBLIC LAW) <<https://www.nigerianjournalsonline.com/index.php/COOUJPPL/article/view/3968>> accessed 16 December 2024

creation protection in the metaverse added. These laws are typically made for territory and are not adequate for cross-border.³

Due to metaverse's global nature and traditional IP Laws based on territoriality, jurisdictional challenges arising in present nature. This necessitates a re-evaluation of jurisdictional principles to accommodate the digital environment. Effective enforcement of IP rights in the metaverse requires robust digital forensic capabilities to track and address infringement across virtual platforms.⁴

b. Statement of Problem

The Metaverse is now progressing quite rapidly, and every day it is still transforming in ways that bring considerable challenges in the area of intellectual property protection. At the moment, traditional IP laws are inadequate to meet these possible challenges, and the main problem is that they cannot be adapted to the metaverse itself, and thus leave significant gaps in the protection and enforcement of IP rights. For now, it is well established that the Metaverse is rapidly growing, and every day brings some magic transformation to it. However, this is fraught with challenges concerning intellectual property protection. Presently, it cannot be met by the traditional IP laws. In fact, the major problem remains in the inability to go with the nature of the metaverse in comparison, which gives rise to very wide gaps in the protection and enforcement of IP rights.

Further inadequacy can be seen in the absence of any clear definition of metaverse in the realm of intellectual property rights. In trademark, due to the absence of clear classes for digital goods and services, it seems to be inadequate at this time. This was also observed by several courts around the globe, which opened up about these issues, and, till now, they remain open-ended. Such ambiguity leads to potential infringement issues because of legal frameworks that seem to be struggling to adapt to the rapid growth of digital space. Further, challenges to address can be seen in digital forensics, which is also not clear in the case of metaverse, which shows potential challenges in the enforcement of intellectual property. Consequently, there is an urgent need to find all the potential challenges that are arising and may arise in the future in the realm of protection of Intellectual Property and further address them by laying out an innovative approach to robust the protection of intellectual property.

³ Tshimanga Kongolo, *Intellectual Property and Emerging Technology Generated Global IP Issues and Challenges* (first published 2025, Routledge)

⁴ Peter Mezei and Gunjan Chawla Arora, 'Copyright and Metaverse' (*Elgaronline*, 23 August 2024) <<https://www.elgaronline.com/edcollchap/book/9781035324866/book-part-9781035324866-19.xml>> accessed 25 December 2024

c. Research Objectives:-

The study aims to explore, find, and discuss some IP challenges arising and potential challenges that may arise in the metaverse in the realm of intellectual property rights. This study aims to identify the gaps in present traditional IP laws when applied in digital space. Further this study aims to provide legal framework which addresses and resolve all the current and potential challenges. This frame would would safeguard the rights of Intellectual Property owner and aims to robust legal framework which would ensure the protection and enforcement of IP rights in metaverse.

d. Key Research Questions

- ❖ How does the governance structure of the metaverse address grey areas in intellectual property rights (IPR) related to copyright, trademark, and personality rights, particularly regarding enforcement challenges, and territorial jurisdiction?
 - i. How the action in the metaverse is leading to IP infringement, and what are the specific are specific challenges in identifying and addressing these infringements?
 - ii. Are current IP laws sufficient to address the unique challenges posed by the metaverse, or is there a need for a legal framework?
 - iii. How can current territorial-based intellectual property laws be adapted and implemented effectively in the metaverse, considering its global and decentralized nature?
 - iv. What are the emerging solutions or proposals to resolve the issues of IP protection, jurisdictional disputes, and governance in the metaverse, and how can international cooperation be fostered in this context?

e. Hypothesis:-

The current traditional IP laws followed around seem to be adequate for application in the metaverse. Metaverse which is in itself sphere or another world. Applying traditional IP laws in such an advanced digital space throws challenges such as jurisdictional, enforcement challenges. A separate law is needed to tackle these issues. A clear definition of metaverse in the realm of intellectual property rights. Without addressing the challenges and such a new framework, there will be a significant gap in the protection and enforcement of intellectual property. Not addressing the issues in a timely manner will lead to more IP infringement and legal disputes in the future. This study will test this hypothesis by analyzing whether current traditional IP laws are adequate to address such challenges and, if not, will suggest some legal innovations or frameworks which will robust the protection of intellectual property in the metaverse.

f. Research Methodology

This study applies a mixed approach, which includes doctrinal, qualitative, and comparative approaches. Doctrinal analysis examined existing IP Laws and their applicability in the metaverse. A qualitative approach includes the observation made by the jurist in the area of metaverse in the realm of intellectual property. Case studies that are used to illustrate specific instances of IP challenges in virtual environments, providing practical insights into the enforcement and governance issues. An analysis made of how present principles of IP, such as territorial principle, lack in present practice and challenges in enforcement and digital forensics. Furthermore, the Comparative approach includes examining international approaches to handling IP issues in the metaverse. Countries, mainly the US, UK, EU, and Indian legislations and case precedents will be compared and analyzed in addressing this kind of issue.

g. Literature Review

Articles, Research papers

i. Second Life, Video Games, and the Social Text⁵

This paper discussed the copybot scandal, which is relevant to intellectual property disputes in virtual environments. This highlighted the copyright protection in the realm of the metaverse and broader discourse on the adaptability of current IP law in this evolving nature of the metaverse. This paper also explores the potential challenges in virtual worlds like Second Life in terms of protection and enforcement of intellectual property, which requires adaptation and evolving legal principles alongside technological advancements.

ii. The Metaverse: A Revolution In The Digital Age⁶

This paper explores the concept, characteristics, and evolution of the metaverse. It emphasizes decentralization and secure data management of the metaverse significance of the blockchain.

iii. Hohfeld's analysis of rights and rights in Metaverse⁷

This paper analyzed the relevance of Hohfeld's right analysis in metaverse legal challenges. Hohfeld's concepts delineate rights, duty, and immunity relationships within the virtual spaces. Applying Hohfeldian theories of digital phenomena such as privacy rights,

⁵ Steve E Jones, 'Second Life,' Video Games, and the Social Text' PMLA, 124(1) 264. <<http://www.jstor.org/stable/25614266>> 17 December 2024.

⁶ Tyron D Tabron, 'The Metaverse: A Revolution in the Digital Age' US Black Engineer and Information Technology, 48(1), 93–94 <<https://www.jstor.org/stable/48788595>> accessed 27 December 2024.

⁷ Hithaishi Murthy, 'Hohfeld's Analysis of Rights and Rights in Metaverse' (2022) 4 Indian JL & Legal Rsch 1

digital asset management, and governance will refine the way to tackle the challenges in the metaverse. Analysis suggested enhancing digital literature and extending legal protection to encompass virtual interactions.

iv. The Legal Muddle of The Metaverse⁸

This paper explores legal challenges in the metaverse where it is addressed related to Roc-A—Fella’s lawsuit against Damon Dash over the minting of Jay-Z’s Album. This case was related to IP conflicts within the metaverse. To safeguard the rights in the metaverse, it is necessary to enact laws related to consumer protection, data privacy, cybersecurity measures, IP protection, and many more. This paper also suggested collaboration with research institutions and stakeholders to get a harmonized legislative framework to navigate the legal challenges in metaverse.

v. Governing The Metaverse⁹

This paper explores the primary and secondary sources to articulate the challenges and evolving landscape of legal, ethical, and technological considerations. This paper addressed the need for codified legal framework for the governance of decentralized nature of metaverse. Further suggested for updating legal norms considering the evolving nature of virtual world. Further suggested research and collaboration with the diverse stakeholders to provide balance and sustainability between the innovation and responsibilities. This would foster inclusive and equitable environments in virtual world.

vi. If the metaverse is built, will copyright challenges come?¹⁰

This paper addressed the copyright challenges in the metaverse. Due to the traditional approach in copyright law and its principles, challenges are being faced for the adaption according to the current trends in the metaverse. Judicial pronouncement plays an important role in interpreting the law and its applicability in the metaverse. Judicial pronouncement reaffirms the role and test of originality and challenges in copyright infringement in virtual spaces. Harmonized frameworks and effective jurisdictional approaches are required for copyright protection and enforcement in virtual space.

⁸ Shraddha Shenoy, 'The Legal Muddle of the Metaverse' (2023) 5 Indian JL & Legal Rsch 1

⁹ Jesse Valente, 'Governing the Metaverse' (2024) 9 IPCLJ 135

¹⁰ Levan Nanobashvili, 'If the Metaverse Is Built, Will Copyright Challenges Come?' (2022) 21 UIC Rev Intell Prop L [i]

vii. Legal Challenges of Intellectual Property in the Metaverse Under UAE Intellectual Property Law: Trademarks, Copyrights, Patents¹¹

This paper explores the global nature of the metaverse and its impact on trademark territoriality, emphasizing the unauthorized use of trademarks in virtual worlds, as seen in the Hermès vs. Rothchild case, where trademark infringement was done in the metaverse.

viii. The Issues of Intellectual Property in the Realm of Metaverse¹²

This paper explores the development and how different nations are tackling or responding to the Intellectual Property issues in the metaverse. It highlighted the need for comprehensive, unified regulation to address such issues. It also emphasized the registration of NFTs for better IP and legal protection. This study highlighted the gap in existing law, which does not address the virtual and evolving nature of the metaverse.

ix. Digital Forensics for Safeguarding Intellectual Property Rights: A Study in the Context of Indian IPR Laws¹³

This literature review identifies the role of digital forensics in the enforcement of Intellectual Property rights. Digital Forensics is a crucial tool in identifying, preserving, and analyzing digital evidence, which is very important for legal investigation involved in IP infringement cases. These challenges are relevant in the era of the metaverse, where traditional methods are often inadequate.

This paper identifies the challenges involved are limited resources, evolving technologies, and the need for a robust legal framework. The gap in this context is missing the legal frameworks in different jurisdictions, which weakens the effectiveness of digital forensics in IP rights enforcement.

¹¹ Shukh Hussian, 'Legal challenges of intellectual property in the metaverse under UAE intellectual property law: Trademarks, copyrights, patents' (2024) Intelligent Metaverse Technologies Applications (iMETA) 246 < doi:10.1109/imeta62882.2024.10808155> accessed 25 December 2024.

¹² Abdusatarov J and Turdialiev MA, 'The Issues of Intellectual Property in the Realm of Metaverse' Social Science Research Network

¹³ Hegde C, Naik SC and Kumar LA, 'Digital Forensics for Safeguarding Intellectual Property Rights: A Study in the Context of Indian IPR Laws' (2024) 29 Journal of Intellectual Property Rights, National Institute of Science Communication and Policy Research 500

x. Digital Forensic in a Virtual World: A Case of Metaverse and VR¹⁴

This paper addresses the challenges of cyberattacks in the metaverse and suggests a forensic framework to trace the evidence in virtual environments. This paper also highlighted the importance of forensic methodology to collect and handle the evidence and further conduct investigations in digital space. There is a need for a robust legal framework to safeguard the rights of ownership in metaverse such as NFT. Lack of clarity in regulation, in the metaverse poses a threat to creators and businesses.

xi. EU Trademarks in the Metaverse¹⁵

This paper reviewed the EU Trademark law's applicability in the metaverse, which was found to be inadequate in the context of evolving digital form. The complexity involved in registering trademarks operating in Metaverse. The decentralized nature of metaverse and jurisdictional issues complicates the enforcement of EU trademark rights and the necessity of registering in today's world. The lack of any definition creates disbalance around the globe and affects IP rights. Other issues, such as legal and ethical questions regarding ownership, copyright, and trademark rights, are raised, which require a comprehensive legal framework.

xii. Trademarks, NFTs, and the Law of the Metaverse¹⁶

This paper provides a comprehensive background on trademark law and its application to NFTs within the metaverse. The potential issues are trademark infringement, false endorsement, and other complexities introduced by digital assets. The decentralized nature of the metaverse poses challenges such as jurisdictional where determining applicable laws and authority is challenging. It makes it difficult to make applicable traditional laws in this digital world. Countries like South Korea and UAE are integrating metaverse technologies into government functions and highlighted the need for international regulations to address IP issues in the metaverse. Further, the collection of infringing evidence is crucial and challenging as the nature of the metaverse involving blockchain makes identifying IP infringement difficult without a robust mechanism.

¹⁴ Tayba Al Ali, Sara Al Fulaiti, Manal Abuzour, Sheikha almaghami and Ikuesan Richard Adeyemi, 'Digital Forensic in a Virtual World; a Case of Metaverse and VR' (2023) 22 European Conference on Cyber Warfare and Security 12

¹⁵ Cesar Ramirez-Montes, 'EU Trademarks in the Metaverse' (2023) 63 IDEA 555

¹⁶ Murray MD, 'Trademarks, Nfts, and the Law of the Metaverse' [2022] SSRN Electronic Journal.

xiii. Trademarking In the Metaverse: Unveiling the Boundless Potential¹⁷

This paper explores the impact of user-generated content and the significant challenges to brand identity and trademark protection. The nature of user generated content could lead to unauthorized use and constitute trademark infringement. Due to jurisdiction issues and the anonymity of users, it is difficult to identify infringers and enforce legal actions across different platforms. The research gap is that there is a cross-jurisdictional enforcement mechanism that can operate across borders in the nature of the metaverse. Any mechanism for tracking blockchain to identify the potential infringer.

xiv. The Subsistence and Enforcement of Copyright and Trademark Rights in The Metaverse¹⁸

The paper implies challenges in IP enforcement due to the anonymous and borderless nature of the metaverse, mainly focussed on copyright and trademark in the jurisdiction of US and EU jurisprudence. Ownership and protection of User-generated content in decentralized platforms remain underexplored. Comprehensive frameworks are needed to balance innovation for IP protection.

xv. Metaverse Governance: An Empirical Analysis of Voting within Decentralized Autonomous Organizations¹⁹

This paper identified the challenges posed by the absence of a unified governance system in centralized architectures in virtual worlds and

This paper identifies the challenges posed by centralized architectures in virtual worlds and advocates for open stand and decentralized governance to mitigate potential monopolistic tendencies. Such issues lead to the infringement of IP rights within the metaverse.

¹⁷ Dewadal S, 'TRADEMARKING IN THE METAVERSE: UNVEILING THE BOUNDLESS POTENTIAL' (2024) International Research Journal of Modernization in Engineering Technology and Science e-ISSN 2582.

¹⁸ Saw Lim C and Chan Samuel Wen Z, 'The Subsistence and Enforcement Of Copyright And Trademark Rights In The Metaverse' [2024] Journal of Intellectual Property Law and Practice 19, (4) 371.

¹⁹ Mitchell Goldber and Fabian Schar, 'Metaverse Governance: An Empirical Analysis of Voting Within Decentralized Autonomous Organizations' (*Science Direct*, 2024) <<https://www.sciencedirect.com/science/article/pii/S0148296323001224> > accessed 13 December 2024.

xvi. Marking the Metaverse: The Implication of NFTs on Trademark Law²⁰

The intersection of NFTs and trademarks possess legal challenges which may constitute trademark infringement. Companies must develop robust IP strategies to protect digital assets and brands present in the metaverse. In the absence of a structured legal framework, that's a potential threat. Although NFTs can fit in traditional trademark laws but create new liabilities for infringement.

xvii. Metaverse and Intellectual Property Rights²¹

Current IP laws being not compatible with the metaverse which leading towards more IP rights infringement. It is becoming more and more important to comprehend the laws that are fundamental to it. The transition to virtual reality could lead to new problems with protecting trade secrets. Nowadays, it is also important to manage the IP portfolio for Metaverse as well as to protect IP rights in all spheres.

xviii. Navigating the Metaverse Business and Legal Challenges: Intellectual Property, Privacy and Jurisdiction²²

Metaverse presents several legal challenges, such as virtual property ownership, intellectual property rights infringements, and user privacy. It can be addressed by defining clear jurisdiction and a dispute resolution framework, which can be addressed for disputes related to the metaverse. A self-regulatory framework will not provide adequate outcomes.

xix. Control Over Virtual Worlds by Game Companies: Issues and Recommendations²³

This paper investigates the governance of virtual worlds using the 5Cs model, which includes copyright, code, creativity, community, and contracts. This paper suggested a legal framework to manage economic transactions and ownership in virtual worlds. The legal framework will also guide game companies to avoid the ambiguity they face related to the 5Cs. Copyright Infringement and owner challenges are being observed by the game companies while dealing in virtual worlds.

²⁰ Hanna Esserman, 'Marking the Metaverse: The Implication of NFTs on Trademark Law' [2024] 31 J. Intelle Prop L. 67

²¹ Anshika Srivastava, 'Metaverse and Intellectual Property Rights' (2023) 3 Jus Corpus LJ 195

²² Maria Kalyvaki, 'Navigating the Metaverse Business and Legal Challenges: Intellectual Property, Privacy and Jurisdiction' [2023] vol 3 issue 1 page 87.

²³ Christophe Roquilly, 'Control Over Virtual Worlds by Game Companies: Issues and Recommendations' (2011) MIS Quarterly 35(3) 653 <<https://doi.org/10.2307/23042802>> accessed 21 December 2024.

xx. Metaverse Technology and The Legal Implication of Its Emergence²⁴

This paper explores the future potential challenges and its growth to be expected to work \$679 billion by 2030. The more growth in the market, the more likely it is to be intellectual property infringement. Countries from different need to come together to unify the law and make jurisdiction. This needs to take one step ahead to protect the IP owner's rights. Other factors could lead to more severe infringements.

Case Laws: -

i. Hermes International v. Rothschild (Meta Birkin Case)²⁵

This case has been a landmark case till now in trademark infringement in the realm of NFTs. In this case, luxury brand Hermes International sues an artist for creating, selling, and minting NFTs named "Metabirkins" in the Metaverse, which clearly shows trademark violation as Hermes iconic Birkin Bags have been owned by Hermed Inteneration for a long time. The court considered both trademark infringement and cybersquatting.

In this case, questions were raised regarding the inadequacy of traditional trademark doctrines in addressing consumer confusion in digital space. This case opened eyes and awareness to other brands in the market to register their brand name of their products for downloadable virtual goods and online virtual services. This case spotlighted the need for a robust legal framework which may minimize IP infringement in digital space.

ii. Nike, Inc. v. StockX LLC²⁶

In this case, Nike, a prominent shoe brand, sued StockX for infringing on the registered trademark by selling the shoes in Metaverse using Nike's brand name. Nike alleges in the suit that StockX used the logos without any license or consent, which shall constitute trademark infringement. On the other hand, StockX claims Nike's trademark limits to physical goods and that merely securing ownership of physical products doesn't constitute trademark infringement. The court focused on analyzing whether it constituted trademark infringement or merely if it was a digital representation of a legitimate resale market. The court emphasized the challenges

²⁴ Dr. Fatiha Benazouz, 'Metaverse Technology And The Legal Implication Of Its Emergence' [2024] vol xii Issue 2

²⁵ *Hermes Int'l v. Rothschild*, 654 F. Supp. 3d 268 (S.D.N.Y. 2023)

²⁶ *Nike, Inc. v. StockX LLC*, (22-CV-00983 (VEC)(SN) (S.D.N.Y. Jan. 9, 2023)

that were observed in applying traditional trademark principles in digital space.

iii. Yuga Labs, Inc. v. Ripps²⁷

This case relates to the enforcement of trademark rights in the context of digital art and collectibles. The creator of NFTs sued another for creating similar NFTs, which alleged to be trademark infringement. This case highlights the challenges of enforcement of trademarks in digital space. It was one of the interesting cases where both the products were NFTs and involved in digital space.

iv. MDY Industries, LLC v. Blizzard Entertainment, Inc.²⁸

This case relates to copyright infringement in the online gaming industry, which illustrates the complexities involved in the enforcement of IP rights in digital environments.

v. Exphar SA v. Eupharma Laboratories Ltd.²⁹

This case dealt with trademark infringement in a virtual world, which underscores the need for clear legal frameworks to balance IP rights and user freedoms

vi. Epic Games v. Apple³⁰

This case relates to antitrust and control over the distribution of Apple's iOS platforms. Epic raises concern for alleged monopolistic practices by not allowing competition. Such distribution over virtual places also raises concern. This makes relevant such cases where any party makes a monopoly in the metaverse, and not allowing competition will hinder any rights. If anyone uses a trademark without permission in the metaverse, the lack of legislation creates ambiguity in this era. This case highlighted such issues.

vii. Tencent v. Douyin³¹

This case relates to the copyright infringement where Tencent filed suit against Douyin for infringement of copyright by using copyrighted content related to the anime series "Soul Land" and the game "Honour of Kings." This case highlighted the lack of specific legal frameworks for IP protection in the virtual world and metaverse.

²⁷ *Yuga Labs. v. Ripps*, 2:23-cv-00010-APG-NJK (D. Nev. Jan. 6, 2023)

²⁸ *MDY Industries, LLC V. Blizzard Entertainment, Inc.*, No. CV-06-2555-PHX-DGC (D. Ariz. Apr. 1, 2009)

²⁹ *Exphar SA and Anr. v. Eupharma Laboratories Ltd. and Anr.*, (2004) 3 SCC 688

³⁰ *Epic Games v. Apple Inc.*, 493 F. Supp. 3d 817 (N.D. Cal. 2020)

³¹ *Tencent Company v Yingxun Company*, Case No. Y0305MC No. 14010

viii. LVMH Group v. eBay³²

This case is related to the intellectual property issue that arises in the online marketplace and its implications for the metaverse. LVMH, a luxury brand, accused eBay of facilitating the selling of counterfeit products on their platforms, which infringes the trademark and brand reputation. The case highlights the cross-border jurisdiction challenges, the enforcement of foreign IP rights, and the applicability of local laws to global brands such as eBay. This case highlights unified legislation for such issues.

BOOKS: -**i. Dr S Venkateswaran's The Trade Marks Act, 1999 by Venkateswaran on Trade Marks & Passing Off³³**

This book provides a comprehensive study regarding the trademark principles and a detailed analysis of all sections of the Trade Mark Act, 1999, in the content with Indian National Laws on Trademarks. However, this book covered various principles, such as the territorial principle, which is followed internationally. A critical analysis of different principles and subjects that are relevant to digital space is also conducted.

ii. Black's Law Dictionary by H.C. Black and B.A. Garner³⁴

The dictionary provides definitions of terms essential for this research, such as different types of IP infringement, the definition of metaverse, whether it is defined or not, and how it is defined. This dictionary provides necessary definitions, which are very essential for the research.

iii. Law Relating to Intellectual Property Rights by V.K. Ahuja³⁵

This book delves into international framework analysis that governs intellectual property, such as the TRIPS Agreement, which sets minimum standards for IP protection. This book discusses potential challenges for IP infringement.

³² LVMH Group v. eBay, [2010] EWCA Civ 1039.

³³ Venkateswaran K Ckailasam and M A Panchamia, *Venkateswaran on Trade Marks & Passing Off* (7th edn, Lexis Nexis)

³⁴ Garner Bryan A and Henry Campbell Black, *Black's Law Dictionary* (9th edn, St. Paul, MN, West, 2009)

³⁵ V K Ahuja, *Law Relating to Intellectual Property Rights* (3rd edn, Lexis Nexis 2017)

iv. The Metaverse: And How it Will Revolutionize Everything" by Matthew Ball³⁶

This book explores the potential challenges that may be faced in future in metaverse. It deals with the definition, evolution of metaverse and its impact on different sectors. Evolving nature of machine learning amid technological advancement is been discussed and the necessary component for metaverse such as networking, computing, blockchain etc are discussed in detail. This provides comprehensive background regarding the metaverse.

v. "Blockchain, Metaverse, and Intellectual Property" by Abbe Brown and Smriti Parsheera³⁷

This book provides a robust view that is directly related to blockchain technology, metaverse, and intellectual property. This book discusses the rapid growth of NFT and its potential implication of IP infringement on IP owners. It discusses the technology involved in blockchain and metaverse and further discusses the principles of intellectual property that relate to the digital space.

vi. "Intellectual Property in the Digital Age" by Edward Lee³⁸

This book provides the relation of intellectual property in the digital era and its implications. The impact on society, the economy, and many more. It discusses the relationship between Artificial Intelligence and the metaverse. The growth of people's interest in the metaverse. It was even seen that Facebook changed its name to Meta. However, a company cannot be considered for the whole sphere.

vii. "McCarthy on Trademarks and Unfair Competition" by J. Thomas McCarthy³⁹

This book is a comprehensive study of trademarks that deals with each and every aspect of trademarks. This book provides resourceful developments on particular topics related to trademark and their relations and impact on different fields.

³⁶ Matthew Ball, *The Metaverse: And How it Will Revolutionize Everything* (17th edn, Liverlight Publishing Corporation 2022)

³⁷ Abbe Brown and Smriti Parsheera, *Blockchain, Metaverse and Intellectual Property* (Edward Elgar Publishing 2023)

³⁸ Edward Lee, *Intellectual Property in the Digital Age* (Edward Elgar Publishing 2016)

³⁹ J Thomas McCarthy, *McCarthy on Trademarks and Unfair Competition* (5th edn, Thomsan Reuters 2017)

viii. Kerly's Law of Trade Marks and Trade Names" by Amanda Michaels, David Kitchin, and James Mellor⁴⁰

This book provides the concept of likely to confuse trademarks in a simplified manner. The analysis and application of this principle make it important to understand potential challenges related to trademark infringement in the metaverse. The concept states there shouldn't be any confusion in the consumer's mind while making any choice regarding the brand, even in the metaverse. The brand identification or name should appear clear without causing any confusion in the consumer's mind; otherwise, it could lead to trademark infringement.

ix. Copyright: Principles, Law, and Practice" by Paul Goldstein⁴¹

This book provides a detailed study of international copyright law and its principles. It further discusses the TRIPS and infringing in the digital era. Such a move is affecting copyright holders. It also talks about how the fair use doctrine applies to copyright and its misuse in the digital age. This observation can be used in the research as copyright infringement occurs in the metaverse.

x. Metaverse and the Law" by Kathleen St. Claire⁴²

This book provides a multidisciplinary approach including ethical consideration, jurisdictional challenges, enforcement challenges and need to harmonized legal framework to regulate, protect and enforcement of IP rights in metaverse. Its is current need to prioritize to address such challenges and otherwise it could lead to more ambiguity in future because of evolving nature of metaverse.

xi. The Law of Virtual and Augmented Reality" by Jesse Stein and Joseph M. Kizza⁴³

This book provides a study of the legal framework involved in the virtual environment; other threats are privacy concerns and trademark and copyright infringement in such platforms. It is related to the adaptation of current IP laws in the metaverse. It states the positive and negative sides of having current IP laws in the metaverse. It also addresses the evolving nature of the virtual world, such as NFTs and unauthorized use of user-generated data, and the complexity of tracing such data creates ambiguity.

⁴⁰ Amanda Michaels, David Kitchin, and James Mellor, *Kerley's Law of Trade Marks and Trade Names* (13th edn, Sweet & Maxwell 2018).

⁴¹ Goldstein, Pail, *Copyright: Principles, Law and Practice* (Oxford University Press 2001)

⁴² Kathleen St. Claire, *Metaverse and the Law* (Springer 2023)

⁴³ Jesse Stein and Joseph M Kizza, *The Law of Virtual and Augmented Reality* (Springer 2021)

xii. Metaverse Law: The Legal Challenges of a Virtual Future" by Gerald Spindler⁴⁴

This book discusses how existing IP laws struggle to settle in the metaverse. Both are not able to go in parallel. With time, both are intersecting with each other frequently; further trademark disputes over digital goods and ownership of virtual create another challenge.

xiii. Blockchain and Intellectual Property" by Andres Guadamuz⁴⁵

This book states regarding the interrelation of blockchain technology and IP law and addresses how decentralized intersects with IP laws, especially in the context of NFT-based digital assets. Digital copyright could be the concept in the age of the metaverse.

h. Chapterisation

CHAPTER I: UNDERSTANDING THE CONCEPT OF THE METAVERSE IN THE CONTEXT OF IP LAWS

This chapter explains the concept of the Metaverse, its evolution, core features, and its technological components, which include virtual and augmented reality, artificial intelligence, blockchain, smart contracts, non-fungible tokens, 5G, and edge computing. It further demonstrated the jurisdiction and enforcement in the virtual world and explained the governing structure of the metaverse. This chapter provides foundation and background for the study and understand the potential challenges related to IP protection in the intersection of Metaverse.

CHAPTER II: POTENTIAL CHALLENGES WITH RESPECT TO IP LAW IMPLEMENTATION IN METAVERSE

This chapter provides insights related to intellectual property and its evolution of IP along side with the legal challenges in applying traditional intellectual property concept and laws to modern virtual world i.e. Metaverse. It examines the issues of jurisdiction, territoriality, enforcement, ownership and lack of harmonized international legislation. It identifies main challenges in the decentralized nature of metaverse which creates significant enforcement and governance gaps.

⁴⁴ Gerald Spindler, *Metaverse Law: The Legal Challenges of a Virtual Future* (Springer 2022)

⁴⁵ Andres Guadamuz, *Blockchain and Intellectual Property* (Edward Elga Publishing 2022)

CHAPTER III: POTENTIAL CHALLENGES WITH RESPECT TO COPYRIGHT LAW IN THE INTERSECTION OF THE METAVERSE

This chapter identifies the potential challenges with specific to copyright such as related to AI-generated content, user generated works and the use of smart contracts. It further analyses how the traditional laws and doctrine of copyrights are tested in the virtual world to know the authorship, originality and infringement. Enforcement, challenges, and jurisdictional limitation are assessed critically.

CHAPTER IV: POTENTIAL CHALLENGES WITH RESPECT TO TRADE MARKS IN THE INTERSECTION OF THE METAVERSE

This chapter explores the how trademarks holder rights are affected by the virtual goods, NFTs and user generated content. It explores imitation and consumer confusion, consumer perception, enforcement of trademark rights, brand dilution in digital content, sponsorship and events in the metaverse , non fungible tokens, smart contracts and trademark enforcement, platform liability in decentralized environment and jurisdictional challenges in trademark infringement.

CHAPTER V: POTENTIAL CHALLENGES WITH RESPECT TO OTHER IPs (Industrial Designs, Patent, Geographical Indication & Trade Secrets) IN THE INTERSECTION OF THE METAVERSE

This chapter explores the challenges in other IPs such as Industrial Designs, Patent, Geographical Indications and Trade Secret. It provides how continuously traditional IP laws are under scrutiny and tested to find infringement in the virtual world. Different forms of potential infringements in patents and other IPs are discussed and analysed,

CHAPTER VI: CONCLUSION, FINDINGS, PROPOSED LEGAL REFORMS

This final chapter of the study provides the conclusion and the findings of how different traditional IPs laws are insufficient in todays time to address the challenges of infringement in virtual world. This chapter also provides proposed legal reforms which could be implemented by the international organization and other countries and further suggestions to combat the IP infringement and IP enforcement challenges in the Metaverse.

i. Limitation of the Study

This research primarily focus on the governance of intellectual property rights within the metaverse, with particular emphasis on copyright, trademark, and personality rights. The study also focus on identifying potential challenges arising in the metaverse in the realm of Intellectual Property, such as jurisdictional issues, enforcement issues, and issues related to digital forensics. At the end of this research, I proposed

innovative legal frameworks that effectively address these challenges. One of the major hindrances that this study is likely to incur due to lack of timely research is the identification of the current and potential challenges, and not the comprehensive legal framework to address such challenges. Separate research would suffice for drafting the legal framework. This research study may suffice to identify the current challenges and potential challenges related to the protection of rights and enforcement in the metaverse but may not suffice to get a detailed drafted comprehensive legal framework. The evolving nature of metaverse and absence of legal precedents are major challenges while conducting the research.

j. Mode of Citation

The study follows the OSCOLA Referencing for the style and formatting of various references and elements of this research work.

CHAPTER I: UNDERSTANDING THE CONCEPT OF THE METAVERSE IN THE CONTEXT OF IP LAWS

1.1. Understanding the Metaverse:

The Metaverse that is being referenced here is a garden of sophisticated, redeveloping digital universe that includes, amongst other things, virtual reality (VR), augmented reality (AR), blockchain, and ubiquitous persistently virtual environment spaces of great extent. While no universally accepted definition currently exists, common themes emphasize its persistent, immersive, three-dimensional (3D), and interactive nature, often populated by avatars and enabled by advanced technologies such as haptic devices and artificial intelligence (AI).

It can also be understood as a spatial computing platform enriched by the convergence of physical and virtual worlds facilitated by blockchain, augmented reality (AR), and virtual reality (VR) technologies. This convergence represents the next generation of the internet, which allows users to interact in the virtual world through avatars.⁴⁶ It becomes vital for digital, and it creates an enriching experience that blurs between the digital and physical. Among other features, the Metaverse consists of such things as video chats, distance learning, remote work, and multiplayer games, implying extensive and diverse applications. The integration of virtual reality and augmented reality tools within the metaverse provides a boost in the healthcare, entertainment, commercial, and gaming industries.⁴⁷

This is in order to transform the digital environment through 3D rendering, immersive platforms, decentralized governance (e.g., DAOs), and persistent economies of user-generated content that are based on IP law. They directly stare at the heart of what is legal: territoriality, authorship, and originality. Therefore, in order to understand the meaning of the emerging architectural alignment of the Metaverse with IP law, the endeavour must be interdisciplinary, interweaving technological architecture with jurisprudential evolution.⁴⁸

1.2. The Historical Evolution of the Metaverse

The Metaverse did not become overnight. It is covered by speculative fiction and early internet subcultures. In *Snow Crash* by Neal Stephenson (1992), a 3D digital reality, other than the physical world, was imagined.

⁴⁶ *Digital Marketing in Sports: Global Perspectives* (ROUTLEDGE 2025)

⁴⁷ Dutta PK, Doshi R and Sajani M, 1 (Adel Ben Youssef ed, 1st edn, CRC Press(Taylor & Francis Group) 2025)

⁴⁸ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

Then, Ernest Cline's Ready Player One embraced the idea of a highly immersive virtual world as the "OASIS".⁴⁹

Second Life and others like it in the 2000s allowed users to undertake proto-metaverse experiences, customizing avatars, owning virtual real estate, and spending virtual currency. In ways like Second Life, MMORPGs, like World of Warcraft and EVE Online, were expansive, user-driven economies and interactive storytelling environments.⁵⁰

The physical world did not cease to exist in the early metaverse platforms, but the early metaverse platforms had focused on escapism, and the metaverse platforms today have become more about integration, meaning a blurring of digital and physical life, commerce, and identity.

The COVID-19 pandemic proved to be an engine for fast digital transformation. At the same time as physical mobility decreased, people sought work, entertainment, and education on digital platforms. The virtual interaction almost removed the barriers and significantly accelerated interest in a persistent digital environment.⁵¹

At the same time, the birth of blockchain and NFTs paved the groundwork for the emergence of decentralized virtual economies where verifiable digital ownership becomes simultaneously possible. Against the central setup of Web2.0, the modern metaverse is now built in a Web3 way, and projects such as Decentraland, Sandbox, and Axie Infinity are the finest examples of the metaverse.⁵²

In incorporating blockchain technology, the Metaverses were opened up including The Sandbox and Decentraland. These are tools which let you sell virtual land, sell NFTs and also enable DAO governance. This evolution changed IP ownership, licensing and control of digital property to complexities.

1.3. Defining the Metaverse: -

The term "Metaverse" was first coined by Neal Stephenson in 1992 in his science fiction novel "Snow Crash".⁵³ He described the term as a virtual reality space where individuals interact within a computer-generated world through digital avatars. This virtual world is the metaverse. With time, the

⁴⁹ Shaikh AA, Mutanov G and Karjaluo H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

⁵⁰ *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

⁵¹ Sundaravadivazhagan B and others, *Applying Metaverse Technologies to Human-Computer Interaction for Healthcare* (CRC Press 2025)

⁵² Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

⁵³ Sundaravadivazhagan B and others, *Applying Metaverse Technologies to Human-Computer Interaction for Healthcare* (CRC Press 2025)

concept or term has grown and developed into an interconnected and bouncing digital world.⁵⁴

The term "metaverse" now describes a cohesive, persistent online environment where users can participate in various interactive activities, from socialising and business to entertainment and education. Its existence depends on the convergence of technologies, such as blockchain, artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and sophisticated network infrastructures like 5G.⁵⁵

The concept and scope of the metaverse have evolved, and the definition varies in different disciplines and institutions. At the same time, metaverse is often associated with the gaming and entertainment industries. It is evolving a wide range of functionalities such as social interaction, commerce, education, healthcare, and many more. Where such a large number of disciplines play a role, then automatically, Intellectual property comes into the frame. And to know and have in a formal and defined way the nature, the role, and the importance of it. The metaverse is diverse and different institutions have defined it differently. For example, Meta (formerly Facebook) views the Metaverse as a collective virtual space that encompasses augmented reality, virtual reality, and the Internet of Things, which enables users to experience diverse experiences.

As mentioned by World Intellectual Property Organization (WIPO), the Metaverse relates to the digital economies and virtual world, and will likely have a widespread impact on IP rights and the strategies of IP enforcement internationally. Since metaverse divergence and unclear definitions make it difficult to understand the platform, this also brings legal ambiguities in the application of the currently used but old traditional intellectual property framework. Generally it results in member ownership verification and rights enforcement problems.⁵⁶

1.4. Core features of Metaverse:-

1.4.1. Immersiveness and Presence:-

The virtual space continuously exists irrespective of individual user presence. Immersiveness in the Metaverse is about being physically present in non physical world. Through avatars, virtual and augmented reality users engage in sensory interaction with avatars that is close to the real world. This immersive presence causes the questions to emerge

⁵⁴ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

⁵⁵ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

⁵⁶ WIPO, 'Metaverse.' (*WIPO Knowledge Repository*, 2024) <<https://tind.wipo.int/record/49114?v=pdf>> accessed 15 March 2025

around the replication of IP protected environments like architectural design or branded locations.⁵⁷

1.4.2. Interoperability:-

Metaverse provides digital identities and assets can move seamlessly across multiple virtual platforms. The Metaverse is based on interoperability of digital assets and identify across different platforms. When it comes to interoperability, it deals with the licensing of digital assets such as NFTs and digital art as well. An increase in risk of unlicensed use occurs when a user can transport IP protected virtual fashion or in game assets between platforms.⁵⁸

1.4.3. Persistence (Real-time Continuity) :-

It allows simultaneous engagement among multiple users within shared virtual spaces. Whereas traditional software platform or games always come with an end, the Metaverse is an ongoing process to help the Metaverse, and it still works while the users don't log in. Virtually persistent environments make for continuous commercial, social and creative interaction that further complicates enforcement and monitoring of IP rights.⁵⁹

1.4.4. User-generated content (UGC):-

Users can create, buy, and sell virtual assets, frequently employing cryptocurrencies and non-fungible tokens (NFTs). User-generated content (UGC) lies at the core of the Metaverse. The creation of virtual environments happens through digital architecture and avatar modifications through the participation of users. When creating content collaboratively, especially such details as authorship, authorship(s), licencing, IP issues poses themselves.⁶⁰

1.4.5. Decentralization and Ownership Claims:-

By blockchain, users can claim ownership over digital assets without the need of a centralized platform, which within itself brings decentralization. This is good for digital autonomy but makes IP enforcement complicated given that smart contracts are running in different jurisdictions with no single intermediary.⁶¹

Legally, the term 'metaverse' remains somewhat ambiguous due to its rapidly evolving nature and lack of universally accepted definitions,

⁵⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

⁵⁸ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

⁵⁹ *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

⁶⁰ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

⁶¹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

presenting unique challenges for intellectual property laws and jurisdictional frameworks.

1.5. Technological Components of the Metaverse

Cuttingedge technologies contribute to the Metaverse immersive, decentralized and interactive capabilities and above all, it is the result of a combination of these. At the same time, these technologies also pose new challenges and opportunities on IP protection.

1.5.1.Virtual and Augmented Reality (VR/AR)

AR places the digital content on the physical world, while VR completely immerse the user in the digital 3D environment.⁶² They are the basis of sensory for the Metaverse, working together. As Chalmers explains, VR enables users to 'live' in an environment 'as if you existed within it,' a version of reality that shakes IP law by blurring the divide between the physical and digital and raises issues of the rights to digital reproductions of physical objects or performances.⁶³

1.5.2.Artificial Intelligence (AI)

The Metaverse has a LOT of AI ingredients that make synthetic reality possible, starting from natural language processing in avatars, to the automatically generated art, music, and architecture in an automated way.⁶⁴ These raise questions of authorship and copyright. However, in most jurisdictions, including the UK and EU, AI generated works are still legally uncertain, not least because a human author is still required for works to qualify for copyright protection.⁶⁵

Deployment of AI-generated content confuses moral rights, originality testing, and liability in the infringement case.⁶⁶

1.5.3.Blockchain and Smart Contracts

A lot of the metaverse platforms rely on the decentralized architecture, and as such they rely on blockchain technology that provides for secure ownership, identity verification and history of transactions. Since

⁶² Montgomery R and Montgomery A, *Place-Based Writing in Action: Opportunities for Authentic Writing in the World beyond the Classroom* (Routledge 2024)

⁶³ Jones S, Dawkins S and McDougall J, *Understanding Virtual Reality: Challenging Perspectives for Media Literacy and Education* (Routledge 2023)

⁶⁴ Ullah I, *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science: For Designers, Artists, Players, Non-Tech People and Everybody Else* (CRC Press 2024)

⁶⁵ Malik S, *Healthcare Services in the Metaverse: Game Theory, AI, IOT, and Blockchain* (CRC PRESS 2024)

⁶⁶ Mahapatra R, Bhattacharyya S and Nag A, *Intelligent Communication Networks: Research and Applications* (CRC Press 2024)

blockchain systems contain smart contracts within them to automate a licensing agreement and royalties, it may revolutionize IP enforcement.⁶⁷

Thus, without knowing it, you own a non fungible token (NFT) linked to a digital work, but in and of itself, owning a non fungible token linked to a digital work doesn't necessarily transfer copyright. Rosanna Brown and Parsheera outline that most NFTs actually serve as nothing more than digital certificates of authenticity, rather than IP licenses, and as a result a technological capability often exists without recognition in law, opening up uncertainty and in some cases exploitation without permission.⁶⁸

1.5.4. Non-Fungible Tokens (NFTs)

As far as the IP is concerned, NFTs are one of the most controversial metaverse components. The MetaBirkins case—Hermès International v. Rothschild—illustrates the tension between artistic freedom and trademark protection. A court in this case sided with Hermès after an artist launched NFTs that harbored resemblance of Hermès' famed Birkin bags without authorization, even when the artist themselves were aware of the breach of no license taken. It established that even digital renderings could infringe trademark rights.⁶⁹

It also presents challenges related to derivatives works, resale royalties, as well as authenticity verification for NFTs. However, since smart licenses require a framework for standardization, IP holders lack true protection for their license and lose out on income in the secondary market.⁷⁰

1.5.5. 5G and Edge Computing

5G and edge computing allow the Metaverse to be immersive and real time because 5G and edge computing provides all the high speed low latency infrastructure needed for trying it out. Based on these technologies, we have access to the digital environments and content instantly, with continuous IP use and reproduction across the jurisdictions.⁷¹ First, it complicates takedown procedures across borders, and second, puts better enforcement out of reach, since any takedown, no

⁶⁷ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

⁶⁸ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

⁶⁹ Mach M, *Crypto Millionaires: Blockchain: A Chance for All?* (CRC Press, Taylor & Francis Group 2025)

⁷⁰ Khan J and Belk RW, *Digital Currency and Consumption: The Meaning of Money in an Era of Digital Currency* (Routledge 2025)

⁷¹ Dohler M, Lopez DR and Wang C, *Blockchains in 6G: A Standardized Approach to Permissioned Distributed Ledgers* (River Publishers 2024)

matter how minor, has to be manual and manual enforcement procedures are more difficult to enforce and to magnify.⁷²

1.6. Jurisdiction and Enforcement in Virtual Worlds

"There is nothing that is conventional about IP enforcement in the Metaverse, because the Metaverse is, by its nature, borderless." Due to the hybridity of their movement, platforms, servers, and users are often spread over many legal territories and thus undergo intense jurisdictional conflict.

In the absence of borders or the governing jurisdictions, as is the case with decentralized platforms running on DAOs or blockchain-based marketplaces, there is no centralized operator to detain in enforcing.⁷³

Moreover, anonymity and pseudonymity make it harder for enforcement. However, while real world identities are masked in the platforms, IP owners have a hard time finding and even suing infringers. In such decentralized ecosystems, there may be no traditional remedies like injunctions, damages, and even takedown requests as they have proven to be ineffective.

But there are still new technological approaches that rely on blockchain based IP registries or on AI powered content scanning, or smart takedown, but which are not yet widely used.⁷⁴

1.7. Governing Structure of the Metaverse

As of now, the metaverse works on a very complex governance landscape, which includes centralized and other decentralized natures. And both lack a centralized governing body. In the absence of a governing body, it shows a potential challenge, which may be in enforcing intellectual property rights, particularly in terms of trademark, copyright, and other intellectual property rights. The absence of a harmonized or unified legal framework leads to IP infringement and complicates governance and enforcement for IP protection.⁷⁵

1.7.1. Centralized Governance Models:-

The primary type of governance in such platforms (Meta's Horizon Worlds / Roblox / Fortnite, to name a couple) is handled through internal corporate

⁷² Connock A, *Media Management and Artificial Intelligence: Understanding Media Business Models in the Digital Age* (Routledge 2023)

⁷³ Shaikh AA, Mutanov G and Karjaluo H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

⁷⁴ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

⁷⁵ Mousa Al-Kfairy, Saef Alrabaaee, and Omar Alfandi, "Navigating the Ethical Landscape of Metaverse: Challenges, Solutions and Governance Initiatives" (2025)

<<https://papers.ssrn.com/sol3/Delivery.cfm/4447c0eb-799d-4d1b-82e0-d60f88ce8c71-MECA.pdf?abstractid=5080379&mirid=1>> accessed 3 January 2025

compliance, defined by Terms of Service (ToS) or End Users License Agreement (EULA). These are quasi legal documents setting the rules to user behavior, content ownership, as well as data usage. But they are typically single sidedly drafted and updated which precludes users the right to contribute in defining the rules under which their creations and interactions take place.⁷⁶

Because of this, IP protection is difficult under such centralized governance structures. Although there are platforms on which one can report and remove infringing content, enforcement is opaque, reactive, and inconsistent.⁷⁷ A huge amount of times the IP rights of creators are subordinated to platform commercial priorities, and creators would be exploited or misused of their works with little or no legal recourse, and without any procedural transparency.⁷⁸

1.7.2. Decentralized Governance and DAOs

From blockchain protocols and smart contracts, decentralized metaverses, or the Decentralands, the The Sandbox, and the CryptoVoxels, rely on them to perform and manage governance. Centrally organized, many are worked by Decentralized Autonomous Organizations (DAOs), where governance is made democratically among token holders and decide proposals on content moderation to treasury assignment.⁷⁹

There are decent argument for having a DAO model of governance, yet major problems with accountability and IP enforcement. There is no oversight to determine how disputes regarding copyright infringement or commercial use of trademarked content will be resolved without at least one central entity adjudicating. In many jurisdictions, DAOs have legal personality or at least third-party rights, but not full legal personality. As such, litigation and cross border claims are not straightforward.⁸⁰

Moreover, smart contracts make automatic licensing and transaction possible, but not always following the requirements for enforceable contracts. The license clauses can be poor and unclear and may not even have them, leaving IP ownership, attribution or transfer open to grey areas.⁸¹

⁷⁶ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

⁷⁷ Salisbury M, *Leadership in the Era of AI: How to Grow Organizational Intelligence* (Routledge, Taylor & Francis Group 2025)

⁷⁸ Ben-Yosef A, *Capitalizing Your Technology to Disrupt and Dominate Your Markets: Transforming Cost Centers to Innovation Centers* (Routledge 2023)

⁷⁹ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

⁸⁰ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

⁸¹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

1.7.3. Hybrid and Experimental Governance Models

There are more platforms experimenting with hybrid platforms that use blockchain for asset verification and transactions, but moderated and rule enforcement is still under the centralized control. However, this can achieve efficiency and some degree of decentralization in a way that could create overlapping or competing governance standards that are hostile to the enforcement of IP rights and those of users.⁸²

Suddenly, the infrastructure platform is growing and the virtual economy within is developing, and governance mechanisms will also play a more important role in how IP is licensed, shared, and protected.⁸³ For instance, if a DAO does not take action against infringing content within its ecosystem IP holders may have no recourse to redress. It undermines the creation incentives of Metaverse and risk the destabilizing its digital economy.⁸⁴

The fact that there is no centralized or harmonized governance structure is of crucial importance to the provision of certainty in the legal sphere, in particular, with respect to IP rights. Immersive and persistent digital environments do not present International instruments such as TRIPS or the Berne Convention with much guidance. More and more, government and legal scholars are asserting that multistakeholder governance frameworks will have to be built to fill the gaps.⁸⁵

So, while the concepts of interoperability, ethical standards and jurisdictionally neutral dispute resolution and IP enforcement is a considerable challenge, organizations like WIPO, WTO, or soon a Metaverse Standards Forum could facilitate, promote and implement some of this. Until such governance measures are developed, there will be no robust, scalable and equitable IP protection in the fragmented governance of the Metaverse.

1.8. Conclusion

In this chapter, the scope Metaverse has been explored as a step towards the usage Metaverse as an intricate and distinctive digital environment leaping to the union of the actual and virtual spaces. Starting with its apparition from the speculative fiction to its materialisation with networks based on immersive technologies, blockchain, artificial intelligence, virtual

⁸² Pilon RV, *Artificial Intelligence in Commercial Aviation: Use Cases and Emerging Strategies* (Routledge, Taylor & Francis Group 2024)

⁸³ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

⁸⁴ Shaikh AA, Mutanov G and Karjaluo H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

⁸⁵ Tang A, *Safeguarding the Future: Security and Privacy by Design for AI, Metaverse, Blockchain, and Beyond* (CRC Press 2025)

reality and augmented reality, and on a networked economy, the Metaverse is today a multidimensional space.

Using a granular evaluation of its two technology pillars—NFTs, smart contracts, or AI-generated content, among the other pillars of the Metaverse—it has been demonstrated how this technology enables new ways of identity, interaction and the ownership of the digital. However, these very same innovations disrupt somewhat the categories of law by redefining authorship and changing ownership claims, as well as enforcement mechanisms. On the one hand, as a result of virtual environments being globally persistent and across jurisdictions, jurisdictional ambiguity is furthered and legal certainty is weakened by their being devoid of centralized governance.

The chapter mapped the governance models (centralized control to DAO based) and pointed out that existing systems are not well equipped to mediate disputes, manage platforms and rights of user in a coordinated manner. It also suggests the legal fragmentation that is the case in platforms and across jurisdictions, although hybrid governance systems emerge.

This chapter constructs the base of the doctrinal and regulatory analysis by developing a clear understanding of the architecture and functioning of the Metaverse as a socio-legal challenge and the operational logic. It shows the need for reassessing the traditional legal conceptions and opens the area for consideration of what legal reform, international cooperation, and technological synergy can do to ensure stability, equity, and protection of the shaping digital frontier.

CHAPTER II: POTENTIAL CHALLENGES WITH RESPECT TO IP LAW IMPLEMENTATION IN METAVERSE

2.1. Introduction:-

One of the most important fronts of intellectual property and the law today concerns the intersection of the two. The more virtual environments come to entail and support our social interaction, our commerce, and our creativity, the more in need we are of a comprehension of how they impact IP law. Because it combines the IoT, AR, VR, XR and 3D technologies into a metaverse, the legal issues have no borders and merge the physical and virtual worlds. This aspect of intellectual property law calls for exploration of several IP domains alongside their manifestations in such a new context.⁸⁶

2.2. The Evolution of Intellectual Property Law

The development in intellectual property (IP) law is grounded in the developments of the needs of societies and technology. The IP rights have been historically created to protect the creators and their creations, to assure them recognition and to give them the monopolistic control of their creations during a specific period. Because creation and dissemination in such contexts as in the digital realm are inherently shifting, this protection has inherently adapted to confer protection to as a matter of course to new forms of innovation and technology as they arise. Current frameworks of IP law have a number of historical precedents that tell us something very important about the relationship between digital environments and IP law. Digital Technology and the Internet come in with a force that makes it necessary to reexamine existing laws in a way that they are able to keep up with unforeseen challenges and opportunities.⁸⁷

The fact that in the early 18th century the right of copyright is established, particularly by the Statute of Anne of 1710 in England, marks one of the important stages in the development of the IP law. Incorporating this legal framework was aiming to protect the authors' rights and motivate the creativity, which is the foundation of the modern copyright systems. This is how over the years nations began enacting similar legislative rules such as the Berne Convention for the Protection of Literary and Artistic Works established in 1886, that shaped the worldwide notion of copyright. More than that, they served as a reminder that during such a fast-propelling modern world, it was necessary to protect the creations of our society. But

⁸⁶ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

⁸⁷ KONGOLO T, *Intellectual Property Branding in the Developing World: A New Approach to Non-Technological... Innovations* (ROUTLEDGE 2021)

with the evolution of technology fast paced as it was, with the advent of the digital revolution, the existing IP laws couldn't help but lag behind, thus setting a scenario where the laws, too, had started adapting to ultramodern complexities in their own way to meet with the growing needs of emerging technologies.⁸⁸

With the rise of new technologies such as the internet and more recently the Metaverse the IP law has had to respond on an ongoing basis to the changing of creation and distribution. This internet revolution smoothed the way into new streams of information and creative works and made enforcement of copyright and trademark just as complicated. Same with peer to peer sharing & replication digital content: old notions of ownership and creativity have been jostled by the reality of the digital economy, and the effectiveness of old protections under IP, became an issue on the table of time.⁸⁹ The technological changes have often moved at an even more assaultive tempo than the legislative, so that protection in the various jurisdictions and in the differing parts of creativity are inconsistent at times.⁹⁰

Also, with the arrival of user produced material, IP laws became more difficult to understand. In the case of Metaverse, where users create and contribute to digital environments actively, the question is related to ownership and rights in relation to contributions. The Metaverse lifestyle in fact requires a different legal approach because of the particularities inherent in this space, taking into account that the creation and distribution of content in these spaces is essentially collaborative. However, the Metaverse brings with it unique attributes that require new legislation that relates to intellectual property rights, for instance to users created content and virtual assets. Such a call for innovation is consistent with an increasing majority of scholars and practitioners who argue that traditional IP frameworks might not be appropriate for use in dealing with the complexities of immersive, interactive environments.⁹¹

IP law is always developed in the school of adaptation to new technological development. For example, when film, radio, and television came about, copyright laws were adjusted to cater for new methods of delivery of the same content.⁹² Like digital distribution models such as streaming services, which have become more extensive, modern lawmakers have had to reconsider the application of copyright, namely, with regard to

⁸⁸ LAMBERT J, *Enforcing Intellectual Property Rights: A Concise Guide for Businesses, Innovative and Creative... Individuals* (ROUTLEDGE 2024)

⁸⁹ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

⁹⁰ Dohler M, Lopez DR and Wang C, *Blockchains in 6G: A Standardized Approach to Permissioned Distributed Ledgers* (River Publishers 2024)

⁹¹ Steven Wilf, *Intellectual Property Law and History* (Routledge)

⁹² Ben-Yosef A, *Capitalizing Your Technology to Disrupt and Dominate Your Markets: Transforming Cost Centers to Innovation Centers* (Routledge 2023)

licensing and access rights. In car interior parts, fasteners make up about 20% of the body weight.⁹³

Additionally, the IP law has not been cognizant to the imperative matters of the Metaverse, as the law has not responded swiftly to the urgent issues of the world coming to light with the Metaverse in a borderless digital society.⁹⁴ As the Metaverse being one that is decentralized, this is characterized with user anonymity and global participation, It becomes difficult to bring entities to book for violating IP. The Agreement on Trade Regulations pertaining to Intellectual Property Rights (TRIPS), for instance, and the Paris Convention do not adequately address IP issues arising from the digital and virtual spaces. Such inadequacy highlights the necessity to adopt convergent approaches to protect while allowing innovation in various international arenas.⁹⁵

It is one big adaptation store that can be used to show that the capacity of not only adapting to a known situation is there. However, platforms in the digital environment such as collaborative and community based expose us to a fundamentally different way of working, making 'ownership' and 'control' of one's work (work product) moot. Non fungible token or NFTs have opened up new doors for IP protection, introducing interim solutions to overlap rights and claims. Traditionally an applicant has to wait for the government to assert formal protection over his or her IP, but the advent of NFTs can offer such protection during the period. In so doing, this implies on ways of reaching the gap between established IP norms and new technologies that disrupt creative production and distribution.⁹⁶

IP law is always developed in the school of adaptation to new technological development. For example; with the advent of film, radio, and television came into being copyright laws that accommodated for new media of content delivery. Just as digital distribution models like streaming services have set in motion asking lawmakers how copyright is applied, and specifically, how copyright licensing and access rights. Newspapers, television documentaries and films, fair use in developing countries, fair use in education, fair use in scientific and government research, fair use in creative expression, copyright term extensions, copyright terms, piracy, and use of orphan works are often the subject of IP law debates for balancing the need for broad access to cultural works and creator's rights.

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⁹³ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

⁹⁴ Steven Wilf, *Intellectual Property Law and History* (Routledge)

⁹⁵ Adele AO, *The Political Economy of the TRIPS Agreement: Origins and History of Negotiations* (Acts Press 2001)

⁹⁶ Macmillan F, *Intellectual and Cultural Property: Between Market and Community* (Routledge, Taylor & Francis Group 2021)

⁹⁷ Oguamanam C, *Intellectual Property in Global Governance a Development Question* (SSRN 2016)

Additionally, the IP law has not been cognizant to the imperative matters of the Metaverse, as the law has not responded swiftly to the urgent issues of the world coming to light with the Metaverse in a borderless digital society. As the Metaverse being one that is decentralized, this is characterized with user anonymity and global participation.⁹⁸ It becomes difficult to bring entities to book for violating IP. The Agreement on Trade Regulations pertaining to Intellectual Property Rights (TRIPS), for instance, and the Paris Convention do not adequately address IP issues arising from the digital and virtual spaces. Such inadequacy highlights the necessity to adopt convergent approaches to protect while allowing innovation in various international arenas.

Background of IP law gives attention to its capacity for adaptation, while at the same time illustrating the legacies embedded in it which tend to hinder progress. Based on the predominance of the outcomes around ownership and control in traditional frameworks that are currently in conflict with the collaborative and community based models of digital environments. Non fungible token or NFTs have opened up new doors for IP protection, introducing interim solutions to overlap rights and claims. Traditionally an applicant has to wait for the government to assert formal protection over his or her IP, but the advent of NFTs can offer such protection during [the] period. In so doing, this implies on ways of reaching the gap between established IP norms and new technologies that disrupt creative production and distribution.⁹⁹

2.3. Challenges in IP Law Implementation:-

There is a multi layered challenge regarding the evolution of the Metaverse with respect to intellectual property (IP) law. Since virtual environments are often evolving faster than the relevant current legal frameworks built for other domains, traditional attempts at incorporating legal frameworks into virtual environments can be difficult. Understanding the distinct characteristics of the Metaverse is the key to unlock the complication of this brand new digital landscape, especially on trademark, copyright and industrial design right.¹⁰⁰

2.3.1. Trade Marks

One prominent challenge relates to the unauthorized use of registered trademarks within the Metaverse. In traditional settings, trademark laws provide clear protections for brand identities. However, the virtual nature of the Metaverse complicates enforcement. The unauthorized use of

⁹⁸ Dutta PK, Doshi R and Sajjani M, 1 (Adel Ben Youssef ed, 1st edn, CRC Press(Taylor & Francis Group) 2025)

⁹⁹ Reingand N, Intellectual Property in Academia: A Practical Guide for Scientists and Engineers (CRC Press LLC Taylor & Francis Group distributor 2017)

¹⁰⁰ WIPO, 'Metaverse.' (WIPO Knowledge Repository, 2024)

<<https://tind.wipo.int/record/49114?v=pdf>> accessed 15 March 2025

trademarks can occur in ways that are less visible than in physical markets, leading to concerns over dilution and confusion among consumer. For instance the unauthorized use of famous brand elements in metaverse products constitutes a brand violation, similar to those in the real world. This highlights an urgent need for adaptive laws that can combat brand infringements in this unique context.¹⁰¹

2.3.2. Copyright

The Metaverse presents the trademark issue as well as other questions related to copyright law about user generated content. There is a complex web of ownership claim generated by users who can create and distribute their works. However, where contributions are formed from many actors' efforts not necessarily as authors or originators of something unique, rights allocation become more convoluted in this environment, as many can be part of the same contribution.¹⁰² Due to the unique challenges related to the metaverse products, current copyright law should be adapted to suit the changes. existing laws are not strict enough and if anything is applied they are stifling innovation. Existing frameworks for copyright on account of their lack of fit for modern challenges with user interactions and contributions is inherently an intricate job requiring interesting and complex workarounds.¹⁰³

On top of copyright law, the particular ambiguity of ownership of AI generated content is a particularly concerning thing. The line between what is man-made versus what has been made artificial is blurring, and as creators are using artificial intelligence to create novels works, determining authorship of those works has become legally ambiguous. Not only may the ownership rights not rest in the hands of identifiable individuals, but they necessarily rearticulate the definition of rights given the speed with which these matrices of digitality are changing. In addition, user anonymity further compounds this issue in these environments as IP rights holders are unable to locate and take action against the infringers.¹⁰⁴

2.3.3. Decentralized Autonomous Organization (DAOs)

Meanwhile, the challenge of enforcement of IP rights comes also with role of decentralized autonomous organizations (DAOs). It is possible that DAOs enable fungible collective management and governance of assets, including IP, often making it difficult to assign liability for IP infringement. This ambiguity can erode the assumptions that most knowingly recognize

¹⁰¹ Shaikh AA, Mutanov G and Karjaluoto H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

¹⁰² Steven Wilf, *Intellectual Property Law and History* (Routledge)

¹⁰³ Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹⁰⁴ Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

as the basis for traditional legal constructs, assigning responsibility to (or any other predicate) to something, or someone. It is crucial to understand how DAOs work with the Metaverse to understand liability from IP rights.¹⁰⁵

2.3.4. Industrial Designs:-

Digital design is a challenge to the protectability of Industrial design rights in the Metaverse. The fact that digital fashions and virtual spaces are becoming so popular gives rise to the necessity to consider the classification of these new entities under the laws of industrial design.¹⁰⁶

Under current frameworks, many digital products may successfully pass the originality test but will not receive adequate protection unless they are physical manifestations subject to troubles of fixation or enforceability.¹⁰⁷

2.3.5. Geographical Indications

Even virtual realms are rather difficult to enforce in the case of geographical indications. The digital mode facilitates easy alteration and misrepresentation failing in the preservation of the kind of authenticity linked with geographical indicators.¹⁰⁸ This, of course, raises fundamental questions regarding the kind of legal means to protect such indications from misuse, as well as the potential enforcement thereof in a borderless environment influencing the Metaverse.¹⁰⁹

2.3.6. Patents

All these make cross jurisdictional enforcement of patent rights even more difficult in the borderless nature of Metaverse. The protection of flexibly dispatched innovations is distinctly complex due to confinement of existing legal frameworks to territorial bounds. The Metaverse may have new innovations, which may not settle easily to the already established categories of things that are patentable, which thus opens up important questions on how the patchwork of patent law should be tweaked to cater to new concerns.¹¹⁰

The other important aspect influencing implementation of IP law in the Metaverse is the potential role of smart contracts in the process of licensing and enforcement of IP rights. IP transactions can be automated through the use of smart contract with promised efficiency of enforcement. Nevertheless, there are significant clarifications concerning their legality

¹⁰⁵ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁰⁶ Howell C and Bainbridge DI, *Intellectual Property Asset Management: How to Identify, Protect, Manage and Exploit Intellectual Property within the Business Environment* (Routledge 2014)

¹⁰⁷ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁰⁸ Fink C and Maskus KE, *Intellectual Property and Development: Lessons from Recent Economic Research* (World Bank 2005)

¹⁰⁹ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹¹⁰ Sundaravadivazhagan B and others, *Applying Metaverse Technologies to Human-Computer Interaction for Healthcare* (CRC Press 2025)

and enforceability but in a decentralized context. 'Smart contracts are a new form of law and technology, affecting the law of contracts, dispute resolution, and the range of public and private power.' However, these opportunities must be struck carefully in terms of balance with the legal uncertainties that they introduce.¹¹¹

When looking at these different challenges, it is clear that mainstream frameworks are usually not equipped to tackle the specific situations raised by the concurrent of IP law and the Metaverse. These complexities need to be addressed through legal and regulatory reform and such reforms need be planned carefully. Traditional legal practice finds itself at a hurdle created by the existence of decentralized immersive environments, and they will become inimical to IP law. This should be an adaptive mechanism that would protect the intellectual property rights in a manner robust enough to enable innovation and creativity in an emergent digital landscape of the Metaverse known as the Metaverse.¹¹²

2.4. Conclusion:-

The Metaverse initiative demands a complete replacement of traditional IP law models because it established a new decentralized digital environment where users take control. The Metaverse while combining physical and digital realms creates ownership challenges and introduces new creativity channels enabled by artificial intelligence technology and DAO and NFT mechanisms. Guest articles entail a struggle for both trademark protection and copyright law as well as difficulties facing patent and industrial design rights due to enforcement limitations. The legal requirements connected to both geographical indications and smart contracts in licensing show why innovative approaches to law are absolutely necessary right now. The territoriality-based IP framework along with its requirements for physical manifestations and specific author determination totally fails to control the Metaverse's interactive dynamics. The historical IP treaties known as TRIPS and Paris Convention demonstrate insufficient capabilities to resolve contemporary difficulties in digital co-creation operations and anonymous governance systems.

Learning from existing laws is not enough for digital intellectual property protection because we need to redefine this concept in modern times. A future-proof IP system requires the creation of framework standards between jurisdictions together with digital authorship understanding and blockchain and smart contracts integration and international condemnation of virtual domain protection rules. The Metaverse presents

¹¹¹ Rushing FW, *Intellectual Property Rights in Science, Technology, and Economic Performance International Comparisons* (Routledge 2022)

¹¹² Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

both a need for protecting innovation and a requirement to develop revolutionary methods of protection. Law should become a leader in establishing digital rights rather than merely responding to changing technology since it needs to build the virtual future hand in hand with creativity protection. This virtual realm extends beyond a mere new domain since it represents an entirely novel existence. A new intellectual property law framework demands establishment along with this emerging reality.

CHAPTER III: POTENTIAL CHALLENGES WITH RESPECT TO COPYRIGHT IN THE INTERSECTION OF THE METAVERSE

3.1. Introduction:-

The law of copyright in the Metaverse intertwines a technology of unprecedented scale and the parallel laws aimed at protecting the creative works within. At the same time that immersive digital spaces are becoming more widespread, more challenges arise to traditional notions of authorship, ownership, and originality. The nature of these environments is dynamic and interactive, leading to a critique of current copyright frameworks. The problem is that what has become a force of AI-generated content is a significant issue.¹¹³ The law of copyright is muddled by questions on who owns the copyright for works produced by AI. It may be that the essence of authorship is no longer restricted to discernable individuals, but may in fact be extended to systems of artificial intelligence that create content independently. Situations under which it is unclear who the copyright owner is, however, leave current copyright law making decisions about how to assign ownership without losing the incentives to innovate.¹¹⁴

3.2. Challenges:-

3.2.1. Nature of the Copyright

For several reasons, the traditional requirement of fixation has proved to be one of the challenges in copyright law, requiring that a work must be physically represented in order to be protected. This requirement is complicated by the Metaverse, characterized by real time experiences and transient interacting with the digital.¹¹⁵ Works can exist entirely only in digital format with no physical manifestation whatsoever, but are continuously reworked and reworked by users. It is a threat to the principle of originality and fixation. That the Metaverse blurs the line along which authorship and ownership demarcate, forces a reconsideration of the adequacy of copyright law for addressing such contemporary challenges.¹¹⁶

¹¹³ Pilon RV, *Artificial Intelligence in Commercial Aviation: Use Cases and Emerging Strategies* (Routledge, Taylor & Francis Group 2024)

¹¹⁴ Connock A, *Media Management and Artificial Intelligence: Understanding Media Business Models in the Digital Age* (Routledge 2023)

¹¹⁵ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

¹¹⁶ Ullah I, *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science: For Designers, Artists, Players, Non-Tech People and Everybody Else* (CRC Press 2024)

3.2.2. Smart Contracts

Attention should also be paid to the implications of smart contracts. Bronin suggests that blockchain technology, such as these self-executing contracts, provide a new opportunity for licensing and enforcing copyright in the Metaverse.¹¹⁷ Such environments provide them a potential solution in terms of a way to track ownership and ensure compliance with content easily replicable or modified.¹¹⁸ Nevertheless, with such a broad application, it is necessary to make some essential clarifications about legal status and enforceability of smart contracts in decentralized contexts. There is nothing understated about transformative potential of blockchain technology, according to one study. These innovations may have vastly altered the way creators have dealt with their rights and interacted with their audiences.¹¹⁹

3.2.3. Remedy of Copyright Infringement:-

Another intricate problem is tracking and remedying of copyright infringement in decentralized environments. The enforcement of copyright laws is complicated in the Metaverse because of its ease with which digital content can be copied and disseminated. Since responsibility is often poorly defined, it often becomes more difficult to identify infringers and seek redress from overseas correctives for right holders. Because content is replicated and remixed faster than traditional enforcement mechanisms are able to respond, there is a need for innovative solutions and reform of the law. The lack of protecting IP in 3D printing is because current methods for protecting IP are not adequate with copyable digital designs and falsely tracing the source of offending products. Therefore, to ensure that creators can protect their works new paradigms of enforcement that are tailored to the Metaverse, are important.¹²⁰

3.2.4. Criteria of Copyright

In this context, the applying criteria for the protective digital designs in the Metaverse also need careful consideration. As digital creations proliferate, it is becoming ever more important to understand how these creations line up with existing rights in copyright and industrial design legal frameworks.

¹¹⁷ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

¹¹⁸ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹¹⁹ Dohler M, Lopez DR and Wang C, *Blockchains in 6G: A Standardized Approach to Permissioned Distributed Ledgers* (River Publishers 2024)

¹²⁰ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹²¹Much of this depends on how to define what is originality and whether digital products that may fulfil these standards are thwarted in their protection by existing legal frameworks. ¹²²However, since the designs are digital, and fluid, trying to determine who owns something or whether a design is infringing is more difficult as traditional laws were not designed to deal with such claims.¹²³

3.2.5. Convergence of Intellectual Property:-

Furthermore, these provide another level of complexity due to the convergence of copyright and trademark rights in the area of virtual goods.

¹²⁴The issue is that legal frameworks need to adapt to the situation of having overlapping rights to that same branded digital assets found within the metaverse environment.¹²⁵ As for geographical indications, its protection is also quite unique. But the digital terrain allows easy context and presentation distortions that make the enforcement of what this kind of indicator/indicators signifies complicated. Protecting geographical indications in the Metaverse's virtual landscape requires a different way of using the law to ensure legal measures to achieve that are in place.

3.2.6. User Generated Content:-

Adding to enforcement of copyright laws, the issue of the new cooperative user generated economies complicates matters more. In these environments where people generate and make money from content without restrictions and boundaries, disputes over ownership is very easy. Often in these spaces, collaboration in creation leads to right allocations that are complex. This is thus not a suitable environment for existing frameworks to operate in. This in that, digital environments are explicitly intent on remixing and reuse, clarifications about user rights and creator protections.¹²⁶

3.2.7. Decentralized Autonomous Organization (DAOs)

Second, copyright ownership and enforcement within the Metaverse implies further complexity when considering the decentralized nature of companies in the Metaverse known as Autonomous Organizations

¹²¹ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹²² Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹²³ Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹²⁴ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹²⁵ Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹²⁶ Pilon RV, *Artificial Intelligence in Commercial Aviation: Use Cases and Emerging Strategies* (Routledge, Taylor & Francis Group 2024)

(DAOs).¹²⁷ DAOs circulate in governance structures that do not fit in conventional liability structures. In decentralized spaces, as the roles of creators and users join together, it is essential to understand how rights are distributed and preserved for the creators in new ways to safeguard creators contributions.¹²⁸

3.2.8. Authorship and Ownership of AI-Generated Content:-

As the Metaverse evolves, the tool of artificial intelligence (AI) as a creative input carries with it some complex ideas about authorship and ownership of what's created. In contrast to traditional forms of creative process, where the human author is identifiable, AI generated content gives rise to questions about who legally owns and authorship of such creations. Complicating this all further is the fact that there exist existing intellectual property frameworks that were designed around a very different era and one in which human creators are the focal point. In the case of AI systems creating ideas and materials autonomously, the parameters of copyright law must once more be rethought.¹²⁹

The most pressing concern is how existing copyright laws handle works created by machine intelligence rather than human copyright holders. In traditional copyright systems, authorship is the essential requirement that iffy creators receive legal rights.¹³⁰ However, with AI outputted content without human intervention, the traditional concepts relevant to authorial intent and uniqueness are called into question. This casus raises the most critical question of why is it that creativity in the digital age differs from creativity in the past and how legal systems are supposed to adapt to this fundamental change.¹³¹

As content creators engage in the augmented capabilities of AI systems to employ the power of AI to strengthen their own artistic capabilities, it becomes more and more complex to navigate the increasingly collaborative and crowded environments of the Metaverse. Because ownership rights for AI generated content are essentially contested, it paradoxically resides with the owner of the AI system and/or the owner of the AI who used it.¹³² There are some scholars, who suggest relook at how

¹²⁷ Tang A, *Safeguarding the Future: Security and Privacy by Design for AI, Metaverse, Blockchain, and Beyond* (CRC Press 2025)

¹²⁸ Shaikh AA, Mutanov G and Karjaluo H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

¹²⁹ Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

¹³⁰ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹³¹ Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹³² Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

copyright law can be amended to accommodate the changing creative landscape in general, with a particular emphasis on demarcation of rights among various stakeholders in AI generated works. The urgency of these reforms is underscored by innovative technological advancements that disrupt long-standing legal paradigms, highlighting the inadequacy of existing laws.¹³³

It is indeed, the very transient and dynamic nature of digital creations created for the Metaverse poses threats to the need for fixation that supports traditional copyright protection. This principle normally states that a copyrightable work must be embodied in a tangible form. Nonetheless, clear Metaverse is fluid creations that can evolve swiftly when interacting with users. If traditional models presupposing a concrete form of legal recognition need to be deviated from, there arises a need for the adoption of effective models in responding to these peculiar digital characteristics. The latest protection measures for IP in 3D printing are lacking as digital design copying is so easy and tracking down the source of infringing products is so challenging.¹³⁴

In addition, through decentralized autonomous organizations (DAOs), there is a new governance approach that makes assigning liability for infringement for content generated by AI more difficult.¹³⁵ The governance of intellectual property in DAOs gets distributed among participants rather than centralized in a single entity, leading to ambiguities of who responsible will be for infringements in collective decision making.¹³⁶ A delimitation of liability threatens the right enforcement and punishing of violators in such a decentralised context. Finally, this deepening calls for a strong and thoughtful analysis of how legal grounds can adapt to these realities in the Metaverse to advance accountability while encouraging affirmative creativity.

Furthermore, the rights and obligations pertaining to licensing these works created by AI is yet to be defined. Creators and developers alike have to work in environments that are complex and the parameters that surround permissions and usage can change quickly. There is this complexity that can kind of stall the innovative processes because people are not clear whether it is a bargain agreement or an operational framework.¹³⁷ For this reason, an articulated system of licensing is required to permit that

¹³³ Ullah I, *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science: For Designers, Artists, Players, Non-Tech People and Everybody Else* (CRC Press 2024)

¹³⁴ Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

¹³⁵ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹³⁶ Ullah I, *Future Communication Systems Using Artificial Intelligence, Internet of Things and Data Science: For Designers, Artists, Players, Non-Tech People and Everybody Else* (CRC Press 2024)

¹³⁷ Connock A, *Media Management and Artificial Intelligence: Understanding Media Business Models in the Digital Age* (Routledge 2023)

creators are in a position to advantageously exploit AI instruments and guard their contributions from potential infringement or exploitation at the same time.

By reviewing the potential use of blockchain and smart contracts as a means to better enforce the rights that accompany AI generated content, this essay proposes that blockchain and smart contracts, in some cases, can improve the rights associated with AI generated content.¹³⁸ The immutability and decentralization of existing digital rights identification platforms is superior to traditional ones when it comes to protecting IP rights. These technologies are meant to make it possible for there to be effective measures of ownership and the spreading of digital assets while also being clear about who is delegated to rights. Since the Metaverse is a potentially new and broad audience, creators could integrate smart contracts, mechanizing attempted licensing agreements, and thereby gaining better protection against the unauthorized use of their works.¹³⁹

Given the change of AI and the evolvement of the Metaverse leading to new paradigms of content deployment, the interaction of AI and intellectual property law will be in need of vigilant scrutiny.¹⁴⁰ These discussions should not end with reactive adaptation of the law that already exists, but rather, they should be built to create better (proactive) means of meaningfully foster creativity and innovation. As technological advancements evolve so must the legal frameworks regarding authorship and ownership of AI-generated content; they should promote both creators' rights and the public interest in a vibrant, open, and dynamic creative environment.¹⁴¹

Authorship and ownership of AI generated content in the Metaverse is an area of intellectual property law that has very complex workings. In the absence of traditional frameworks capable of insane tailoring to the challenges of digital creation and artificial intelligence's intervention, a concrete attempt must be made to cut away a balanced, practicable way to (and) sustain artistic expression and separate without diminishing the value of intellectual property rights for the creators.¹⁴²

¹³⁸ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

¹³⁹ Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

¹⁴⁰ Breakey H, *Intellectual Liberty: Natural Rights and Intellectual Property* (Routledge 2016)

¹⁴¹ Atkinson BAC and Fitzgerald BF, *Copyright Law. Volume 3, Copyright in the 21st Century* (Routledge, Taylor & Francis Group 2016)

¹⁴² Lombardi EM, *Digitization, Copyright and the Law: Copyleft and the Future of Intellectual Property* (Taylor and Francis Group 2024)

3.3. Conclusion

The ongoing Metaverse transformation to the landscape of intellectual property (IP) law is monumental. However, the complexity of the challenge emerging from the intersection of advanced technologies and immersive digital environment demands that legal frameworks are adapted to respond to it. That said, as this virtual universe develops, the implications for artificial intelligence on authorship and ownership in IP law are growing more evident. AI generated content rise makes copyright appear complicated, sometimes to the point that it challenges any traditional idea of who is the author given that authorship as such is questioned. As a result, existing definitions and legal guidelines should therefore be critically rethought or redefined, so that they can appropriately conform to machine generated works.

All in all, copyright poses a multitude of intricately challenging questions in the Metaverse. The digital landscape changes, creative works need to be controlled in a similar way. User generated content is under constant questioning for the authorship, ownership, and infringement paradigms related to it, especially with the context of AI created works. By analysing the interactiveness and dynamism, as well as the decentralised structures in the Metaverse, it is evident that it is necessary to forge resilient ways of governance of intellectual properties rights. Both the potential for transformative developments enabled by the rapid pace of emergence of new technologies, such as blockchain and smart contracts, and their challenges, need to be reflected on and discussed actively and innovatively.

CHAPTER IV: POTENTIAL CHALLENGES WITH RESPECT TO TRADE MARKS IN THE INTERSECTION OF THE METAVERSE

4.1. Introduction

Digital environments, and especially the Metaverse have revolutionized trademark law with its entry. At the complexity of immersive virtual spaces, technology is always progressing while the traditional legal framework begins to break. At a more detailed level, this chapter discusses how one day equity in trademark law will always be linked with the Metaverse, and that includes analysis of key principles of trademark law, trademark law enforcement in that space, and emerging trademark law issues therein.

The marketplace property involves one of the important pillars of trademark law, which is brand protection, and its associated brand identities. First of all, due to the emergence of the digital environments and more so the Metaverse, the basic principles of law of trademarks should be adjusted to the digitized environments.¹⁴³ These days, virtual spaces are utilizing traditional definitions of trademarks intended to identify the source and quality of a product in the physical world, to apply to a world where consumers' interactions with brands have changed. Here, the trademark will generally refer to logos, symbols, designs, words or combinations of all the above, all designed to indicate the origin of the goods or services and distinct from those of others.¹⁴⁴

Besides source identity functions, Metaverse trademarks have also aesthetic functions. Playing and presenting brands in new dimensions will help people take in immersive experiences whilst they are using them. In the virtual environment, trademarks have a creative outlet to be exercised in the form of avatar trademarks as part of his or her identity or trademark in the context of virtual goods. This dual functionality has generated a difficult task for brand right's enforcement and interpretation when brands attempt to both support consumer innovation in this digital society and prevent the unauthorized usage of the brand.¹⁴⁵

Unauthorized use of the trademark is a problem attended to virtual environments, and the infringements take place in an entirely different way than traditional.¹⁴⁶ One such is the Metaverse which makes hoaxes, counterfeits, parody content spread more easily. As digital goods continue to evolve, so is the dilution of a brand, particularly in the case of very easy

¹⁴³ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁴⁴ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

¹⁴⁵ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁴⁶ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

copies and spreading of such content resembling or borrowing 'the feel of a trademark'. Such as when readers are exposed to bad representations of the brand, we can cause the lost prestige of the brand. The Metabirkins case shows that EU IP and consumer law intersect in a complicated manner in the NFT space. EU law may confer consumer rights on NFT purchasers in the case creatures meet the definition of consumer.¹⁴⁷

In addition, it is difficult for trade mark law to operate with brand rights enforcement in decentralized platforms. However, brand owners wishing to protect the interests of their brand in the spaces referred to above are at a loss regarding jurisdictional issues. Since there is no legal framework for the centralized issuing the claims of claims, we thus cannot ascertain the site of the claim of infringement. In these digital environments these are global in the sense that the users thereof are governed under different legal systems limiting the effectiveness of the effective trademark enforcement mechanisms. In the world that we are now in, where blockchain technology is growing, blockchain technology can give us solutions to the tracing of ownership and transparency that could clarify brands' rights better.¹⁴⁸ The use of blockchain technology and smart contracts brings new characteristics to the management of IP. While there are still many hurdles to surmount, the challenge to significantly improve security, transparency, and automation for the myriad of problems around IP is however attractive by itself.¹⁴⁹

There are also already enforcement challenges with trademark issues surrounding the digital goods where that representation itself becomes further complicated. NB, the concept of owner ship and the consumer's view of them on NFTs and in game assets is new. Consumers can not clearly ascertain when respecting a trademark or honoring ownership in a digital representative of that trademark. However, the vast difference is how consumers consider owning things in the virtual versus physical context. This challenge requires reviewing the requirements with which trademark rights are created, conveyed, or enforced.¹⁵⁰

The development of the modern trademark landscape and legal precedents that have become legal precedents to them play an important part in the evolution of consumer confusion. However, the Metaverse must be subjected to established principles and must be derived from them. Moreover, as the cases of established NFTs grow, legal evaluation of these rights is necessary to steer brand owners to what can and cannot be done

¹⁴⁷ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁴⁸ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

¹⁴⁹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁵⁰ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

in the virtual spaces to their rights. Therefore, reform in the trademark law shall be concerted. The principles of trademark protection will need to be adapted to virtual environments and they will have to be based on a systemic approach, which will include specific features of virtual environments. With more digital experiences taking place, to ensure the integrity of holiday brand, one will have to find a way to balance between legal compliance and innovation to create a thriving Metaverse Marketplace. The continual process of ordinary development is revealing the necessity of the legal environment that is able to embody both those traditional trademark norms and the novel situation of the digital interaction, as both kinds of people and kinds of businesses can come through such a twisting business trip with trustworthiness.¹⁵¹

4.2. Understanding Trademarks in the Metaverse:-

The advent of the Metaverse is what disrupts the concept of digital interaction to its core; this disruption lays the foundation for the trademark law's most comprehensive evolution. The richness of that experience in this big virtual environment comes from how those trademarks act as markers of source and also as aesthetic expressions. Because users interact with brands in immersive spaces through avatars and digital representations, the application and enforcement of trademark rights is significantly more complicated.¹⁵²

The Metaverse, it is a great move forward in the space of digital interaction, and by the same token it will present a great challenge to the frameworks of trademark law that have existed. trademarks in this huge virtual space have all these functions: they are an indicator of source, an aesthetic expression to improve the user experience in this environment. Trademark rights are more difficult to apply and, in consequence, to enforce, compared to other rights, because of their inherent complexity and the way in which users (indeed, the very presence of users) interact with brands as they move through immersive spaces.¹⁵³

The neutralization of content throughout discovery and display with user generated content, especially in interactive situations, is now turning brand owners over to the risk of false advertising by consumer confusion. The more users create and spread their interpretations of a brand, the more potential there is.¹⁵⁴ A species that is now being driven in digital world by data, information and the actual source of information, able to help a business grow and spread his innovation, this trade secrets and know how needs to be protected by a business. This blurring of authorized and

¹⁵¹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁵² Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁵³ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁵⁴ Steven Wilf, *Intellectual Property Law and History* (Routledge)

unauthorized content can erode brand identity, weaken the trust in the brand itself.¹⁵⁵

4.3. Imitation and Consumer Confusion: -

The Metaverse offers a unique way to explore this intersection between trademark law and behavior of the consumer in the Metaverse, reading what seems like a suggestion or impossibility in the Metaverse in a creative way focusing on how such words (or life events) will fit into society and the consumer behaviour. Imitation in immersive digital environments is very high potential for consumer confusion especially in complex virtual marketplaces. Without these basic borders between the physical world and the digital universe, brands tend to be seen and acts construed imitatively. Unlike the conventional way of shopping, the Metaverse utilizes the digital avatars as brands that we can see and replicate in the real world, which makes it less easy for us to recognize and judge the brands.¹⁵⁶

In the physical world, where trademark rights are more defined and enforced, perception of trademark rights and brand imitation in the Metaverse does not connect with what the consumers actually experience. Imitation may be abundant and user generated in such environments, so it may not look suspicious to consumers because as a general trend in such environments, imitation happens.¹⁵⁷ The Metaverse in such an immersive form is likely to make brand lines become half blurred where consumers may unintentionally confuse authorized and unauthorized uses. All this obscurity and the lack of any legal framework for the rights of brand owners in such cases have only created a fertile ground for consumer confusion, and in this sense the question arises as to whether this confusion can be justified or not.¹⁵⁸

There are several criteria that can be looked at to determine if digital experiences are infringing trademarks on grounds of consumer confusion. Other key indicators include the similar manner in which the competing marks appear, nature and channels of trade and the consumers. In addition, too, the confusion can also be assessed further, driven by the intent to imitate.¹⁵⁹ Through these parameters, it is found that trademark application in these immersed digital spaces is fluid and requires new approaches.¹⁶⁰

¹⁵⁵ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

¹⁵⁶ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁵⁷ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁵⁸ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁵⁹ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

¹⁶⁰ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

In addition, there is a second layer of difficulty in certain cases, in addition to unauthorized brand use, in the case of user engagements where the distinction between ownership is often not always clear and sometimes blurred, taking place on engagement participatory platforms. Such, they can also give unauthorized uses a means by which personal connections and emotional investments of brands are made, and can actually promote further influence. Responsibility and brand protection are important issues in these contexts due to the character of ownership. It is possible they also equate brands too closely that customers may actually be confused over whether they are looking at a real or imitation if the imitations are similar in how it responds or refers to the brands.¹⁶¹

The role that user-generated content plays in the Metaverse itself is another factor that is contributing to the potential for trademark dilution arising due to user generated content. A smart way to get user engagement and interaction, it simultaneously opens a (special) line from parody to trademark infringement.¹⁶² Then it becomes more and more ridiculous to distinguish and, yes, indiscriminately champion creative expression, and run the risk of brand integrity. Parodic content can however result in tremendous user interest and interactions which call for an intricate legal apparatus to manage all minutiae of interaction involving such content.¹⁶³

The Metaverse's future world of trademarks is a challenge and an opportunity. Adoption of traditional trademarks in order to take into account the particularities in immersive digital environment requires a brand owner to navigate through the multiplicity of consumers perception, the brand use of the trademark and technologies development in the field. Doing so will put them in a position where they will need to deal with realities of unlicensed trademark use, jurisdictions of trademark use enforcement, as well as the disruptive power user generated content has over brand integrity.¹⁶⁴ The evolution that has taken place in this domain highlights the need to develop an integrated legal framework of trademark rights protection in relation to the current technological evolution so as to enable the interest of brands and consumers to thrive in the Metaverse, a space of development.¹⁶⁵

Traditional trademark law's principles are set, but difficult when it comes to parody and art-related cases in the Metaverse. These immersive

¹⁶¹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁶² Connock A, *Media Management and Artificial Intelligence: Understanding Media Business Models in the Digital Age* (Routledge 2023)

¹⁶³ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁶⁴ Connock A, *Media Management and Artificial Intelligence: Understanding Media Business Models in the Digital Age* (Routledge 2023)

¹⁶⁵ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

contexts are not a natural fit for the fair use one might apply to traditional content consumption, where users may be consuming and creating in the same moment. Because of the evolution of the Metaverse, trademark law should be reconsidered in light of the new forms of expression and engagement, and in particular been grounded on the role of consumer understanding and expectation.¹⁶⁶

For the legal perspective, cases of consumer confusion in the Metaverse environment show how complicated trademark protection is. The case of the Metabirkins is very illustrative because it shows what happens when unauthorized use interferes with consumer perception and NFT legal status. The case shows that there is customer perplexity on a concrete level and it can practically influence digital economic rights protection schemes.¹⁶⁷ Although the Metabirkins case was resolved in the United States, it sets important points that deal with European Union intellectual property legislation, consumer rights' protection and NFT legalization within digital economy circuitry.¹⁶⁸

The decentralized platform structure of many Metaverse environments, however, is complex for trademark infringements from occurring. Due to the lack of subscribing to the particular laws, the trademark owners encounter problems in protecting their interests in multiple legal jurisdictions of virtual spaces.¹⁶⁹ The Metaverse, not having central control, means that brands to which users buy counterfeit products suffer considerable legal risk, without any knowledge of it.¹⁷⁰

The lack of Metaverse platform features affects consumer confusion in deciding which brands are offered by which companies. Different virtual domains for the users, with users familiar with brands, leads to the confusion about the affiliates of those domains, and so does it to increase the possibility of such connection errors. The additional complexity resulting from digital interactions comes from the fact that users can encounter different brand interpretations, a misinterpretation of the brand is possible.¹⁷¹

At present, the challenges of the current trends in Metaverse require new innovative legal rules and enforcement procedures owing to the extent of consumer confusion and imitation issues. Immersive environments require a customized approach for its protection where current security protocols

¹⁶⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁶⁷ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

¹⁶⁸ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁶⁹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁷⁰ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁷¹ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM): Routledge 2017)

are not up to Maryland's standards; therefore, new strategies are required to protect consumers and brands. Existing security measures are unable to tackle Metaverse challenges the way it supposed to and hence, organizations need to leverage an expansive security system ensuring secure privacy functions.¹⁷²

The legal framework is still in a state of development in order to minimise confusion which has resulted due to imitations. However, the acceptance of blockchain technology paves new ways for the protection of trademark, yet we need a well-designed framework in the condition of virtual worlds behavior. The successful development of the Metaverse will require the adaptation of current legal concepts to suit its needs otherwise they will lack customer trust and brand reputation.¹⁷³

4.4. Consumer Perception:-

Within Metaverse the immersive virtual environment, people's perception of things are dramatically changed. With digital products as well as virtual depiction methods, which differ from the traditional physical customer experience, companies face users. In these environments, consumer ownership understanding is bewildered by the difficulties people have in distinguishing between authorized brand representations and unauthorized imitations. Different digital versions of brand name will ambiguity presence, so the potential of brand impact will be weakened more especially if users consume trademark variations among digital platforms. The fact that brands still need to have a digital presence makes it an uphill task to protect the authenticity of their trademark from the plethora of content that is available.¹⁷⁴

This is a developing complex digital space where the digital and physical worlds are combined to give users extensive simulated environments, to become the Metaverse. Different interactive platforms are fused to provide users with a wide variety of digital reality where augmented reality combines with virtual reality. What makes the Metaverse different from the ordinary virtual spaces is that the users are in a permanent common space that allows them to contact each other immediately in the digital asset sharing. The high level of immersion provokes the introduction of new user reactions that alter, to the extreme, users' relationships with brands and the trademark memories.¹⁷⁵

The immersive environment in the Metaverse leads to new type of brand to user interactions since users' digital avatars experience physical as well

¹⁷² Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁷³ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

¹⁷⁴ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

¹⁷⁵ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

as computer generated goods within environments. Within Digital environment, Trademarks are playing two most important roles that is identification of source ownership as well as Beauty and user Interface. Trademark visual appearance and the user interaction with it gain new twist because of different brand manifestations used by the trade network distinct from traditional repositories.¹⁷⁶ This is why brands have to readjust their strategies as virtual items are a key feature in social engagements.

During the operation of Metaverse, trademark aesthetic functions are transformed and protecting these intellectual properties legally becomes difficult. Principles of trademark law built on traditional legal footings pave the way for distinctiveness along with confusion, however, are not especially equipped to describe the magic of immersive spaces. When users engage in this kind of brand related face to face contact through virtual characters and interactive tools, trademarks cease to be useable as single and independent identifying marks.¹⁷⁷ The enforcement problems with trademarks arise due to that they blend with the user identity elements making it difficult to define the legal definitions of trademarks.¹⁷⁸

4.5. Enforcement of Trademark Rights:-

Due to the nature of Metaverse environments, trademark rights are faced with sudden difficulties. Users gaze over numerous apparatuses with confusing consenture frameworks, which make untaintedness obstructions for company proprietors who need to ensure that their brands are being used without malice toward them. As there is no central authority that dictates trademark owners to test blockchain for trademark protection, it is up to Brand owners to develop ingenious methods for dispute resolution. And as it turns out, they are still in their first or second stages in their development of these things, or rather that the blockers they meet are both substantial and diminutive. Through blockchain, companies obtain the stronger visibility to the rights of ownership and enhanced transparency in relation to brand identity as the company deals with those issues in a complicated digital space.¹⁷⁹

As the Metaverse domain is evolving into a new space, brand new trademark enforcement difficulties arise, which the legacy trademark territory has never witnessed. The most serious trademark challenge in virtual environments is the use of a registered trademark without authorization. Because of the virtual sphere, trademark infringement identification is much more difficult in the virtual space than in a physical

¹⁷⁶ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁷⁷ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁷⁸ WIPO, 'Metaverse.' (WIPO Knowledge Repository, 2024)

<<https://tind.wipo.int/record/49114?v=pdf>> accessed 15 March 2025

¹⁷⁹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

one.¹⁸⁰ Trademarks simply slots into user generated content and that leads to situations of infringement that question who owns what and authenticity. Decentralizing the world can provide benefits to users that they will access through the digital platform interconnectedness so they are able to move seamlessly from one virtual world to another without breaking their immersion. The trademark rights-defining process is a seamless and at the same time complicated process, which on one hand gives rise to multi-dimensional complications, on the other hand, when one tries to interact with multiple platforms.¹⁸¹

The strength of the trademark dilution and tarnishing threats both in the digital environment are substantially greater than in the physical environment. When the boundaries of appropriate use of brand trademarks become hazy, the protection give to brand under applicable trademark law weakens as users can create and share the same digital versions of existing brands. Virtual environments are used by users so frequently that confusion over real vs unauthorized boundaries is not uncommon.¹⁸² The scams and misrepresentation activities of users are deep engaged through virtual avatars and interactive digital environments with brands. The fast changing spatial dimensions and temporal aspects make the trust management more complex as they affect metaverse dynamics.¹⁸³

In game elements including avatars and virtual items, the issues of trademark counterfeiting and consumer uncertainty escalate significantly. The manner in which virtual items are represented within the digital representation is a particular technique that generates perceptions contrary to any actual trademark ownership. For the majority of users, uncertainty arises regarding the source and the quality standard of products shielded by digital accessories attached to virtual characters. When the interactions between the consumers and the brands are digital, it is crucial to understand how perception gets affected due to the mistaken beliefs about the product brand alliances. Aesthetic uses of trademarks in the Metaverse increase enforcement risks in the Metaverse in determining ownership, and rights protection for virtual assets. The problem is that multiple jurisdictions make it harder to handle digital trademark infringement cases.¹⁸⁴

Decentralized architecture of many Metaverse platforms make the law hard to navigate for brand owners looking to protect the same Trademark

¹⁸⁰ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁸¹ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁸² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁸³ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

¹⁸⁴ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

in Metaverse. The practice of trademark enforcement becomes close to impossible when infringing incidents are occurring between multiple jurisdictions due to the absence of a unified regulatory structure.¹⁸⁵ Since this system is decentralized, the traditional ways of enforcing are fumbling and new legal frameworks shouldn't disregard numerous jurisdictional interactions. This phase will see the virtual world expanding out of the physical realm to be inhabited with all kinds of events and non reality based lives sprinkled in virtual domains.¹⁸⁶ Given specified problems in enforcing trademarks within this commercial system, the advancement in trademark protection methods requires specialized solutions. NFTs, together with smart contracts, form technologies that have both the opportunities for and the complications on, efforts in trademark security. The idea that one has digital proof of rights and further instigation to confuse the one that has the basic trademark rights. Furthermore, because NFT ownership of virtual brand items does not grant users any trademark or proprietary rights, such ownership will further confuse consumers. The legal structure of NFTs has to be changed as otherwise, customers will be confused as to what they are entitled to as regards rights and expectation of ownership.¹⁸⁷

It would also help resolving the issue of trademark rights, as there are none of them in place for NFTs. NFTs are self contained, thereby making trademark holders powerless to control mark within the meaning of trademark laws since there are a lack of standardized licensing agreements. It presents questions pertaining to smart contracts and statutory trademark protections, as they no longer know if smart contract can take the power to circumvent established trademark rights; or use it to enforce intellectual property in an autonomous manner.¹⁸⁸ It is to that development that legal practitioners are obliged to respond to the critical questions as to how these technologies are compatible in the new legal framework.¹⁸⁹ As recent legal cases, such as *Hermès International v. The fictions Rothschild* and *Hermès International v. The Rothschild* show a need for better NFT related consumer education as well as the associated virtual product ownership. The interaction with trademark regulation is thus so complex in several ways—including what types of interaction lead to understanding and judicial decisions—that such cases pose major problems. Effective handling of Metaverse challenges should be done

¹⁸⁵ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁸⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁸⁷ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁸⁸ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁸⁹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

under flexible regulations developed by lawmakers as swiftly evolving challenges.¹⁹⁰

Given that it introduces multi obstacles, new solutions and legal reforms are needed to make possible trademark enforcement in virtual environments. This means that the trademark enforcement measures in the Metaverse should also relate to its unique features. Content created by users and technological advancements are increasingly part of an overlapping relationship that must keep the stakeholders up to the minute and active in reaction to changing structures with complex emerging factors. Resolution of these issues is needed because their resolution preserves the trademark rights as well as ensures trust between the customers and digital marketplace.¹⁹¹

4.6. User Generated Content:-

The introduction of user-created content makes application of trademark law more difficult. However, benefits of expressing user through engagement have their consequence in consumer confusion. Whenever users are generating and distributing content with trademarked assets or using them any way, the amount of brand dilution increases. This is because existing defenses to the brand protection law prove to be inadequate in Metaverse based situations where brand protection is needed. It is important that brands handle difficulties from parody and satire because they affect how a brand is understood by the consumers. An NFT example demonstrates this, as identity management is complicated by the purpose of NFTs to possess ownership of different digital assets. Decentralized metaverse ecosystems NFTs build a brand new way of addressing problems associated with some users and anonymous environments.¹⁹²

For effective regulation of consumer interaction throughout the Metaverse, the law of trademark also requires such modernization. Traditional trademarks have a fundamental concept that needs to be updated as the consumer now spends more hours in environments where the creativity is shared feeling.¹⁹³ While brand protection indicators that emerged in traditional markets are unable to capture the dimensional characteristics of the brand engagement in digital markets. Unique ways of diluting and confusing trademarks continue to surface in new legal disputes over NFTs. NFT based identity management systems open new employment job

¹⁹⁰ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

¹⁹¹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁹² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁹³ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

positions and technological advancement opportunities on the metaverse, as well as investment opportunities.¹⁹⁴

Still, there is a problem on the lawmakers' hands when it comes to user made content in the Metaverse, as there is no clear enforcement rule about brand trademark rights. Consumers have blurred the line between typical brand usage and unauthorized application as consumers now create and disseminate their own distinctive viewpoint content about a brand. Implementing trademark rights becomes more difficult due to the fact that brand owners try to control the virtual use of their trademarks. Brand element misuse in famous brand creation of metaverse product is as misusing brand rights in a same way as conventional violation of the brand rights in the real world.¹⁹⁵ The decentralized nature of the Metaverse presents additional challenges for users because they will need to navigate different platforms with different regulations put forth by them. It complicates trademark disputes because, with decentralized legal system, there is no one authority to enforce, and the companies have to deal with the other disputes across different jurisdictions. Due to the fact that such unauthorized uses take place in multiple virtual areas, protected brands suffer from reduced trademark protection capabilities.¹⁹⁶ The characteristic of the virtual environments is dynamic, the traditional legal frameworks need the modern solutions befitting virtual space, therefore, need to be reviewed.¹⁹⁷

4.7. Brand Dilution in Digital Contexts

The term 'dilution-of-brand' evolved with the accessibility of the virtual spaces, such as the Metaverse. The trademark safeguarding in these interactive environments is of course complicated: these are platforms for users to engage with. With brands moving into these complex virtual spaces, the best brands to counter any brand dilution caused by the likes of user generated content and fluid online identities.¹⁹⁸

In Metaverse, brand interaction plays a major role especially on how authentic and how the brand would be perceived. Brands will very likely inspire a wide spectrum of narratives posted by users to and share about their opinions and experiences about the said brand, which may alter the original brand image. These interactions can blur the line between legitimate brand use and a trademark owner's rights. Branding infringement in Metaverse is the use of well known brand elements without proper use of brand elements in Metaverse products, no different from

¹⁹⁴ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

¹⁹⁵ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

¹⁹⁶ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

¹⁹⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

¹⁹⁸ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM): Routledge 2017)

doing it in physical world. Such misuse can also leave misleading consumer perceptions, which will put the brand recognition and reputation in jeopardy.¹⁹⁹

The other big issue in the Metaverse is NFTs, which might undermine brand integrity. Striving for greater flexibility and ease of selling intangible works, NFTs introduce complications with regard to intellectual property. They include uncertainties about possible digital equivalents of traditional trademarks and for example trademark ownership. Therefore, NFTs pose new issues regarding protection of and enforcement upon brand rights in a virtual context.²⁰⁰

Trademark parodies cause multiple problems with trademark law, expanding the uncertainties of that law. Because trademarked content confuses the steps of living and purchasing real products versus purchasing consumer-marketed content on the Metaverse, there are issues with fair use from infringement boundaries with the Metaverse. Brand owners need now to operate in conditions that intensify trademark weakening together with false representation risks, which is what makes consumer views able to transition quickly. The current laws are insufficient to deal with interactive environments and therefore legal framework of user generated content requires to be modernized. Flexibility of digital identity is a blocker to prevent the trademark owners from stopping unauthorized brand usage.²⁰¹ Users start developing digital personas that result in scenarios where clarity in the brand ownership is minimized. In a Sense of Metaverse, the present centralized identity administration systems are inefficient, as they lack in the aspect of security, and are also based on no authority.²⁰²

4.8. Sponsorship and Events in the Metaverse:-

Now, aspects like the Metaverse are quickly changing the sponsorship and events landscape for brands like never before, creating both challenges and opportunities. This virtual world has changed the dynamics of interaction of consumers with brands and necessitates brands to change the way they approach and model how they engage. Compare that to conventional sponsorship deals, based (in the way they work) in well established legal and regulatory environments, where the Metaverse complicates things around trademark rights, consumer expectation and brand representations of authenticity. This creates the need for a new

¹⁹⁹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁰⁰ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

²⁰¹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁰² Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

approach toward the sponsorship strategy, focusing on the brand orientation and fit with the consumers' reaction in real time virtual space.²⁰³

In most traditional sponsorships, if there is any relationship between brands and event promoters, it is more usually controlled by established rights and responsibilities. The decentralized nature of the Metaverse, however, hinders trademark enforcement around the exchange to some extent. There is no presence of a central regulatory body, this leads to legal uncertainties of brands affected by dilution at global platform with different governance structure.²⁰⁴

Ambush marketing becomes even more precarious in virtual events since it involves existing brand visibility without a formal sponsorship deal. The Metaverse has an immersive nature, consumers may mix up ambush marketing with a real brand touchpoint making it hard for brands that own the reputations to control their names. The interaction of online engagements of this new environment has distorted the perception of what brands represent the consumer and this resulted into increased ambush marketing.²⁰⁵

In the Metaverse, authenticity in sponsorship is more closely looked at because it aligns with brands' wishes to forge authentic relationships with users. Consumers judge authenticity by inhabiting stimulus for which they are already configured, which prioritises experience over an object of resemblance.²⁰⁶ This is a paradigm shift that requires brands to dedicate support to participatory experiences in sponsorship efforts that may not meet the needs of the digital crowd through traditional advertisement paradigms. As a result, the brand has to utilize the interactive aspects that could allow true consumer relationships in the Metaverse and loyalty without just visibility.²⁰⁷

The virtual events are a complicated and legal problem in protecting brands. For firms engaging in activity in a decentralized context where enforcement is likely to be weak, the problem is one of protecting one's trademarks.²⁰⁸ Implementing tactics such as harnessing advanced techs, especially non fungible tokens (NFTs), can help in improving the branding by ensuring that digital depictions are certified with ownership. This means

²⁰³ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²⁰⁴ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

²⁰⁵ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²⁰⁶ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁰⁷ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

²⁰⁸ Mallik S, *Healthcare Services in the Metaverse: Game Theory, AI, IOT, and Blockchain* (CRC PRESS 2024)

that NFTs can provide clarity regarding brand rights for consumers to know who and what is actually protected by trademark.²⁰⁹

As brands continue to go down further with digital experiences, knowing how consumer engagement can present itself not only as a tangible interaction with a brand but also a broader set of associated brand values and meanings is critical. Virtual interactions have the potential to enhance the affective connection consumers have with brands and especially so when the interaction is active and participatory. To capture this participatory culture, there has to be a rethinking of customer-brand relationships that should demand sponsors to develop emotionally resonant experiences and connection beyond physical borders. This is the way in which brands can strengthen loyalty among the audience, leveraging the exotic features of the Metaverse.²¹⁰

At the advent of user generated content in the Metaverse it becomes even more complex. More engagement but increases concerns of brand integrity and consumer confusion. To allow the consumers, brands have to also develop strong frameworks in conveying appropriate to use of their trademarks while encouraging creativity on part of the consumers. Since the line between approved content and content mimicry becomes blurred, the crucial collaboration with users in developing brand stories will be increasingly important.²¹¹

What brands need to remain in tune with is the changing needs of consumers in this same universe of sponsorship and events within the Metaverse. Today, as technologies are constantly being developed, such as blockchain, NFT technology etc, these also come with possible solutions to bettering trademark protection. However, brands investing in robust and responsive legal infrastructure proactively are in a position to protect their identities and maintain consumer confidence even in a fluid environment.²¹²

The more businesses shift to virtual sponsorships, finding a balance between how much of creative expression can be given versus trademarks needed is crucial. Therefore, brand managers and legal practitioners have to have a continual conversation on how to come with the solutions that keeps the trademarks safe and still helps with engagement. Brands have a chance to utilize openness to complexity and challenges to move

²⁰⁹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²¹⁰ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²¹¹ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

²¹² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

through the Metaverse while constructing interaction that captures the new paradigm of consumer involvement and brand credibility.²¹³

4.9. Jurisdictional Issues in Trademark Infringement:-

In such decentralized platforms and immersive virtual environments as the Metaverse, there exist unique jurisdictional challenges that pose problems for trademark enforcement. With the shift towards this digital landscape, brands are having to contend with the complexities of enforcing their trademark rights in several jurisdictions without the help of a central authority. The interacting of users that form their multinational composition creates a very complicated weaver of legal frameworks, with common and/or conflicting regulations in the trademark rights. Therefore, brand owners are at a disadvantage when trying to identify and stop infringement within these decentralized spaces, as well as when enforcing their rights.²¹⁴

For instance, Metaverse has a dynamic nature about interactions where different platforms allow users to interact with digital goods that can be subject to variable legal interpretations. The interconnectedness produces jurisdictional ambiguity when one tries to resolve trademark disputes. Between these virtual worlds users can navigate seamlessly with no idea of the jurisdiction where an alleged infringement actually took place.²¹⁵ Lack of a central governing body makes it difficult to create suitable legal venue for action, and this requires brand owners to handle a mess of various, often drastically different, international laws that are far from the classical enforcement mechanisms. However, in decentralized environments where users and contents are now beyond geographic boundaries, effectiveness of these mechanisms tends to diminish.²¹⁶

These jurisdictional complexities further exacerbate cross border disputes such that trademark holders may have trouble choosing the proper legal venue to assert their claims. However, under traditional frameworks, brands could count upon the application of a body of principles regarding jurisdictional determination in trademark cases. While there are decentralized autonomous organizations (DAOs) and so many platforms that exist in various legal regimes, identifying the proper forum is becoming more difficult.²¹⁷ By metaverse product, an unauthorized use of famous brand elements in metaverse could also be considered a malicious

²¹³ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²¹⁴ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM): Routledge 2017)

²¹⁵ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

²¹⁶ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²¹⁷ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

product of the same sense in brand violating that is also assignable to the real world.²¹⁸

Jurisdictional disputes have implications on the very nature of who or what maintains liability in the Metaverse. With a 21st century governance framework, DAOs are an exemplar in the world of decentralized governance, but also provide little in the way of the very basic responsibility of checking or recouping unauthorized use of trademarks. This evolving model creates a conundrum in the realm of responsibility as public notions of responsibility do not fit neatly in the decentralized framework. Therefore, it could become difficult to litigate on trademarks or to seek remedies against infringers propping themselves up under those organizational structures. Creativity and participation are at the heart of DAOs, which as arising, infect the legal landscape in their own nature, presenting legal gray areas where the rights and protections surrounding trademarks fall.²¹⁹

In the context of trademark infringement cases, it can be argued that Blockchain technology has the potential to act as a helping tool to solve some jurisdictional issues. Blockchain can address some cross-border disputes in the dispute process by creating a transparent and immutable ledger of transactions and ownership for trademark use to improve accountability and provide a definitive record. Blockchain provides a framework to establish where to enforce trademark, by tracking ownership rights and trademarks use in a decentralized platform. On-going evolution of these technologies can help varying brand's strategies in becoming resilient in enforcing their trademark rights in Metaverse within the complexity of jurisdictions.²²⁰

As you further navigate to the uncharted territory of user generated content within the Metaverse, an attempt to enforce your trademark further becomes more difficult. According to the creative landscape, users can interact with the brand in new ways, but at the risk of the brand owner's trademark being used for unauthorized purposes. In the digital context, there are blurred lines between permissible adaptation and infringement which brands have to relook at how they protect their IP.²²¹

Alternative approaches to overcome jurisdictional challenges of trademark infringement include smart contract technologies. Enforcement mechanisms can be automated by smart contracts creating enforceable digital agreements – smart contracts can mark out rights and expectations of use of trademark in a decentralized environment. Brands should pay

²¹⁸ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²¹⁹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²²⁰ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²²¹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

careful attention, coinciding with the development of smart contracts, to the extent to which their implementation has legal implications and whether they can govern live side by side with trademark laws. This creates the possibility for integration and so there is a need for dialogues between legal practitioners, technologists, and brand managers to establish best practice of managing jurisdictional complexity.²²²

Being in a dynamic, ever changing Metaverse, it is a constant challenge for brands to have to actively monitoring trademarks on multiple platforms. Traditional enforcement mechanisms that would serve as the means to safeguard brand identities in interactive virtual environments may not work as they used to.²²³ The prevalence of the Metaverse and its global and decentralized features approves it as a paradigm in the creation of global and decentralized brands in the new age, where it is imperative for brands to understand this technology and implement innovative strategies to address jurisdictional concerns and innovate with technology to protect brands better. By building stronger framework that is effective in the enforcement of brands in the Metaverse while maintaining clarity on rights and responsibilities, brands can easily operate in the complex network of trademark in the Metaverse.²²⁴

The need for adaptability and integration of legal framework in the legal dimension of trademark rights in the Metaverse is becoming more pressing. Trademarks rights do face jurisdictional challenges and brands must be up to the mark with the technological innovations and resort to proactive measures that can deal with the complexities present in the case of decentralized environment.²²⁵ Branding owners can further aim to encourage emergence of the appropriate legal reforms to safeguard their intellectual property while fostering creativity and engagement in the dynamic digital environment, by working on the partnerships and collaboration with various stakeholders across different sectors.²²⁶

4.10. Challenges in Trademark Registration

The Metaverse is an entirely new and unique space for the registration of trademark. Brands in transition into decentralized environments find themselves faced with complexities, which are nothing comparable to traditional trademark processes. The characteristics of decentralized platforms in which identities and assets are changing rapidly complicate the traditional categorisation and registration of trademarks. The lack of

²²² Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²²³ Mallik S, *Healthcare Services in the Metaverse: Game Theory, AI, IOT, and Blockchain* (CRC PRESS 2024)

²²⁴ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

²²⁵ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²²⁶ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

centralized authority means that brand owners must travel a system where trademarks are enforced only to a certain extent.²²⁷

There is an important problem inherent in the gaps that remain in the current trademark classifications, which generally fail to recognize virtual goods and NFTs. Most legal frameworks to describe trademarks are very focused on tangible items and do not have a place for virtual items.²²⁸ Misalignment can result in a confusion among a consumer's rights and ownership on digital representations especially with the developing NFT market that merges seemingly separate virtual and traditional items. The existence of these current existing gaps on the prevailing trademarks classification often fails to consider too for virtual assets and NFTs, thus giving rise to a pivotal issue.²²⁹ Most of the existing legal frameworks as to trademarks categorize mainly tangible items, while leaving out virtual assets virtual assets underrepresented. The resulting confusion could come from the fact that NFT outlining the boundaries between the trademarked counterpart and its virtual associated representations is not clear, as the budding NFT market blurs this line.²³⁰

To ensure complete harmony of trademark laws in the Metaverse, jurisdictional issues should be addressed in such strategies. Due to the complexities brought about by cross platform functions where patrons traverse different environments that operate on different legal frames, enforcement of a trademark right is even more challenging. In order to unify disparate regulations, there are coordinated approaches needed to keep brand protections up to date amongst an increase in digital interactions. The brands must adapt their trademark strategies to this ever-changing landscape, and this would require collaboration among the legal expert, brand and technology innovators.²³¹

Adapting existing trademark laws is not an evolving challenge of the legal orthodox, but it is also a challenge to foresee how the intersection of evolving emerging technologies with conventional legal parameters. As stakeholders expand and contemplate an environment that legally supports innovation and trademark integrity while developing it, the dynamic interaction between consumers and brands will serve as an important area of exploration and the rethinking of traditional assumptions. This will be a transition that requires vigilance, foresight, and adaptability that brands must navigate through an increasingly complicated digital

²²⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²²⁸ Mallik S, *Healthcare Services in the Metaverse: Game Theory, AI, IOT, and Blockchain* (CRC PRESS 2024)

²²⁹ Shaikh AA, Mutanov G and Karjaluo H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

²³⁰ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²³¹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

world. With the Metaverse emerged as a major player of the consumer interaction game, a conversation on deliberate creation of legal norms that can survive the cut throat rhythm of the new immersive space is required.²³²

The more brands are figuring out how to navigate the complexities of the Metaverse and the more brands we continue to see investing in it, the more you cannot ignore what impact it will have on brand integrity and consumer trust. As digital goods become more prevalent, how consumers perceive ownership has a very strong impact on their relationship with brands. In immersive environments, the strategies that brands use must be to define clearly ownership and usage rights in the landscape of the digital goods and trademark protection so that consumers can reliably parade through the digital landscape.

4.11. Classification Gaps in Trademark Law

Since trademark law and the Metaverse are in confluence, it presents a real opportunity to examine the gaps in classification in existing legal regimes. Conventional trademark classification systems mostly accommodate physical products and services and do not, by and large, consider the unique features of virtual products and non-fungible tokens (NFTs) that fill the Metaverse. And as these brands go to live in these virtual worlds, they're dealing with a kind of gap in current legislation where they don't have a way to protect their intellectual property in a way that is decentralized and digital.²³³

Another concern under the surface is the lack of fit of existing trademark categories to the precarious yet creative nature of virtual assets. Interestingly, unlike traditional trademarks, which are identifiers of the source, quality or goodwill of the product itself, virtual goods used in the Metaverse, whatever that means (because who knows — everything from digital art, to virtual fashion items to NFTs for inanimate objects that make something distinct, unique) need to recalibrate what is a trademark. The hard part is brokering alignment between these contemporary ways of categorizing things and the ever-varying pace of a digital engagement landscape.²³⁴ More specifically, the legal frameworks neglect the phenomenon where users are capable of replicating, manipulating, or interacting with branded digital content in unexpected ways outside of definitions established by previous legal concepts.²³⁵

²³² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²³³ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²³⁴ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²³⁵ Denoncourt J, *Intellectual Property, Finance and Corporate Governance* (Routledge 2020)

Moreover, the decentralization function provided trademark owners with the option to increase complexity in enforcing the trademark. In decentralized environments where members interact without a central authority's management, at best attempts to police and enforce trademark rights are dispersed. Brand owners have difficulties locating and correcting unauthorized uses of their trademarks, particularly when these can be executed at the same time in infinite virtual worlds. The opportunity for conflicts of jurisdiction exists since users move across various platforms, each that has its own differing legal regimes, thereby weakening the efficacy of conventional trademark enforcement measures.²³⁶

4.12. Non-Fungible Tokens (NFTs)

Another level of complexity in trademark matters in the Metaverse is introduced by the development of non-fungible tokens (NFTs). Giving NFTs an ability to establish the proprietorship over distinct digital objects is a possible solution to brand rights control within decentralized systems. As it is, there is confusion about proprietary rights as the registered trademark views an NFT, the digital object that it stands for, as the source of the brand that it is registered under.²³⁷

Along with that, a lack of harmonized licensing frameworks for NFTs makes trademarks rights problematic even more. Each NFT is a distinct entity that doesn't come with uniform licensing requirements of brands for their marks in the digital space.²³⁸ Largely absent from these new models of digital asset ownership are overarching legislation that would sit alongside current trademark protection, similar to the process followed in centralized ownership models. In this shift, legal reforms must make for more clarity mainly around owners' rights and consumers' perceptions.²³⁹

4.13. Smart Contracts and Trademark Enforcement:-

A big change is smart contracts being used to enforce trademarks within the Metaverse where the use of new technology has led the control over its intellectual property rights to become more complex. With the ability to automate processes about the use and transfer of trademark, smart contracts with the terms of the contract written into code, also known as smart contracts, are able to.²⁴⁰ Such automation could in theory allow the enforcement of trademarks to be more efficient by preventing interference by intermediaries and checking. With blockchain, it is possible to create an architecture in which title and transactional history can be verified by

²³⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²³⁷ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²³⁸ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²³⁹ Shaikh AA, Mutanov G and Karjaluohto H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

²⁴⁰ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

anyone in order to ensure that it is truthful, which is something that can come in handy for trademark administration in order to increase transparency and security for trademark rights administration. However, new conflicting issues arise with such dependence on smart contracts, like coding errors or misinterpretation affecting also the enforceability of trademark rights.²⁴¹

The code of the contract is susceptible to an easy error that may have unintended devastating effects such as unauthorized use or transfer of trademark protected features which cannot be easily corrected. Accordingly, they require a profound understanding of technology and law in order to handle these complications. When brands interact with the code and that code fails to meet legal requirements – the technical correctness and legal enforcement are dependent upon each other and, thus, place brands and the technologists working to keep them safe in a position of mutual dependence, necessitating a cooperative partnership between technologists and lawyers. Digital spaces also add to their distinct characteristics the interference with existing frameworks for the enforcement of trademarks.²⁴²

In the Metaverse, brands can have a dynamic and multi-dimensional brand identity, but also need new approaches for protecting their trademarks while taking advantage of the decentralized nature of transactions. It's about understanding how the governance structures on platforms that use smart contracts can alter how smart contract are used. So, every platform will have a governance model of its own, that will tell how brands can govern the measures of enforcement. By being decentralized, trademark laws become inconsistent and it complicates compliance for brands that are doing business in varying environments. Second, the nonfungible token (NFT) licensing arrangements involved in trademark protection also constitute a second dimension of complexity pertaining to smart contracts. It allows brands to claim over digital commodities and with that, a new paradigm in which such rights are inscribed in the smart contract. The significance of managing separate licensing models for NFTs that reflect their uniqueness lies in the fact that these models should allow for both the primary of trademark rights and thereby also enable user engagement in the digital space.²⁴³ Moreover, the ethical matters of smart contracts become more important. Use of automation under smart contracts can potentially raise potential issues regarding consumer rights and the brand integrity. While these brands are, albeit at times, leaving little to chance, they are doing so through their ventures with these technologies to first

²⁴¹ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁴² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁴³ K. H and Rodríguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

ensure fairness of interaction and second, and most importantly, to balance ethical dealings with digital honesty and transparency. If governments would ensure continued public trust and credence, it requires that respect for consumer rights should be developed, particularly in decentralized cultures.²⁴⁴

However, as the company's progress through these obstacles, it is vital that the companies adhere to both traditional trademark regulations and evolving technological norms.

So, for example, synchronizing the machine-based processing processes of smart contracts with long standing legal protocols can require amendment of existing laws or having the involved new regulatory frameworks for specifically distinguishing the character of the digital platforms.²⁴⁵

Moreover, brands have to guarantee that the rights within smart contracts continue to converge with the changing trademark law to avoid any conflicts by safeguarding their intellectual property properly²⁴⁶. Finally, viewing smart contracts in trademark enforcement allows inference for the classic trademark brands upon which to evolve to allow further transition to the novel landscape that online commerce presents. This implies that stakeholders continuously need to invest in keeping up with technological evolution as well as legal developments, while simultaneously advocating for a consistent approach on trademark legislations which will foster innovation and preserve brand credibility in a vast digital frontier like this.²⁴⁷

As technologies and consumer behaviors change, trademark enforcement in the Metaverse will become more complex and these proactive investments will be needed to navigate through it.

4.14. Case Studies:-

4.14.1. Hermès International v. Rothschild

The Hermès International v. Rothschild case is a prime example of the changing face of trademark law in the digital age, specifically the issues that luxury brands encounter in defending their trademarks in the Metaverse. Rothschild, which is famous for releasing NFTs of various luxury brands, including Hermes, the owner of a famous Birkin bag, sued the Deckpoint, which was responsible for the creation and sale of the NFTs

²⁴⁴ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁴⁵ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁴⁶ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁴⁷ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

that were talking about and even using the brand's trademarks. Thus, this case interwove supreme legal issues concerning the dilution of trademarks and parody, securing one of considerable import concerning the treatment of trademarks in the virtual space.²⁴⁸

Secondly, Hermès's main argument was that the use of the Birkin bag in Rothschild's NFTs constitutes dilution of the trademark, a legal doctrine designed to protect the distinctiveness of famous marks against devices that would weaken these marks as to when they would be competing with diluting mark.²⁴⁹ According to the brand, said parody was probably going to confuse the consumers into believing that they might be somehow affiliated with Hermès products. Additionally, it believed that Rothschild's actions damaged the luxury image of the brand by associating the brand with products which could be associated with a lowbrow product or one not sanctioned or endorsed by the brand. In this context, Hermès further demanded injunctive relief to enjoin further sales of the infringing NFTs, not only as damages but also in order to prevent the sale of NFTs that could jeopardise the cachet and exclusivity of the brand.²⁵⁰

The court made an important interpretation of parody as it relates to the trademark rights. The issue it considered: Whether Rothschild's writings came within or beyond the First Amendment's protection from infringement of the copyright in his writings through his claim of artistic expression. The court recognized that for some analyses, parody will have its place in debates over words like in the Rogers test, but parody cannot be the source or sponsorship of consumer confusion. The Rogers test is viewed as a proper balance between the First Amendment interests in protecting artistic expression and the Lanham Act's purposes in acquiring trademark rights and was viewed as such most courts ("Most courts view the Rogers test as a proper balance between the First Amendment interests in safeguarding artistic expression and the Lanham Act's goals to obtaining trademark rights.").

Not just defining the boundaries of artistic expression, this confluence of trademark rights and free speech also has bearing on what goes on in marketplace forces and the consumer attitudes who populate those forces. The ruling in Hermès International v. More general implications of Rothschild that touch beyond the immediate case are relevant for luxury brands in relation to digital platforms broadly. There is one issue in particular that luxury brands must face where there is a threat of confusion

²⁴⁸ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁴⁹ Shaikh AA, Mutanov G and Karjaluohto H, *Blockchain, Metaverse, and Digital Payments: A Global Digital Consumer Perspective* (Routledge, Taylor & Francis Group 2025)

²⁵⁰ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

of consumers in the market spaces and if a consumer makes a mistake and thinks a parody is a true product of a brand then the fundamental essence of trademark protection i.e. it has been used to distinguish and distinguish goods, is upset. It is therefore necessary to revisit by whom identities are developed in virtual environments and the legal remedies sought for protecting the interests.²⁵¹

Furthermore, this serves as a precedent for establishing the best practices in protecting trademark in the Metaverse from parody. With the rising arsenal of parody on the art side, luxury brands will have to develop proactive solutions that account for the reality of digital interaction and the higher frequency of parody to the procured relationships. These brands need to ensure that the consumers have clarity what kind of product they are making and how to use their trademarks in various digital platforms, including in the Metaverse.²⁵²

The case also talked about which point of the NFT technology has been placed in the issues of trademarks. The trademark terms have been overturned in the digital economy and, therefore, the issue of trademark rights is causing a great deal of controversy. As pointed out in recent literature, "The emergence of NFTs has created a profitable market, resulting in more trademark litigation." With the spread of NFTs comes special situations where brands have to navigate these industries of ownership, right management, and talking about things on the internet. This indicates that brands must project how to license it with their trademarks in use in NFT format and at the same time eliminate potential risks from misuse and brand identity dilution.²⁵³

In conclusion, *Hermès International v. Rothschild* presents a landmark case that sums up the ins and out of luxury brands in protecting trademark rights in the Metaverse. With digital spaces progressing so will brands' strategies and brand legal understanding of parody, confusion amongst consumers, and possible dilution of brand rights through the use of parody. In effect these rulings will serve as a touchstone to guide through the new 'intersections' of trademark law and new digital technologies in the future.²⁵⁴

4.14.2. Nike v. StockX

The Nike and StockX lawsuit is a critical point of overlap between trademark law and when NFTs are sold on online marketplaces. It all occurred at a time when StockX was beginning to sell NFTs that represent

²⁵¹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁵² Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁵³ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

²⁵⁴ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

ownership of verified sneakers. But at the heart of Nike's case was the accusation that by operating as a marketplace for these NFTs, StockX was infringing on and diluting Nike's trademarks, and engaging in false advertising, because consumers — and especially consumers with an interest in Nike — might confuse the related brands.²⁵⁵

StockX had several trademark allegations thrown its way against Nike, because it was selling NFTs, and its products could be confused with Nike products. According to the company, by its use of Nike's trademarks in connection with the sale of NFTs, StockX purported to create the false impression that Nike endorsed the offering, which it didn't. It was important because high premium brands and high demand consumer goods require a perception of brand integrity and authenticity. What further complicated trademark law in the Metaverse was that it didn't know at that time who the rightful owner was of the digital assets at issue and what rights were associated with those digital assets.

The case helped to analyze how the court applied the already existent trademark laws to NFTs and how courts were required to adapt to the technological advances using currently existing legal structures. NFTs did to intellectual property norms what they did to abstraction, namely, to disrupt the existing framework and let the judiciary rework its form of digital ownership and affording entitlements to them. For example, the court decided whether the rights of ownership attached to the trademark could be compared to the rights of ownership of the NFT, which was noteworthy as a proof of ownership of a physical sneaker. It set a vital discourse on the interaction between the virtual presentation of physical goods.²⁵⁶

The court's ruling on trademark infringement in this case centers on consumer perception. To answer the question under the Lanham Act, controlling over trademarks in the United States, the court was forced to consider the possibility of consumer confusion. Consumer perception was an important factor in relation to the court's conclusions, because of culture regarding sneaker collecting and a heavy emphasis on authenticity. This confuses the overall weight of Nike's trademark claims about NFTs and it's not the first time someone has attempted to sell fake goods as NFTs, after all. It implies the high importance of brands that seek to tap on ownership of intellectual property in the dynamic world of digital business.²⁵⁷

The implications of the Nike v. StockX case are indispensable for brands selling products in the Metaverse, or in other words, brands that are

²⁵⁵ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁵⁶ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁵⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

related to trademark enforcement and brand management. With NFTs having exploded as a digital way of representing ownership, brands must take a lead in taking forward thinking steps to protect against anything that may infringe their trademark rights while simultaneously alerting consumers of the difference between original products and the NFTs proffered in association with that product. Perhaps some of the weapons that may help in countering the danger of confusion or misuse of brand identity in emerging marketplaces may be transparency and consumer education.²⁵⁸

Additionally, the decision of the Nike v. StockX case has far reaching effects on future trademark rights pertaining to NFTs. These would indeed change how brands go about setting up licensing strategies for NFTs to ensure that no integrity of brand is lost while the prospect of innovation through digital forms percolates. The giant case will remain a subject to stakeholders' attention as it continues working on influencing interpretations and creation of norms for trademark usage in virtual marketplaces.²⁵⁹

In order to navigate the complexities of the NFT marketplaces following the Nike v. Other brands need to be mindful of their trademark rights if they want to profit as a result of StockX ruling. The issues may include the development of more robust contracts that elaborate on what rights apply to NFTs and what guidelines to monitor on whether the marks are being used appropriately within the online environments. In order to find ways for balancing veteran IP methods with new digital assets, attorneys will need to become competent in blockchain technology.²⁶⁰

Lastly, the Nike v. StockX case is an excellent example of the problems of interoperability for trademarks in the Metaverse. Different platforms to enforce copyright and trademark shall be varied; for example, it would be difficult for the brand to strictly control their digital identity in a unified way. In such a fractured environment, actors are going to have to be flexible, ready to rip off intellectual property, so we are making it easy for them to do that. In this sense, this case is an important touchstone where the law of trademarks continues to be developed, and opportunities and challenges that new technological environments offer to existing models of consumer engagement and brand integrity. In addition, as commerce becomes more and more of an issue in the digital world, those fundamental precepts will define how brand policies are both safeguarding trademark rights and giving the consumer access.²⁶¹

²⁵⁸ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁵⁹ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁶⁰ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁶¹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

This is out of which the lessons from Nike v. StockX case are conjunctive boundary points between technology, law and consumerism, but with the responsibility for brands to take a conscious step forward to master these forces (or sell out to the Metaverse?) lest their trademark endure the upheavals that come with the Metaverse. As recent authors have noted, The Metaverse's unique characteristics necessitate new legislation to address intellectual property rights, particularly concerning user-generated content and virtual assets. The debate surrounding this case is a vital support for exploring the development of trademark law and management of rights in online platforms.

4.14.3. Yuga Labs v. Ryder Ripps

The judicial proceedings in Yuga Labs v. Ryder Ripps identify a critical nexus of trademark law and the nascent field of non fungible tokens (NFTs). The Bored Ape Yacht Club is an NFT series by Yuga Labs, a leading case here, and Ryder Ripps is a well known artist and digital rights activist and parodist of art. The heart of the conflict involves Ripps' use of Yuga Labs' trademarks and branding features in his own NFT project, which he called the "RR/BAYC." However, Ripps argued that his project was social commentary and critique, in the spirit of a defense under the doctrine of fair use, an argument Ripps believed he was entitled to, to justify his defense.²⁶²

This is one of the special challenges of this case as to how one would ascertain whether Ripps' work is infringing on Ripps' trademark or is simply a legitimate artistic work that not only is protected by the First Amendment but also inspires perfect response -- in short... protects it with the clean hands doctrine. While parody is a field that typically wrestles with determining what is legitimate artistic work and how far properly parodying someone is in trademark law, the court must also deal with the impact of parody.²⁶³ The courts are inexorably trying to work out what this balancing act looks like for digital property, and how the way that certain interpretations are dealt with will have an effect in future NFT based litigation. The strongest point of argument is over consumer perception, typical for Yuga Labs if anything: the similarity of design leads Yuga Labs to contend, of course, that the way consumers will respond to the products is likely to be confused. This raises the necessary tests in legal trademark dilution and confusion that are already well established, but now applied in a very digital way.²⁶⁴

²⁶² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁶³ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁶⁴ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

It also bears on the construction of trademark dilution in such a metaverse. The faster companies move into, or try to move into, virtual marketplaces (and frankly, the more such places there are), the stronger the need for protecting trademark against misuse. Ripps' action cast a shadow on the flexibility of trademark law to change with the new paradigm of business with NFTs. This has been highlighted by the fact that the ownership indicated by NFTs is not only physical, but also serves as cultural objects that gain popularity among the online communities quite fast. In this regard, the court's decision could resonate in many ways of online brand management, including the policy of trademark of brands in NFT economy.²⁶⁵ Further, *Yuga Labs v. Ryder Ripps* is also strong on its legal argumentation based on consumer perception. One of the features that mark out trademark controversies is consumer confusion, an issue that here offers a clear insight into how digital spaces reshape brand identity. The Potentials embedded in NFTs are part of the complexity; as stated in recent research, NFTs provide a novel solution to the identity management problem in decentralized metaverse environments, solving problems such as multiple identities and anonymity. Therefore, how consumers navigate and recognize brands might have a significant impact on the decision of the case.²⁶⁶

This case involves the dynamic pitting trademark protection against parody as an artistic expression. The thesis asserts that the transformative use permitted in parody is the only use that can elevate artistic speech above the force of trademark rights provides essential questions about the scope of intellectual property rights beyond its established limits. The details of this case informed by themes and debates regarding freedom of artistic expression on the one hand, and corporate impotence and dominance on the other. This confrontation has wider implications the more that the market becomes digitalized and foretells the possibility of scandal with any iconic trademark play in the artistic sphere of the Metaverse.²⁶⁷

The *Yuga Labs v. Ryder Ripps* case also has important messages for brands about how to make it through IP protections in the NFT scenario. The future of the digital frontier is fast approaching and companies with access to IP have an important need to address potential infringements and the complexities of artistic expression with adaptive IP strategies. This decision could establish a new path for future enforcement procedures and

²⁶⁵ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁶⁶ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁶⁷ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

guidelines to strike a balance between the requisites of a protecting right like a trademark and what constitutes ownership in the digital world.²⁶⁸

Also, circumstances of jurisdiction are underscored in the case. International trademark enforcement is harder because a large number of brands operate in several territories and enterprises and because there is often a large number of transactions that are decentralized. *Yuga Labs v*, which was a ruling. The implications of *Ryder Ripps* is likely to shape up how companies develop their global trademark strategy as to the classification of digital assets and their related rights. The *Yuga Labs* case ramifications reach into ensuing legal discussion concerning the categorization of digital assets and their respective rights of ownership. *Yuga Labs* case implications have implications beyond a future legal discourse on the classification of digital assets and the rights of the ownership of digital assets. With businesses grappling over what the new digital reality means for them where it concerns being able to own something capable of having market value and yet also being a reflection of cultural satire, this precedent may establish a trajectory for shaping the future legal framework governing the world of the Metaverse. This is an examination of settled tradition in trademark law and courts must learn to change to allow for the multiple facets of digital ownership.²⁶⁹

With these forces at play, the lessons of the *Yuga Labs v. Ryder Ripps* case can teach brands the way to move forward with additional complications of trademark law in the Metaverse. This means brands will need a way of feeling about how far and where their intellectual property rights meet the cultural value of NFTs, where they're well placed enough to defend their intellectual property, and at certain points, do the opposite and respect the artistry of a burgeoning digital world.²⁷⁰

4.15. Platform Liability in Decentralized Environments:-

The trademark liability is complex increasingly because the structure of the platforms in the Metaverse is also evolving. In this chapter, the legal liabilities of decentralized platforms for trademark infringement in the cases of unauthorized use of these marks are analysed, while the challenges that a trademark owner has to face in such environments are taken into account. Therefore, in a decentralized environment such as the Metaverse, conventional legal norms have challenges in properly

²⁶⁸ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁶⁹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁷⁰ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

addressing the nuances resulted from the new technologies in terms of enforcement of trademark and the location of jurisdiction.²⁷¹

The question is what legal liability decentralized platforms have to trademark violation. With decentralized platforms, there are no established legal jurisdiction and regulatory authorities, it's an unhindered band of business operations and in other words, decentralized platforms do not have a governance framework. As a result of this lack, jurisdictional accountability becomes more difficult and asks how far these platforms should be legally bound for unauthorized trademark use.²⁷²

User generated content is the signature of decentralized systems, and thus, it is more probable that some user generated content infringes on trademark rights of its owners, without their permission. That is to re-evaluate the way trademark law is enforced and applied in the Distributed Metaverse.²⁷³

Trademark protection in the decentralized spaces (like the Metaverse) is searching for a new matrix of legal obligations, which very much require re-framing of existing paradigms. The flexible nature of the Metaverse unfolds as an interaction between digital technologies, user content and no central authority; this necessitates the dynamic knowledge of the moving frontier.²⁷⁴ Trademarks will no longer be only about today's challenge, but will instead involve the development of a stronger system of trademark protection by use of adaptive strategies and cooperative efforts among legal professionals, brands, and stakeholders, that looks forward with integrated preparation to the changing digital world.²⁷⁵

4.16. Conclusion

Finally, the last segment discusses how the conclusions from this research would blend to analyze the developments in the Metaverse space concerning trademark law. Major changes of the field of trademark law are driven by the growing digital environments. There are many intricacies where trademark owners enter the Metaverse with jurisdictional uncertainties surrounding and unauthorized trademark use and unclear boundary of user generated content.

At present, trademark owners are in the midst of their greatest challenge since they are called upon to address the myriad of problems in NFTs and immersive digital spaces. The first is that to support the concept of the

²⁷¹ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁷² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁷³ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

²⁷⁴ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁷⁵ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

Metaverse, intellectual property rights will warrant new legal standards that are specific to virtual content and digital possessions due to the different and very specific character of the possession and content it contains. Currently, existing legal frameworks should be reformed to include specific reforms to effectively protect trademarks from challenges that exist so their protection is on the strong side but also is fostering innovation.

Legal changes of flexibility are needed today to rule contemporary digital challenges, a change that will provide better protection. Smart contracts as a fundamental blockchain technology can be applied to enhance trademark protection in the contemporary digital environment. This technological solution allows brands to have clear insights about ownership and effective monitoring system that they can use to establish of its rights to the brands in all kinds of Metaverse complex domains.

Trust is what consumers expect from brands and companies have to build that trust in the modern environment, which today is Metaverse. Activities should protect the ownership of a trademark by brands and should be used for interacting with consumers. The proactive potential of these digital platforms is of creativity, that serves to strengthen brand-to consumer relationship, in line with current marketing pattern from the digital marketing industry. Authentic audience crafting interactions should work in tandem with the protections of the trademarks to create digital consumer value.

There is a need to develop mechanisms that will help build consumer trust and loyalty in the Metaverse's approach to brand engagement. Activities that protect the ownership of the trademark are something that a brand should interact with the consumers through. Digital virtual environments are a marketing tool in which innovativeness enables the establishment of better consumer relationships, which is the current direction of digital marketing. Companies are required to establish true digital connections with their audience base; at the same time, they have to keep their trademark security intact.

In the future, adopting to current consumer trends and technological innovation will have a large impact on the functionality of trademark law in the digital landscape. Users' expectations of ownership and authenticity will be shaped by how digital assets are commonly used in digital immersive contexts. This will make an active approach to analyzing these trends, as well as creating industry-wide partnerships will be critical.

Thus, the peculiar combination of trademark law with the Metaverse is without any other equal in its challenges and opportunities. Legal reforms, flexible brand strategies, and new technologies will be essential in unraveling these new complexities to protect brands while avoiding stifling

a vibrant and creative marketplace in the digital space. The final effective crossing of such an area will be contingent on legal experts, brands, and policymakers working cooperatively to create a safe space for all the parties involved in the big picture landscape of the Metaverse.

CHAPTER V: POTENTIAL CHALLENGES WITH RESPECT TO OTHER IPs (Industrial Designs, Patent, Geographical Indication & Trade Secrets) IN THE INTERSECTION OF THE METAVERSE

A. Industrial Designs

5.1. Introduction

Generally, industrial designs only protect the ornamental and aesthetic aspects of products, which are meant to make goods differentiable so as to attract buyers through their visual appeal. At a time when industrial design protection is having a much larger role as the Metaverse begins to create new virtual spaces populated with avatars, digital objects, and immersive environments, we had a number of questions. Today, digital clothing, architecture, vehicles and furniture in virtual worlds are now economically, marketable, and branded.²⁷⁶

What hurts is that existing industrial design laws can not be enforced due to replication, unauthorized commercialization, and easy modification of digital designs in decentralized, persistent, and borderless environments. This chapter first studies how industrial designs should be within the Metaverse and then analyzes forms of infringement, barriers for enforcement and recommends ways to provide future proofing industrial design protection.

5.2. Legal Framework for Industrial Designs

5.2.1. Definition and Scope of Industrial Designs

Under the Hague Agreement and the WIPO guidance on industrial design it is understood as a practical, industrial amend that includes shape, ornamental or aesthetic features such as for example, pattern, lines or color. In addition, it must be novel and have a particular character which is different from other existing designs.²⁷⁷

5.2.2. Requirements for Protection

Criteria of novelty and originality have to be met by designs. The Metaverse raises complications when applied to mutable, interactive digital environments and they should have been sufficiently fixed to allow legal registration and enforcement.²⁷⁸

²⁷⁶ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

²⁷⁷ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

²⁷⁸ Kongolo T, *Intellectual Property and Emerging Technologies: Generated Global IP Issues and Challenges* (Routledge 2025)

5.2.3. Duration of Protection and Enforcement

They have to meet criteria of novel and originality. Once applied to mutable, interactive digital environments, the Metaverse introduces complications which should have been sufficiently fixed to be legally registered and enforceable.

5.3. Industrial Designs in the Metaverse

5.3.1. Expansion to Virtual Goods

Almost every shoe distributor, clothing brand, jeweller, virtual estate builder, as well as the major architects of the Metaverse have chosen to take their industrial designs out into the truly digital spaces, where avatars' fashion outfits, buildings in virtual real estate, virtual race cars or jewellery sold in the metaverse all just exist in a digital form. Real as they are, these virtual designs have real-world commercial value with real transactions fueling their value; NFT sales, licensing, and brand collaborations.²⁷⁹

5.3.2. Economic Importance of Virtual Designs

Branding and identity in the Metaverse are important and they require virtual designs. Virtual design assets are so valuable that it creates revenue streams in virtual goods such as Gucci Garden in Roblox or Balenciaga's collaboration with Fortnite.²⁸⁰

5.3.3. Challenges in Registration of Virtual Designs

Many virtual designs have not traditionally been accepted or classified by traditional IP offices. The ambiguity around registering digital only assets comes from the fact that most registration systems work with physical goods.²⁸¹

5.4. Forms of Potential Infringement

5.4.1. Unauthorized Duplication of Digital Designs

Although digital assets can easily be copied, replicating fashion items, architectural structures or vehicles or vehicles in high fidelities without the consent of the original creator and resell them on various platforms is possible.

²⁷⁹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

²⁸⁰ Kongolo T, *Intellectual Property and Emerging Technologies: Generated Global IP Issues and Challenges* (Routledge 2025)

²⁸¹ Burden D and Savin-Baden M, *Metaverse a Critical Introduction* (CHAPMAN & HALL CRC 2024)

5.4.2. Commercial Exploitation without License

Unauthorized use of protected designs through use of virtual marketplaces is permitted. Brand value is diminished when fake virtual sneakers are sold or there's cloned architecture in a virtual city.²⁸²

5.4.3. Derivative Works and Partial Infringement

Some derivative works, such as partial modifications (e.g. slightly altering a digital handbag design) are not in obvious violation of the protected design whilst infringing (and therefore are less detectable).²⁸³

5.4.4. Cross-Platform Copying and Distribution

Where an industrial design was created for one virtual platform (Decentraland) for example, it may be illegally transferred or sold to another (Fortnite or VRChat), making it hard to know who to enforce against.

5.5. Enforcement Challenges

5.5.1. Territorial Limitations and Cross-Border Issues

Metaverse is not territorial, but design registrations are. It is costly and complex to enforce against infringers operating across jurisdiction.²⁸⁴

5.5.2. Anonymity and Lack of Identifiable Defendants

Most of the interactions in the Metaverse are pseudonymous, which makes it hard to trace real world human nor business or steal from the design.²⁸⁵

5.5.3. Ineffectiveness of Traditional Takedown Systems

DMCA takedowns and equivalents are, of course, available, but most decentralized platforms operate outside of traditional jurisdictional frameworks with no effective methods of handling infringements.

5.6. Legal and Policy Considerations

²⁸² K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁸³ Kongolo T, *Intellectual Property and Emerging Technologies: Generated Global IP Issues and Challenges* (Routledge 2025)

²⁸⁴ K. H and Rodriguez RV, *The Business of the Metaverse: How to Maintain the Human Element within This New Business Reality* (Routledge, Taylor & Francis Group 2024)

²⁸⁵ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

5.6.1. Reforming Design Registration Systems

IP authorities need to adapt to recognize and register digital only designs. A bridge was being opened to a new class for 'virtual goods' that could fill the legal gap.

5.6.2. Blockchain for Design Certification

Proof of first creation, proof of ownership, proof of modification, a timestamped ledger of what rights users have to the same virtual design could all be served by blockchain.²⁸⁶

5.6.3. Developing International Frameworks

Another option would be to capture the domain of virtual design protection and enforcement harmonization proposals in a new WIPO administered treaty or guidelines.²⁸⁷

5.7. Case Studies and Practical Examples

5.7.1. Fashion Industry in the Metaverse

- Roblox teamed up with Gucci to sell the virtual accessories.
- Nike sued unauthorized sellers of NFT sneakers and launched "Nikeland" virtual goods.²⁸⁸

5.7.2. Architecture and Virtual Real Estate

Many luxury virtual real estate projects on Somnium Space and other such platforms show unique designs which could rationally be copied or infringed upon without clear legal recourse.²⁸⁹

5.8. Conclusion

While the Metaverse is rising, there's a great risk of industrial design protection. The replication, alteration, and network of digital designs across decentralized virtual spaces is thought to be a task that traditional systems based on physical goods and national territories are not well suited for improving. Legal and technological reforms in the current context are required to protect creative expression on Metaverse and incentivize the innovation on the same. Industrial designs, at their core, dictates to the identity, branding and economic value of creators, place great risk of being defeated by a landscape in which they are positioned to flourish unless proactive steps are taken.

²⁸⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁸⁷ Kongolo T, *Intellectual Property and Emerging Technologies: Generated Global IP Issues and Challenges* (Routledge 2025)

²⁸⁸ Kongolo T, *Intellectual Property and Emerging Technologies: Generated Global IP Issues and Challenges* (Routledge 2025)

²⁸⁹ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

B. Patents:-

5.9. Introduction:

Throughout history patents have functioned as the main protection method which grants inventors sole ownership rights over new innovative industrial products. The establishment of the Metaverse presents obstacles for enforcing traditional patent doctrines due to its decentralized framework which creates immersive and persistent digital environments. Users along with developers together with platform operators find it difficult to enforce patent rights because virtual space lacks defined territorial limits.

5.10. Legal Framework for Patent Protection

5.10.1. Requirements for Patentability

Inventions have to meet the following three basic criteria under international standards, for example under the TRIPS Agreement and national patent laws, for them to be patentable, namely novelty, inventive step (non-obviousness), and industrial applicability. The innovations must be disclosed enough for replication; they are territorially limited as to protection.²⁹⁰

5.10.2. Scope of Patent Protection

A patent confers in the owner the sole right to practice the patent monopoly solely on making, using, selling, etc, the patented invention with or without authorization. Remedies such as injunctions and damages are also offered to remedy infringement.²⁹¹

5.10.3. Territoriality Principle in Patent Law

Territoriality is logically typical of patent rights, and thus, they can only be enforced in the jurisdiction in which the protection was granted. However, on the take the Metaverse is, activities typically remain on them beyond that of any one national boundary. This principle makes patent enforcement and enforcement in general in the borderless environment of the Metaverse complicated.²⁹²

²⁹⁰ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

²⁹¹ Rushing FW, *Intellectual Property Rights in Science, Technology, and Economic Performance International Comparisons* (Routledge 2022)

²⁹² Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

5.11. Patentable Innovations in the Metaverse

5.11.1. Virtual Reality and Augmented Reality Interfaces

Means of user interaction with Metaverse are innovation in immersive interfaces such as motion tracking instruments, VR headsets, gesture recognition and haptic feedback system etc. Most of these are patented technologies.²⁹³

5.11.2. Blockchain and Smart Contract Technologies

To facilitate decentralized ownership and transaction in the Metaverse, blockchain platforms and their coupled smart contract systems often rely on novel solutions that may be patentable from technical point of view, e.g., new consensus algorithms, transaction protocols.²⁹⁴

5.11.3. AI Systems in Virtual Worlds

They use proprietary AI including natural language processing, adaptive learning systems and so forth, in order to procedurally generate environments, autonomous avatars and intelligent NPCs (Non-Playable Characters).

5.11.4. 3D Modeling and Rendering Technologies

Technological companies patent such innovations that are part of the backbone for visually rich Metaverse experiences – innovations on the real time rendering, dynamic shading and also procedural asset generation.

5.12. Forms of Potential Patent Infringement

5.12.1. Unauthorized Use of Patented Technologies

Where patents comprise on Metaverse platforms, VR/AR devices, blockchain protocols, etc. they can provide services embodying patented inventions without getting appropriately licensed and in that, are direct infringement.²⁹⁵

5.12.2. Cross-Platform Implementation without Consent

The patented innovations in one Metaverse platform could be replicated to other Metaverse platforms without authorization making the control and monitoring of patent use difficult.

²⁹³ Rushing FW, *Intellectual Property Rights in Science, Technology, and Economic Performance International Comparisons* (Routledge 2022)

²⁹⁴ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁹⁵ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

5.12.3. Infringement by Users and Developers

Patented technologies may incidentally be integrated into virtual goods, games and service by end users and independent developers, potentially causing that end users, platforms (for example, by exposing platforms to secondary or contributory infringement liability).²⁹⁶

5.12.4. Indirect and Contributory Infringement

Even if they themselves are not the direct users, platform operators that help in developing, distributing, or commercializing infringing virtual products are held liable under indirect or contributory infringement doctrines.

5.13. Enforcement Challenges

5.13.1. Jurisdictional Complexity

When servers, users and developers are spread globally, it is problematic to determine where the infringement is located. One of the major hurdles is identifying the competent court and the law.²⁹⁷

5.13.2. Identifying Infringers in Anonymous Environments

Identity out of the real world slows litigation because of avatars and pseudonyms used by infringers.²⁹⁸

5.13.3. Technological Difficulty in Detecting Patent Use

Technically speaking, the backend systems like proprietary rendering engines or blockchain algorithms take efforts to detect infringement without leveraging the digital forensics.²⁹⁹

5.13.4. Weakness of Traditional Patent Remedies

When infringers trade pseudonymously, or somewhere awash with border, or utilize a platform immune to central judicial orders, injunctions and damages may be a poor remedy.³⁰⁰

²⁹⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁹⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

²⁹⁸ Rushing FW, *Intellectual Property Rights in Science, Technology, and Economic Performance International Comparisons* (Routledge 2022)

²⁹⁹ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

³⁰⁰ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

5.14. Legal and Policy Considerations

5.14.1. Patent Licensing Models for the Metaverse

Voluntary licensing schemes encouraged by platforms could provide FRAND (Fair, Reasonable and Non Discriminatory) licenses to integrate patented technologies in virtual environments.³⁰¹

5.14.2. Technological Standards and IP Pools

Regarding the Metaverse, one way to reduce infringement risks would be for technological standards and patents pools to develop around them.³⁰²

5.14.3. Role of International Institutions

WTO and WIPO are good bodies that can kickstart the model treaty or the dispute resolution mechanism for patent enforcement in virtual space.

5.15. Case Studies and Practical Implications

5.15.1. Oculus VR Litigation

Immersion interface technologies have huge commercial stakes as is best demonstrated by Facebook's Oculus VR being sued for patent infringement against its VR headset technologies.

5.15.2. Hypothetical Scenarios

In a Metaverse platform, if smart contracts are deployed which implement patented protocols and which do not however have a licensing agreement then mass infringement could be achieved through their use.³⁰³

5.16. Conclusion

Essential to protecting technological innovation, patents are also at risk to be unenforceable in the Metaverse. Without proactive adapting of legal framework, due to the borderless, decentralized, pseudonymous nature of virtual worlds the rights of patent holders may be undermined. To continue the growth of the Metaverse should also mean preserving the incentives to innovate, and so requires a combination of legal reform, international cooperation, and technical innovation.

³⁰¹ Rushing FW, *Intellectual Property Rights in Science, Technology, and Economic Performance International Comparisons* (Routledge 2022)

³⁰² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³⁰³ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

C. Geographical Indication

5.17. Introduction:-

Geographical Indications (GIs) are one form of intellectual property, the protection of which is aimed at the names and signs used to designate goods as originating in a certain place where a certain quality, reputation or other characteristic of the good is primarily due to its geographical origin. Such examples are Champagne (France), Darjeeling Tea (India) and Parmigiano Reggiano (Italy).

Across virtual marketplaces and immersive environments utilising geographical indications in the Metaverse, there is a challenge that is unique with regards to the way in which geographical indications are being misused. Virtual sellers and platforms may market digital goods of celebrated GIs without respect to quality, origin or the traditional standards which GIs were to protect. In the case of decentralized and borderless architecture of Metaverse, this chapter enquires how this disrupts traditional GI protection and enforcement.

5.18. Legal Framework for Geographical Indications

5.18.1. Definition and Requirements for Protection

According to the TRIPS Agreement (Article 22), indicators identifying a good as originating from a territory (at the time) causing a given quality, reputation, or other characteristic to be essentially attributable thereto, irrespective of the time, shall enjoy adequate protection in the country of origin in respect of such indications.³⁰⁴

However, GIs generally protect the product originating from the designated place if its use misleads the consumer in view of the reality of the product.³⁰⁵

5.18.2. Enforcement Mechanisms

Protection of resulting from national laws, regional systems (or example EU GI Regulation), and international agreements, provides remedies to the form, such as injunctions, seizure, and damages for the misrepresentation or dilution of reputation.³⁰⁶

³⁰⁴ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

³⁰⁵ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

³⁰⁶ Steven Wilf, *Intellectual Property Law and History* (Routledge)

5.19. Use of GIs in the Metaverse

5.19.1. Digital Products and Virtual Shops

Virtual environments enable creating digital wine bottles labeled as “Champagne,” virtual cheese shops showing “Roquefort,” or online galleries selling virtual “Darjeeling Tea”. In the purely digital setting in which none of the physical goods is sold (i.e. when GI tagged terms are used), novel enforcement difficulties arise.³⁰⁷

5.19.2. Branding and Virtual Identity

Symbolic and reputational value is attached to GIs. In the Metaverse, the goodwill where virtual goods referencing famous regions can exploit it without authentic linkage to the production process or to region can mislead the consumers regarding authenticity.³⁰⁸

5.19.3. Virtual Experiences and Tourism

Further issues are generated by virtual reality based tourism (e.g., virtual tourism to a digital replica of Bordeaux vineyards) when virtual experiences distort real world GIs or when virtual experiences allow unauthorized commercialization of cultural assets.³⁰⁹

5.20. Forms of Potential Infringement

5.20.1. Misuse of GI Terms for Non-Authentic Digital Goods

It's abuses of GIs because buying a ‘Champagne NFT’ or going to a ‘Darjeeling Tea Room’ without any trace of where this comes from is misusing GIs and is an attack on who it is meant to protect.³¹⁰

5.20.2. Dilution of Reputation

One of GI's specific terms is easy to lose its original meaning and touch due to its frequent abuse in the Metaverse by the unauthorized translators, who weaken the exclusive engagement with a well-defined area.³¹¹

5.20.3. Unauthorized Licensing and Imitation

GIs may be used by purely virtual shops in advertising or in domain names without the permission of legal owners of GIs.³¹²

³⁰⁷ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

³⁰⁸ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³⁰⁹ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

³¹⁰ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

³¹¹ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

³¹² KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

5.20.4. False Attribution and Consumer Confusion

Consumers may be misled into believing that digital experiences or products are so product or come from protected areas.³¹³

5.21. Enforcement Challenges

5.21.1. Lack of Physical Goods and Traditional Quality Controls

GI protections have been created based on physical goods produced through certain production methods. Goods in the Metaverse are digital so it makes the traditional quality control and certification schemes challenging especially in regard to movement of goods.³¹⁴

5.21.2. Jurisdictional Barriers

Due to it being decentralized and borderless, It becomes difficult to determine the jurisdiction. Upon whom jurisdiction it falls under, it is crucial concern to consider.³¹⁵

5.21.3. Platform Governance and Limited Liability

Under their Terms of Service, platforms hosting virtual shops or events may disclaim responsibility for infringement of users' GIs.

5.22. Legal and Policy Considerations

5.22.1. Adapting GI Laws to Virtual Goods

However, legal reforms would clarify that the digital representations of GI protected goods and services are still protected by the rights already established under the GI traditions, even if no physical good is involved in the transaction.

5.22.2. Certification and Authentication in the Metaverse

Virtual goods related to GIs could be certified via blockchain-based methods in order to authenticate the assets, and tied back to the original producers.³¹⁶

5.22.3. International Cooperation for Virtual GI Enforcement

Harmonization of standards and enforcement procedures across borders by WIPO or WTO led initiatives is possible in digital environments for the protection of GIs.

³¹³ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³¹⁴ Booton D and Prime T, *European Intellectual Property Law* (Routledge 2018)

³¹⁵ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³¹⁶ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

5.23. Case Studies and Hypothetical Scenarios

5.23.1. Potential Misuse in Virtual Marketplaces

- Two virtual shops dealing in “Champagne NFTs” that were minted without authorization.
- Unauthorized “Darjeeling Tea” branding in avatar accessories against the backing of Decentraland.³¹⁷

5.23.2. Lessons from Real-World GI Enforcement

Nearby application of real world GI misappropriation case (e.g. Champagne in the US market) to predict challenge in the virtual economy.³¹⁸

5.24. Conclusion

The Metaverse will bring a new impact on the misappropriation and dilution of geographical indications, which is very high risk to the authenticity, the quality assurance, as well as to the consumer trust. In the digital ecosystems, traditional GI protections: built on basis of physical production and goods, have to mutate.

Accordingly, legal reforms and technological adaptations (for instance, blockchain verification) and stronger international collaborations will be needed to maintain cost saving and cultural hybridisation in the contexts of GIs in virtual worlds. Without these efforts geographical indications could lack the reputation, heritage and commercial values that attach to them in the opening up of the frontier of the Metaverse.

³¹⁷ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³¹⁸ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

D. Trade Secrets:-

5.25. Introduction

Similarly to patents and copyrights, trade secret protects confidential information of a business that gives it value to be kept in secret. Examples include algorithms, business strategies, manufacturing process, client lists, software codes. Where there is the Metaverse creating decentralized, immersed and highly collaborative digital environments, trade secrecy becomes an even more difficult matter.

Thus, this chapter explores how the exposure of trade secrets to new risks of misappropriation, leakage, and unauthorized use arises from a consideration of trade secrets and the characteristics of the Metaverse, namely, anonymity, decentralization, interoperability, and persistent collaboration. In addition, it discusses enforcement problems and legal and technological solutions.

5.26. Legal Framework for Trade Secret Protection

5.26.1. Definition and Requirements for Protection

Trade secrets are protected based on the following criteria:

- The information must be secret (not generally known or easily ascertainable).
- It must have commercial value because it is secret.
- The rightful owner must have taken reasonable steps to maintain its secrecy.³¹⁹

Protection is not dependent on registration but relies on confidentiality measures and contractual obligations.

5.26.2. Enforcement Mechanisms

Under US Defend Trade Secrets Act (DTSA) and EU Trade Secrets Directive, there are remedies against unlawful acquisition, use or disclosure including injunctions, damages and seizure orders.³²⁰

5.27. Nature of Trade Secrets in the Metaverse

5.27.1. Types of Trade Secrets in Virtual Environments

- Rendering, motion tracking and immersive interaction backend algorithms.

³¹⁹ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

³²⁰ Breakey H, *Intellectual Liberty: Natural Rights and Intellectual Property* (Routledge 2016)

- Delegated code based decentral platforms.
- AI models running proprietary avatars, NPC's.
- Virtual marketplace recommendation algorithms.
- Business strategies for in-world marketing, virtual real estate management, and virtual goods monetization.³²¹

5.27.2. Value of Trade Secrets in Immersive Economies

Trade secrets in the Metaverse are business advantages in a rapidly changing business sector. For instance, real world vantage points can be added to an avatar in a AI which takes them to a new level of realism given large enough purchase prices, and such an AI could do so in a proprietary way and thus demand a large commercial value for a platform.³²²

5.28. Forms of Potential Misappropriation

5.28.1. Unauthorized Access and Hacking

As indicated by the term itself, virtual environments are prone to cybersecurity vulnerabilities.³²³

Backend databases containing protected source codes, user data and algorithms may be exposed to hackers.³²⁴

5.28.2. Insider Threats and Virtual Collaboration Risks

Co-creation spaces and open development communities (DAOs) etc. may or have to reveal their confidential information to collaborators, whose actions may misuse such confidential information later.

Internal leaks are harder to control over virtual teams, because they have weak internal controls.³²⁵

5.28.3. Smart Contract Exploitation

If not well secured, smart contracts unintentionally expose sensitive operational parameters that should have been kept secret.³²⁶

³²¹ Gallagher WT, *Intellectual Property* (Taylor & Francis (CAM) : Routledge 2017)

³²² Breakey H, *Intellectual Liberty: Natural Rights and Intellectual Property* (Routledge 2016)

³²³ Taplin R, *Artificial Intelligence, Intellectual Property, Cyber Risk and Robotics: A New Digital Age* (Routledge 2023)

³²⁴ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

³²⁵ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

³²⁶ KALPOKAS I, *Regulating the Metaverse: A Critical Assessment* (ROUTLEDGE 2024)

5.28.4. Reverse Engineering in Decentralized Platforms

Under such a circumstance, users and competitors may reverse engineer and decompile digital goods, smart contracts, and so on.

5.29. Enforcement Challenges

5.29.1. Anonymity and Decentralization

When transactions and communications happen pseudonymously, it is hard to know who exactly is the perpetrator of a trade secret breach. DAOs are not centralized accountable, making them difficult to be sued.³²⁷

5.29.2. Cross-Border Jurisdictional Barriers

Trade secret laws are jurisdictional. It makes the choice of applicable law and the alternative of enforcement venue more difficult to prove misappropriation where information crosses borders.³²⁸

5.29.3. Proving Misappropriation

It is very difficult to demonstrate that confidential information was used unlawfully, both in a technological and legal sense.

The strength of transparent blockchain makes it easier to trace but harder to prove unauthorized exploitation.³²⁹

5.30. Legal and Policy Considerations

5.30.1. Strengthening Virtual Confidentiality Protocols

It is essential for platforms and companies to enforce the strict encryption, secure smart contracts and access control. They should explicitly include virtual assets and collaborative spaces within the provisions for the confidentiality agreement.³³⁰

5.30.2. Cross-Border Cooperation

Trade secret rights may need to be recognized and enforced through a number of international treaties or model laws.

³²⁷ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

³²⁸ Breakey H, *Intellectual Liberty: Natural Rights and Intellectual Property* (Routledge 2016)

³²⁹ Dagur A and others (eds), *Artificial Intelligence, Blockchain, Computing and Security*, vol 2 (Taylor and Francis)

³³⁰ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

5.30.3. Role of Blockchain and Encryption

Proof of ownership and secretive protecting may have come with blockchain based timestamping and encryption of sensitive transactions.³³¹

5.31. Case Studies and Practical Implications

5.31.1. Real-World Examples

Behind this are instances of hacking in gaming platforms, NFT marketplaces, and decentralized finance (DeFi) projects which indicate their vulnerabilities.³³²

5.31.2. Hypothetical Scenarios

- Unauthorized disclosure of a proprietary VR rendering engine by an anonymous DAO contributor.³³³
- Misuse of a confidential virtual advertising algorithm in competing Metaverse platforms.³³⁴

5.32. Conclusion

As to date, trade secrets are one of the least protected categories of IP in the Metaverse. There is the architecture of virtual worlds that is decentralized, anonymous, persistent, and globally accessible and increases the risk of misappropriation and decreases effectiveness of traditional enforcement models. To protect confidential innovations in the digital frontier of very new and very young digital interaction, new legal instruments as well as technological solutions, such as blockchain certification and AI detection tools, must be deployed.

Ensuring trust, creating innovation and sustaining economic growth in such immersive virtual ecosystems is not only a technical challenge but is of security of trade secrets in the Metaverse.

³³¹ Breakey H, *Intellectual Liberty: Natural Rights and Intellectual Property* (Routledge 2016)

³³² Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

³³³ Benítez Rojas RV, *The Future of Digital Communication: The Metaverse* (CRC Press 2024)

³³⁴ Baral SK and others, *Green Metaverse for Greener Economies* (CRC Press, Taylor & Francis Group 2024)

CHAPTER VI: CONCLUSION, FINDINGS & PROPOSED LEGAL REFORMS

6.1. Conclusion:-

Current intellectual property frameworks encounter significant challenges because the fast advancement of Metaverse technologies transforms digital ownership systems together with creative processes. The present study aimed to assess the suitability of current IP laws that were developed for physical bounded territories in handling the borderless environments of the Metaverse.

This work undertook a dual purpose to discover essential legal deficiencies as well as evaluate legal enforcement barriers to develop practical reforms protecting IP in virtual environments properly and equitably. The findings of this research are analyzed in detail through legal and policy suggestions while suggesting possible future investigation directions in this chapter.

6.2. Findings:-

Traditional IP systems which operate on territoriality and human authorship principles plus physical fixation standards demonstrate growing difficulty when used for Metaverse protection. The Metaverse presents obstacles to jurisdictional enforcement because its decentralized structure combines blockchain and smart contracts in its operations.

The territorial boundaries which define physical worlds do not exist in virtual domains resulting in serious uncertainty regarding what laws apply for resolving disputes and where they should be resolved.

The decentralized autonomous organizations (DAOs) operating in the Metaverse disrupt traditional methods of accountability and responsibility definitions. DAOs enable democracy but distribute power among multiple entities which makes tracking culprit legal persons who commit IP infringements an intricate task.

The research findings show trademark, copyright, patent and industrial designs together with trade secrets and geographical indications encounter distinct and serious exposures in digital spaces. The processes for illegal activity remain simple yet identifying lawbreakers proves difficult along with poor existing enforcement systems.

The rapid growth of NFTs and AI-generated content with decentralized virtual platforms has introduced new type of IP infringements while outpacing established regulation.

6.3. Key Observations by IP Category

Trademark regulations encounter impediments due to unapproved mark applications in virtual items together with avatar decoration and NFT implementation. The MetaBirkins case demonstrates how virtual marketplaces make brand dilution and consumer confusion reach their peak levels. The way people understand source identification and confusion marks ought to transform to meet demands of interactive and immersive environments.

Copyright law deals with difficulties identifying creators and creators of original work particularly during the production of AI-made virtual environments and real-time dynamic events. Copyright protection faces serious challenges because virtual worlds have an evanescent structure which prevents stakeholders from fixing intellectual property to determine authorship ownership.

The enforcement of patent laws becomes complicated since innovations concerning VR interfaces blockchain protocols along with AI algorithms create problems by freely moving between different platforms and jurisdictions beyond central controlling bodies' oversight. As a result of patent rights being territorial entities they spark difficulties in connection to both enforcement and remedies across the global Metaverse infrastructure.

The illegitimate copying and distribution of industrial designs which support virtual inventions results in widespread unethical behavior online. Digital designs currently experience reduced safety because such protection remains undefined.

The decentralized ecosystem makes trade secrets that include proprietary algorithms as well as smart contracts and virtual business models highly susceptible to theft. Virtual anonymity throughout open-world systems and the collaborative experience leads to higher chances of protection breaches.

Erroneous virtual market applications of traditional geographical indications like "Champagne" or "Darjeeling Tea" reduce their value due to unethical product placements without meeting standard production methods.

6.4. Identified Gaps in Current Legal Frameworks

The analysis revealed essential deficiencies when implementing conventional IP laws towards the Metaverse. The clash between physical place-based rights protection (territoriality principle) stands as the foremost issue because virtual spaces lack geographical constraints. Right protection faces complete implementation challenges when there is no defined area of authority.

Legal definitions are nonexistent for virtual property rights which include digital land as well as avatars and NFTs. The Metaverse lacks globally accepted rules for obtaining digital evidence needed to resolve IP conflicts that happen within this virtual realm.

The absence of established legal principles concerning platform and DAO responsibility creates difficulties for right owners to pursue compensatory action when infringements take place. A lack of applicable law allows unauthorized infringement which weakens the worth of protected IP assets.

6.5. Proposed Legal Reforms and Policy Recommendations

The dissertation presents precise reforms which aim to resolve these existing gaps. National along with international governing bodies need to establish Metaverse legal definitions to recognize virtual goods as well as avatars and NFTs together with decentralized platforms as objects protected by IP rights.

IP categories need to evolve to comply with the digital environment. Virtual goods together with services need explicit classification under trademark classes that follow the NICE Agreement. Law regarding copyright authorship needs reform because it should acknowledge group contributions for constantly active virtual content.

Cross-border enforcement procedures need to be created as a new system for its effective operation. WIPO and WTO should use their international frameworks to set virtual environment jurisdictional rules and virtual IP recognition protocols while creating International Virtual IP Tribunals (IVIPTs) for dispute resolution.

Fourth, technological integration is crucial. The registration process along with IP rights licensing and evidence conservation for IP ownership should utilize Blockchain technology as a platform. Legally binding recognition of smart contracts should be obtained before automated royalty payments and licensing safeguards become possible.

The regulations governing decentralized governance must be established. The law should require DAOs and Metaverse platforms to set up clear procedures for IP compliance which contains takedown protocols alongside reporting and dispute resolution methods.

The protection of trade secrets along with geographical indications calls for particular implementation strategies. The validity of virtual GIs can be authenticated through blockchain-based certification systems together with virtual non-disclosure agreements that unite with encrypted smart contracts for decentralized collaboration protection.

6.6. Future Research Directions

Research dedicated to Metaverse IP crime liability requires attention because of existing technological changes as these investigations should focus on unauthorized copyright use together with fraud and piracy violations. Researchers make progress in creating innovative systems that manage IP ownership for AI-elevated work generation. Research on new Metaverse rules from the EU Digital Services Act alongside the UAE Metaverse Strategy 2030 and South Korean Virtual Economy Law would show methods to succeed while avoiding potential difficulties.

6.7. Final Reflection

Through the Metaverse people can unlock endless opportunities including creative exploration of innovation and economic expansion. Lacking proper legal frameworks transforms the Metaverse into a place where intellectual labor values fade into worthlessness. In order to maintain their effectiveness in virtual worlds intellectual property rights need adjustments to their original form.

The workforce needs resilient legal structures for the Metaverse which must be built now by lawmakers along with policymakers and scholars who will anticipate upcoming challenges. The Metaverse requires systematic legal protection of innovation alongside trust-building mechanisms and fair practices because these principles represent both technological necessities and moral as well as economic standards of the digital age.

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