EXPLORING THE IMPACT OF NON-FUNGIBLE TOKENS ON THE PROTECTION AND MANAGEMENT OF INTELLECTUAL PROPERTY RIGHTS: AN ANALYSIS

Dissertation submitted to National Law University and Judicial Academy, Assam

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June, 2023

CERTIFICATE

This is to certify that **NILIM SARMA** has completed his dissertation titled "**EXPLORING THE IMPACT OF NON-FUNGIBLE TOKENS ON THE PROTECTION AND MANAGEMENT OF INTELLECTUAL PROPERTY RIGHTS: AN ANALYSIS**" under my supervision for the award of the degree of **ONE YEAR LL.M. DEGREE PROGRAMME** of National Law University and Judicial Academy, Assam.

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DECLARATION

I, **NILIM SARMA**, do hereby declare that the dissertation titled "**EXPLORING THE IMPACT OF NON-FUNGIBLE TOKENS ON THE PROTECTION AND MANAGEMENT OF INTELLECTUAL PROPERTY RIGHTS: AN ANALYSIS**" submitted by me for the award of the degree of **ONE YEAR LL.M. DEGREE PROGRAMME** of National Law University and Judicial Academy, Assam is a bona-fide work and has not been submitted, either in part or full anywhere else for any purpose, academic or otherwise.

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SL. NO.	ABBREVIATIONS	MEANING
1.	Anr.	Another
2.	DAO	Decentralized Autonomous Organization
3.	Ed.	Edition
4.	ERC	Ethereum requests for comment
5.	Et al.	Et alia
6.	HC	High Court
7.	IOT	Internet of Things
8.	IP	Intellectual Property
9.	IPFS	Interplanetary File System
10.	IPR	Intellectual Property Rights
11.	IT	Information Technology
12.	NFTs	Non- Fungible Tokens
13.	P2P	Peer to Peer
14.	Rev.	Review
15	SC	Supreme Court
16.	TRIPs	Trade related to Intellectual Property Rights
17.	U.S.C.	United States Code
18.	WIPO	World Intellectual Property Organization.

CHAPTER - 1

INTRODUCTION

In recent years, unconventional digital assets and virtual currencies have emerged in the global market. Non-Fungible Tokens (NFTs) have revolutionized the virtual digital asset sector. Despite being initially developed in the early 2000s, non-fungible tokens (NFTs) experienced a surge in prominence within the technology industry after their introduction via the Crypto Kitties game by Dapper Labs in 2017[1]. The occurrence generated a considerable level of public interest, culminating in the purchase of Crypto Kitties exceeding 2 million by Dapper Labs. Non-fungible tokens (NFTs) have brought about a significant transformation in the understanding of ownership and authenticity within the digital domain. NFTs offer a decentralized and tamper-proof means of documenting ownership for digital assets through the utilization of blockchain technology. The implications of this extend beyond the realm of art, as non-fungible tokens (NFTs) have the potential to be utilized in various digital assets such as music, videos, virtual real estate, and even virtual identities. Non-fungible tokens (NFTs) afford individuals the ability to establish the distinctiveness and genuineness of their digital assets, thereby engendering a perception of limited availability and selectiveness that was hitherto difficult to attain within the digital realm.

The transformative impact of NFTs on the art market is one of the primary factors driving their rise in popularity. For an extended period, individuals involved in the field of digital art encountered difficulties in generating revenue from their creations and encountered obstacles in establishing the ownership and legitimacy of their works. Non-fungible tokens (NFTs) have significantly transformed the artistic domain by offering a secure and transparent medium through which artists can vend and verify their digital creations. Contemporary artists can tokenize their artwork, thereby establishing a system of verifiable ownership, and engaging directly with collectors and enthusiasts, effectively

[1] Tomio Geron, 'How Dapper Labs scored NBA crypto millions' (*Protocol*, 13 March, 2021) <https://www.protocol.com/fintech/dapper-labs-nba-top-shots> accessed 4 May 2023.

circumventing the involvement of conventional intermediaries.[2] The increased accessibility and enhanced opportunities for direct engagement have not only bestowed artists with greater agency, but have also enticed a fresh cohort of art enthusiasts and collectors.

In contemporary times, Non-Fungible Tokens (NFTs) have exerted a significant influence on the art industry, as evidenced by the multi-million-dollar sales of artworks, thereby surpassing the worth of conventional fine art. The artwork titled "Everydays: The First 5,000 Days" by Beeple was sold as a non-fungible token (NFT) for an impressive sum of $69 million by Christie's, a renowned auction house. Furthermore, the Chief Executive Officer of Twitter, Jack Dorsey, conducted an auction for the initial tweet posted on the platform, selling it as a non-fungible token (NFT) and garnering a sum exceeding $2.9 million. The NBA Top Shot marketplace, which is under the ownership of Dapper Labs, has achieved a sales figure surpassing $500 million, thereby establishing itself as the most prosperous NFT marketplace to date. The proliferation of non-fungible tokens (NFTs) has not been confined to Western nations alone, but has also exerted a significant influence on India. Esteemed personalities such as Amitabh Bachchan, who garnered a revenue of more than 70 million rupees from the sale of his NFT collection[3], and Rohit Sharma, the captain of the Indian cricket team, who intends to introduce his own NFT collection[4], have adopted this phenomenon. Non-fungible tokens (NFTs) have caused significant disruption in several sectors, such as the entertainment and sports industries. The objective of this research endeavor is to address the fundamental inquiries pertaining to Non-Fungible Tokens (NFTs) and their sales that have reached millions of dollars. The text undertakes an examination of the notion of non-fungible tokens (NFTs), conducts an in-depth exploration of the legal ramifications associated with IPR, and scrutinizes the influence of NFTs on the marketplace.

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[2] Abhishek Sharma, 'Interrelationship between Non-Fungible Token and Intellectual Property Rights: A Study' (LL.M. Dissertation, National Law University and Judicial Academy, Assam 2022) <http://www.dlnluassam.ndl.iitkgp.ac.in/> accessed 4 May 2023.

[3] Shubham Raj, 'Amitabh Bachchan's NFT collection sold for Rs 7.18 crore' (*The Economic Times* 5 November, 2021) < https://economictimes.indiatimes.com/markets/cryptocurrency/amitabh-bachchans-nft-collection-auctioned-at-record-1-million/articleshow/87539323.cms?from=mdr> accessed 4 May 2023.

[4] Jigyanshushri Mahanta, 'Rohit Sharma Announces NFT Collection Inspired by Personal Memorabilia on FanCraze' (*Republic World* 25 December, 2021) < https://www.republicworld.com/sports-news/cricket-news/rohit-sharma-announces-nft-collection-inspired-by-personal-memorabilia-onfancraze.html> accessed 4 May 2023.

The scholar examines the legal implications associated with non-fungible tokens (NFTs), including copyright infringement, ownership implications, appropriation of art, trademark infringement, and copyfraud, among others. The dissertation offers insights into the operational mechanisms of non-fungible tokens (NFTs) that rely on blockchain technology, while also scrutinizing the diverse facets of intellectual property rights.

This study provides a thorough investigation aimed at comprehending the mechanisms of NFTs and their impact on the realm of intellectual property rights. This study delves into the intricacies of blockchain technology, explores the constituent elements of non-fungible tokens (NFTs), analyses their distinguishing features, examines their various applications, and assesses their widespread appeal. Moreover, the text underscores concerns pertaining to intellectual property rights and violations, referencing pertinent legal cases concerning NFTs. The study encompasses IP management, with a specific emphasis on IP allocation. The text undertakes a critical analysis of the current legislation pertaining to NFTs, highlighting areas of insufficiency, and proposing recommendations to enable NFT creators to optimize the worth of their products and make positive contributions to the technological ecosystem, while avoiding legal challenges associated with NFTs.

The present study endeavors to examine the intricate legal issues that are linked with non-fungible tokens (NFTs) and their impact on the domain of intellectual property rights (IPR) law. This study delves into the unique legal ramifications that emerge as a result of utilizing non-fungible tokens. These implications encompass matters such as copyright violation, ownership deliberations, art appropriation, trademark infringement, and copyfraud. Through a comprehensive analysis, this research endeavor aims to elucidate the intricacies and legal implications of NFTs.

The article not only addresses the legal implications of non-fungible tokens (NFTs), but also provides insight into the fundamental technology that underpins them, namely blockchain. This piece of writing delves into the fundamental constituents and mechanisms of blockchain technology, elucidating its significance in facilitating non-fungible tokens (NFTs). Acquiring this knowledge is imperative for understanding the

distinct attributes and traits of non-fungible tokens (NFTs), along with the underlying factors contributing to their extensive prevalence.

As the research advances, it draws attention to the convergence of NFTs and IPR. This study analyses prominent intellectual property rights legislation and their potential effects on non-fungible tokens. Through an examination of pertinent NFT-related cases, the present study demonstrates the potential for both safeguarding and violation of IPR in the realm of NFTs.

The study explores the administration of intellectual property concerning non-fungible tokens (NFTs), specifically emphasizing IP allocation. This paper delves into the complexities and deliberations surrounding the allocation of intellectual property rights to non-fungible tokens (NFTs), providing valuable perspectives and suggestions for innovators, and interested parties within the technological sphere.

The research work undertakes a critical evaluation of the current legislation and identifies potential gaps in the legal framework pertaining to NFTs. The research endeavors to make a contribution to the current discourse on non-fungible tokens (NFTs) by identifying and emphasizing the existing gaps in the legal framework. The aim is to provide recommendations that can effectively address these legal loopholes. The ultimate goal is to guarantee that creators of non-fungible tokens (NFTs) can fully reap the rewards of their artistic endeavors while adhering to legal regulations.

This study provides a thorough investigation of non-fungible tokens (NFTs), encompassing their technological foundations, legal ramifications, and influence on intellectual property rights. The objective is to tackle fundamental inquiries, rectify misunderstandings, and provide direction for maneuvering the dynamic domain of NFTs while preserving the rights to intellectual property.

1.1 Statement of Problem

In recent years, there has been a significant increase in the recognition of NFTs among the general public, despite their previous lack of recognition. The heightened awareness among the general populace can be attributed to their association with diverse digital assets, such as digital art, which are frequently traded at exorbitant valuations.

However, there exist divergent perspectives on Non-Fungible Tokens. NFTs are being regarded as a supportive mechanism with significant potential to catalyze a transformative impact by encouraging digital artists, enhancing income streams, and restructuring the digital art markets. On the opposite end of the spectrum, they are perceived as a prime example of how technology can have significant and transformative legal ramifications on the field of copyright law.

The utilization of these tokens can result in diverse legal implications pertaining to copyright regulations. From a certain perspective, these entities can be regarded as a recent illustration of the potential advantages and disadvantages inherent in the utilization of distributed ledger technology within the realm of copyright law, specifically in the context of the relationship between digital artists and copyright holders.

A dispute has arisen between NFT creators and intellectual property rights holders regarding ownership of the intellectual property rights associated with NFTs. The issue at hand stems from the absence of legislation that oversees or manages the legal aspects pertaining to non-fungible tokens (NFTs), coupled with inadequacies of existing IPR framework in addressing the intricacies of NFTs.

Hence, to address the issue of IPR infringement concerning NFTs and to establish control over the commercialization of NFTs, it is imperative to synchronize the domestic and international standards and devise a supervisory structure at the organizational level for both stages. This will ensure consistency and enable the fulfilment of these requirements.

1.2 Aim(s)

This research study aims at comprehensively examining the emergence and growth of NFTs in the global landscape. It seeks to determine the diverse legal implications associated with NFTs and propose recommendations considering these findings. Additionally, the research aims to evaluate whether there is a requirement for new legislation to effectively address the intellectual property (IP) aspects concerning NFTs or if the existing legal framework adequately addresses these concerns.

1.3 Literature Review

[1] In his book[5], Dr. **VK Ahuja** provides a comprehensive and insightful analysis of the various manifestations of intellectual property rights (IPR). The author of this book has comprehensively addressed the pertinent and significant subjects pertaining to the diverse rights encompassed within intellectual property rights (IPR). The book has proven to be highly beneficial for the researcher in comprehending the various concepts pertaining to Patents, Copyright, Trademark, and other related subjects. Chapter 73 of the present book is specifically devoted to the licensing dimension of intellectual property rights (IPR) management. After perusing this book, the researcher has acquired a comprehensive understanding of the various manifestations of intellectual property rights (IPR). Certain aspects of copyright protection and the impact of its infringement have been elaborately discussed in the book and has helped the researcher to understand the fundamentals of copyright, along with other Intellectual Property Rights.

While discussing the Indian Perspective of IPR infringement in certain cases the book provided detailed description of the remedies and helped the researcher in forming objective inferences pertaining to such legal cases.

[5] Ahuja V.K, *Law Relating to Intellectual Property Rights* (3rd Edition, Lexis Nexis 2017)

[2] In his article[6] **Peter Altmann** discussed broadly about the scope and limitations of blockchain technology. While providing an overview of blockchain technology the author delves into the implications of blockchain in the future and its impact on protecting and managing IPR. Certain characteristics of blockchain technology is discussed in the article which has helped the author in understanding what makes blockchain technology different and more efficient than existing technologies.

The aspect of transparency and trust in the technology of blockchain has been deeply investigated and has provided the researcher with a clear understanding of the benefits of this technology.

The author has also investigated the circumstances where the blockchain technology may fall short in its application. This has greatly benefited the researcher in maintaining an educated and non-biased view of this complex technology.

[3] In the context of blockchain technology, such as cryptocurrencies and smart contracts, intellectual property (IP) law presents unique challenges and opportunities. The article[7] by **Gonenc Gurkaynak**, titled "Intellectual property law and practice in the blockchain realm" explores these issues in depth.

The article delves into legal frameworks and practices surrounding IP protection in the blockchain realm, including discussions on jurisdictional issues, challenges in enforcement, and emerging strategies to protect IP rights. It also examines potential conflicts between blockchain's characteristics, such as immutability and transparency, and the need to safeguard sensitive IP information.

Such detailed analysis of the blockchain technology and its IP implications provide the researcher with a knowledge base that has helped in the formulation of chapters in this research work.

[6] Peter A., '(How) Can blockchain technology enhance trust?' (ResearchGate March 2019)
[7] Gurkaynak G, 'Intellectual property law and practice in the blockchain realm' (34 CLSR 2018)

[4] This article[8] by **Simanta Sarmah** provides a general overview of blockchain technology and helps in understanding its fundamental concepts and implications. The characteristics of blockchain and how each of these characteristics make the technology unique have been discussed in detail in this article. The author provides various statistical data along with simple pictographical representation of complex concepts which has helped the researcher to understand the technology behind blockchain. The use case of blockchain technology along with real life examples that have been provided in the article adds to the lucidity and credibility of the research work.

[5] In this article[9] by **Keyur Asarkar**, the legal implications of NFTs on IPR have been discussed. The legal dispute arising out of the interplay of these two concepts are analyzed and has helped the researcher in analyzing the pertinent case studies. Recent and significant legal cases like the Miramax v. Tarantino case have been analyzed and the legal ramifications discussed in a comprehensive manner. Such analysis provides the researcher with real life circumstances where NFTs pose a challenge to the existing legal framework dealing with IP protection.

1.4 Objective(s)

The objectives of this research are as follows:

- To examine the emergence of non-fungible tokens within the digital realm.
- To identify gaps in the execution of the entitlements of non-fungible token proprietors in the context of commercialization.
- To determine if any extant intellectual property legislation can confer safeguarding measures to non-fungible tokens (NFTs).
- To conduct an analysis of the diverse judicial rulings that pertain to non-fungible tokens (NFTs).
- To determine the potential applicability of the fair use doctrine in the context of NFT appropriation.

[8] Sarmah S., 'Understanding Blockchain Technology' (Researchgate August 2018)
[9] Keyur Asarkar, 'Non-Fungible Tokens (NFTs) – An IPR Perspective' (2022) 4 (1) IJLSI

- To inquire whether comparison can be made between digital artworks or non-fungible tokens (NFTs) and conventional artworks.
- To determine whether the proprietor of the NFT acquire the copyright to the fundamental aspects of the work.

1.5 Scope and limitations

This study has a limited scope which attempts to comprehend the underlying factors contributing to the surge in Non-Fungible Tokens' prominence, as well as to elucidate the operational mechanism of NFTs and scrutinize the diverse legal ramifications associated with them. As a result of temporal and financial constraints, the researcher has restricted the scope of the study solely to examining the prospective ramifications on Intellectual Property Rights arising from the utilization of NFTs.

1.6 Research Questions

1. Can the intellectual property rights regime provide safeguarding measures for owners of non-fungible tokens (NFTs)?
2. What will be the impact of emergence of NFTs on the economic rights of intellectual property rights (IPR) holders?
3. Can the implementation of a *sui generis* law effectively mitigate the issue of misappropriation and safeguard NFTs?
4. Can the principle of fair dealing/use be invoked in cases involving NFT appropriation?

1.7 Research Methodology

Doctrinal research has been adopted by the researcher, in this research work.

Research which is known as Doctrinal Research bears resemblance to a library-intensive study, in where the researcher relies on the availability of research materials and resources in libraries, archives, and other databases. In addition, the researcher utilized a variety of literature sources to obtain reliable data that was imperative for the completion of this project. Simultaneously, the researcher utilized computer laboratories to obtain research materials pertaining to the subject matter of this seminar paper. The utilization of

diverse reputable websites by the researcher was pivotal in achieving a comprehensive comprehension of the topic at hand. The method of citation used in this research work is OSCOLA (4th edition).

1.8 Chapterisation

This study examines the legal considerations surrounding non-fungible tokens (NFTs) and endeavors to elucidate the ambiguities surrounding NFTs by scrutinizing their various facets in conjunction with laws governing copyright. Seven chapters have been discussed in this dissertation and their details have been explained in brief as follows:

Chapter I – Introduction

This chapter provides a broad view of the research, including an introduction to NFT, literature review, the establishment of objectives, the formulation of research questions, and the identification of the methodology employed. In addition, the statement of problem that is being dealt with in this dissertation has also been mentioned in this chapter by the researcher.

Chapter II – Understanding Blockchain Technology and Non-Fungible Tokens

This subsequent chapter of the study provides a conceptual comprehension of blockchain technology, elucidating its operational mechanisms and functionalities. The researcher emphasized the importance of comprehending the basic knowledge of technology relating to blockchain that underlies non fungible tokens in order to gain a better understanding of the latter. The author in this chapter expounded upon the diverse elements of blockchain technology, including but not limited to mining, p2p networks, smart contracts, and distributed ledgers. Researcher has expounded upon the clarification of non-fungible tokens (NFTs) by delving into their historical context, conceptual underpinnings, definitional parameters, significance, legal implications, and practical applications. Furthermore, the researcher has explicated the operational mechanism underlying NFT.

Chapter III – Legal Implications of NFTs on Intellectual Property Rights

The primary focus of the third chapter of this study pertains to the legal implications of NFTs, with particular emphasis on the ramifications of intellectual property rights law.

The researcher has undertaken a comprehensive analysis of the various legal aspects associated with NFTs. This chapter delves into the various forms of intellectual property rights (IPR). This section endeavors to achieve equilibrium between the entitlements of non-fungible token (NFT) holders and intellectual property rights (IPR) owners. It does so by scrutinizing the diverse issues and apprehensions that emerge from the intersection of NFT and IPR.

Chapter IV – Interplay of Non-Fungible Tokens and Intellectual Property Rights: Significant Case Studies

The fourth chapter of the study examines the interaction between NFTs and IPRs. This is achieved by analyzing ongoing legal disputes that have arisen globally in connection with NFTs and IPRs.

Chapter V – Legal Framework of Intellectual Property Rights In Relation To NFT

The fifth chapter of the research delves into the topic of digital rights management as it pertains to non-fungible tokens and intellectual property rights. The present chapter entails an analysis conducted by the researcher on diverse legal provisions sourced from multiple legislations, with the aim of ascertaining their coherence concerning the assignment of intellectual property rights. This part of the study is a crucial part that delves into the legal gaps and problems posed by nonfungible tokens in the field of Intellectual property rights. The uncertainty and inflexibility of current IP regimes are discussed and novel ways to tackle them are also examined. The emergence of a *sui generis* law and its implications are analyzed.

Chapter VI – Conclusion

Addressing the conclusion of the dissertation, the researcher has discussed the findings and suggestions. Researcher has conducted a comprehensive study of the current legislative framework and identified areas of deficiency. Additionally, the researcher has proposed recommendations that may prove advantageous to NFT creators, enabling them to maximize the value of their efforts while simultaneously contributing to the technological ecosystem. These suggestions aim to mitigate the legal ambiguities.

CHAPTER - 2

UNDERSTANDING BLOCKCHAIN TECHNOLOGY AND NON-FUNGIBLE TOKENS.

The utilization of blockchain technology has brought about significant transformations in diverse sectors, owing to its decentralized and transparent nature. One noteworthy domain where this technology has made a substantial impact is the realm of non-fungible tokens (NFTs). The utilization of blockchain technology has presented a significant and innovative application within the domain of non-fungible tokens (NFTs). Non-fungible tokens (NFTs) are distinct digital assets that serve as a representation of ownership or verification of authenticity for various items, including artwork, collectibles, and virtual real estate. The utilization of blockchain's decentralized ledger technology guarantees the security, immutability, and resistance to tampering of ownership records pertaining to non-fungible tokens (NFTs). Every non-fungible token (NFT) is allocated a distinct token identifier, which is securely stored on the blockchain, thereby offering a reliable means of verifying its authenticity and establishing ownership. This technological innovation facilitates the ability of artists, creators, and collectors to establish and safeguard the origin and authenticity of digital assets, thereby mitigating the potential for fraudulent activities and counterfeiting. The utilization of blockchain technology in non-fungible tokens (NFTs) additionally presents advantages such as fractional ownership and the ability to track royalties.[10] The utilization of blockchain technology enables the fragmentation of asset ownership into smaller units by NFT holders, thereby facilitating the emergence of investment prospects and the democratization of ownership. Moreover, smart contracts, which are agreements encoded into the blockchain and capable of self-execution, facilitate the automatic allocation of royalties to creators whenever their non-fungible token (NFT) is sold or exchanged in the secondary market. This particular characteristic guarantees that artists and content creators are able to sustain their advantages from the progressive appreciation of their work, even subsequent to the

[10] Javad Zarrin and others, 'Blockchain for decentralization of internet: prospects, trends, and challenges' (2021) 24 Cluster Computing 2841 <https://link.springer.com/article/10.1007/s10586-021-03301-8> accessed 1 May 2023.

primary transaction. The utilization of blockchain technology has facilitated the emergence of non-fungible tokens (NFTs), thereby introducing novel opportunities for artists, collectors, and investors within the digital economy. This has resulted in the establishment of a more robust ecosystem that promotes enhanced security, transparency, and inclusivity in the production and transaction of distinct digital assets.

2.1 Summary of 'blockchain technology'

Considering growing demand for progress in contemporary era, the field of technological advancement has been actively driving the accelerated evolution of various technologies. The blockchain technology is characterized by its decentralized nature, serving as a database that facilitates the secure exchange of information among disparate domains that lack mutual trust. The blockchain technology actively engages in the decision-making process through a cooperative, collaborative, and coordinated approach. The advent of blockchain technology has had a profound impact on the business landscape, revolutionizing various facets of the industry. Blockchain technology has the potential to introduce novel advancements in various sectors such as supply chain, healthcare, agriculture, banking, among others, through its ability to foster trust, enhance security, and ensure transparency.[11]

The initial comprehension of blockchain technology emerged in the 1990s. In the year 1990, a computer scientist, by the name of Leslie Lamport, made a submission of a academic paper by the name of "The Part Time Parliament" in a scholarly journal. This publication, however, did not occur until a span of 8 years later. This study presents a consensus model that facilitates the achievement of consensus among networks of computers that lack mutual trust. After the passage of a year, a digital ledger employed a cryptographic technique involving both public and private keys, alongside an electronic signature, to ensure the integrity of transactions and prevent any unauthorized modifications to the associated documents.[12] The integration of various technologies resulted in the development of a public distributed ledger technology that can be utilized

[11] BP Singh and Anand Kumar Tripathi, 'Technology and Intellectual Property Rights' [2019] JIPR 41.
[12] Peter Altmann, "Can Blockchain Technology Improve Trust?" ResearchGate March 2019) <https://www.researchgate.net/publication/332072308_How_Can_blockchain_technology_enhance_trust> accessed 1 June 2023.

in the regulation of digital currencies. This advancement was elucidated in a research publication titled 'Bitcoin: A Peer-to-Peer Electronic Cash System', which was authored by the pseudonym Satoshi Nakamoto. Subsequently, findings presented in this research paper were implemented to create a functional prototype of the cryptocurrency known as 'Bitcoin'.[13]

Blockchain technology is a decentralized form of ledger technology that operates on a peer-to-peer network. It utilizes a publicly accessible digital ledger that is both encrypted and unchangeable due to its utilization of asymmetric cryptographic keys. The sustainability and support of this federated ledger are facilitated by the general public through the operation of multiple nodes, eliminating the reliance on any centralized entity. The immutability of technology refers to the inability of any single participant to unilaterally alter data sent to the blockchain without detection. In order to modify data or transactions within the blockchain server, the consent of all current participants is required. This characteristic of the blockchain technology makes it highly advantageous for the storage of various forms of data, such as currency amounts, party identities, transaction magnitudes, and distinct codes.[14]

In order to comprehend the concept of blockchain, it is important to consider an illustrative example. Mr. X is required to transfer a certain sum of money to Mr. Y. Within the conventional framework, the initial step involves the submission of a request by party X to the bank in order to commence the transaction. The bank initially verifies the specified amount and credentials against the X account. Once the account has been verified and the correctness of the information has been confirmed, the designated amount will be transferred to Mr. Y. Several issues have emerged with the utilization of this conventional procedure, including the involvement of a centralised entity such as a

[13] Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' (Bitcoin 2008) <https://bitcoin.org/bitcoin.pdf> accessed 25 May 2023.
[14] Michael Crosby and others, 'Blockchain Technology Beyond Bitcoin' (Sutardja Center for Entrepreneurship & Technology Technical Report 16 October 2015) <https://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf> accessed 10 May 2023.

bank, the escalation of costs due to its non-affordability, and the inefficiency caused by time wastage.[15]

The emergence of blockchain technology has been instrumental in addressing these challenges through the utilization of a block-based framework. When the transaction is started through the Internet and contained in the block, it undergoes validation by network members, resulting in the successful transfer of the specified amount to Mr. Y without encountering any obstacles. Transactions that have been validated are immutable and cannot be modified in subsequent instances.[16]

The distinctive attributes of Blockchain Technology (BCT) have garnered interest from various communities seeking to explore and develop novel applications within decentralized and distributed networks. Innovative solutions are being proposed, whereby certain applications are transitioning from their conventional systems to blockchain technology.

The genesis of most novel technological advancements can typically be attributed to the imperative of addressing a specific problem. The issue may manifest as a novel challenge that emerges while executing a particular procedure, or as a preexisting problem that remains unresolved or only partially addressed due to the constraints imposed by current technologies.

Blockchain technology is a novel technological advancement that has emerged as a response to the longstanding issue of unpredictability in the realm of commerce. While complete elimination of uncertainty may not be possible, it is indeed feasible to reduce its magnitude. For a considerable duration, third-party institutions have fulfilled the crucial function of serving as arbitrators or legislators in agreements, thereby reducing uncertainty and bridging the trust gap that may exist between transacting parties. An exemplary illustration can be found in the context of an electronic commerce

[15] Dylan Yaga, Peter Mell, Nik Roby and Karen Scarfone, 'Blockchain Technology Overview' (National Institute of Standards and Technology Internal Report, 24 October, 2018) <https://www.researchgate.net/publication/334048606_Blockchain_Technology_Overview> accessed 25 May 2023.

[16] Arvind Narayanan and others, *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction* (1st ed. Princeton University Press 2016).

transaction.[17] The purchaser anticipates equitable goods and services that guarantee a commensurate value for their monetary investment. The seller anticipates receiving the agreed-upon payment upon fulfilling the obligation to deliver the specified goods or services in accordance with the terms of the agreement.[18] Evidently, a deficit in trust would exist between the parties with the intention of establishing a contractual agreement. Therefore, the emergence of a necessity for an intermediary becomes apparent, which in this scenario could be exemplified by entities such as e-Bay or Amazon, which offer a reliable platform for establishing trust between the involved parties. As previously mentioned, it is important to acknowledge that the presence of uncertainty or a lack of trust is not entirely eradicated, as the involvement of a mediating entity necessitates a certain level of trust. However, placing trust in an institution necessitates extensive research and a comprehensive understanding. The purpose of blockchain technology is to address the issue of uncertainty by establishing secure and decentralized applications, thus enhancing the level of assurance. The increasing acceptance and adoption of BCT in contemporary society can be attributed to its ability to operate effectively within a trustless environment.[19]

2.1.1 Characteristics of Blockchain Technology

The advent of the digital revolution has resulted in notable progress and alterations across multiple industries, with blockchain emerging as a technology that has garnered considerable interest. The emergence of blockchain technology has been regarded as a significant innovation that holds the potential to bring about revolutionary changes in various industries, including finance, supply chain management, healthcare, and others.[20] Fundamentally, blockchain is a decentralized system of record-keeping that facilitates the

[17] C. Komalavalli, Deepika Saxena and Chetna Laroiya, 'Overview of Blockchain Technology Concepts' in Saravanan Krishnan, Valentina Emilia Balas, Julie Golden, Y. Harold Robinson, S. Balaji and Raghvendra Kumar (eds), *Handbook of Research on Blockchain Technology* (Academic Press 2020).
[18] Gönenç Gürkaynak and others, 'Intellectual property law and practice in the blockchain realm' [34] 2018 CLSR <https://www.gurkaynak.av.tr/docs/8c65a-ip-law-and-practice-in-the-blockchain-realm.pdf> accessed 25 May 2023.
[19] Zarrin and others (n 10).
[20]Altmann Peter, '(How) can blockchain technology enhance trust?' (AOM Symposium, Boston, March 2019).

protected and transparent validation, documentation of digital transactions throughout network of computer nodes.[21]

Decentralization serves as the fundamental principle underpinning the concept of blockchain. In contrast to conventional centralized systems, wherein a central authority exercises control over and verifies transactions, blockchain functions in a decentralized fashion. This implies that the blockchain network is upheld and verified by numerous participants, commonly referred to as nodes. Every individual node possesses a complete replica of the entire blockchain, thereby guaranteeing redundancy and bolstering the system's ability to withstand the impact of singular points of failure.[22]

Immutability represents a pivotal attribute inherent in blockchain technology. Once a transaction is documented on the blockchain, it becomes exceedingly challenging to modify or manipulate. The accomplishment of this objective is facilitated by employing cryptographic methodologies, wherein every individual block within the chain incorporates an exclusive identifier referred to as a cryptographic hash. The cryptographic hash function is employed to transform the data of a block into a string of characters with a predetermined length, utilizing a mathematical algorithm. Any alteration made to the data within the block would lead to a distinct hash value, thereby notifying the network of possible unauthorized modifications. This particular characteristic guarantees the preservation of data integrity and the establishment of trust in the stored information within the blockchain.

The element of transparency holds significant importance within the realm of blockchain technology. The visibility of all transactions recorded on the blockchain extends to all participants within the network. The implementation of transparency in a system fosters a sense of trust among the individuals involved, eliminates the necessity for intermediaries, and facilitates the processes of auditing and ensuring accountability. The transaction

[21] Massimo Franceschet, 'Blockchain: a gentle introduction' <http://users.dimi.uniud.it/~massimo.franceschet/teaching/superiore/blockchain/presentation.html#1> accessed 25 March 2023.
[22] Simanta Shekhar Sarmah, 'Understanding Blockchain Technology' (Researchgate August 2018) <https://www.researchgate.net/publication/336130918_Understanding_Blockchain_Technology> accessed 13th May 2023.

history can be verified by any individual, allowing for independent confirmation of the blockchain's intended functionality.[23]

Consensus mechanisms are of utmost importance in the functioning of blockchain networks. The primary function of consensus mechanisms is to establish consensus among network participants regarding the legitimacy of transactions and the sequential arrangement in which they are incorporated into the blockchain. Various consensus mechanisms have been formulated; each possessing distinct advantages and compromises. Proof of Work (PoW), which was first introduced by Bitcoin, is widely recognized as the most prominent consensus mechanism. Within the Proof of Work (PoW) consensus mechanism, miners engage in a competitive process aimed at solving intricate mathematical puzzles. The primary objective of this process is to authenticate transactions and subsequently append blocks to the blockchain. The resolution of the puzzle necessitates a considerable amount of computational resources, thereby rendering the manipulation of the blockchain's historical records challenging. Proof of Stake (PoS) is a commonly employed consensus mechanism that selects validators to generate new blocks according to their stake or ownership of the cryptocurrency. Proof of Stake (PoS) is widely regarded as being more energy-efficient in comparison to Proof of Work (PoW).

2.1.2 Blockchain Architecture

The blockchain architecture comprises three primary components:

(a) Blocks

A block refers to a structural unit that serves as a container for a grouping of transactions. Every block is comprised of distinct identification, a timestamp, a reference to the preceding block, and a cryptographic hash of the block's data. Blockchain technology is a form of technology that functions by means of a sequence of interconnected blocks, thereby creating a structure resembling a chain, as suggested by its nomenclature.[24] The primary aspect of blockchain is referred to as a block. While a node starts a transaction by another node, a new block is appended to the server of the blockchain. Multiple blocks comprise the server of a blockchain. Furthermore, when analyzing the composition of a

[23] Dylan and others (n 15).
[24] *Ibid*.

block, it consists of two main components: a block body and a block header. The block body contains the detailed information of multiple transactions within its framework. The number of transactions that can be incorporated into a block is determined by the amount of the transactions produced by the node and the amount limit of the block. The block body consists of an internal list containing verified and valid transactions that is sent to the blockchain server. The structure of a body of the block can consist of a wide variety of data, depending on the specific attributes of the blockchain. A blockchain that incorporates Non-Fungible Tokens (NFTs) has the capacity to store extensive transactional data, encompassing the identities of the involved parties, specific details of the tokens, and a reference to the underlying asset.[25]

The block header is tasked with storing a set of data which contains relevant information about the block, whereas the body of the block is responsible for storing all the information related to the block. The metadata comprises multiple components, such as the Block version, the Hash of the preceding block, the Nonce, the Primary hash of the block, and the Time Stamp. A block version refers to a predetermined set of validation regulations that must be followed within a specific network. The term "timestamp" denotes the current date and time in which a transaction takes place. Value of nonce is 32-bit integer that is employed by various nodes in order to solve the challenge posed by the hash function.[26]

The Blockchain is a decentralized network consisting of interconnected blocks. Each block in the chain incorporates the hash value of the preceding block, resulting in a sequential and interconnected structure. The first block in a blockchain, often known as the Genesis block, lacks a hash digest of any preceding block because there are no prior blocks.[27] If a block recorded on the blockchain is modified, it will lead to the creation of a unique hash for that block. Consequently, the subsequent blocks would need to include the updated hash digest, as the hash digest of the previous block is contained in each

[25] Gaoying Cui, and others, 'Application of block chain in multi-level demand response reliable mechanism' (3rd International Conference on Information Management China April 2017).
[26] *Ibid*.
[27] *Ibid.*

block within its own structure. As a result, this would enable the detection and removal of the manipulated block.[28]

(b) Nodes

Nodes refer to individual computers or devices that actively engage in the blockchain network. These entities maintain a complete replica of the blockchain and perform verification of transactions. Nodes can be classified into various categories, including full nodes, which possess a comprehensive replica of the blockchain, and lightweight nodes, which depend on full nodes for the verification of transactions. One notable attribute of the blockchain network is its decentralized nature, wherein the absence of a centralized server results in the distribution of ownership of the blockchain among the general public. The blockchain can be described as a distributed ledger system that is interconnected through a network of multiple nodes, based on this underlying principle. Nodes are electronic devices that possess the capacity to store replicas of the chain and maintain server operations.[29]

In the blockchain network, every node maintains a replicated copy of the blockchain. In order to enhance the reliability of the blockchain, it is necessary for all nodes to provide their approval for the newly created block. The reliability of the network is enhanced through its decentralization, achieved by utilizing multiple nodes. This decentralization facilitates the smooth updating and approval of every transaction. Every individual node possesses the capability to access and observe the transactions that have been executed on their respective digital wallets.[30]

The process of disseminating these transactions and incorporating them into a validating system through the nodes improves credibility, reliability, and verifiability of the blockchain. From a foundational standpoint, blockchain technology can be seen as a mechanism for establishing trust and reliability.

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[28] Abhishek Sharma, 'Interrelationship between Non-Fungible Token and Intellectual Property Rights: A Study' (LL.M. Dissertation, National Law University and Judicial Academy, Assam 2022) <http://www.dlnluassam.ndl.iitkgp.ac.in/> accessed 4 May 2023.
[29] Zibin Zheng and others, 'An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends' (6th IEEE International Congress on Big Data June 2017).
[30] *Ibid*.

(c) Network

The network serves as the medium for connecting the various nodes within the blockchain system, enabling the seamless transmission of transactions and blocks throughout the entire network. The purpose of this mechanism is to guarantee that every node possesses uniform and current replicas of the blockchain.

2.1.3 Security Measures

Blockchain technology encompasses a multitude of security measures aimed at safeguarding the integrity and confidentiality of data.

a) *Cryptographic Hash Function*

The utilization of cryptographic hash functions, such as SHA-256, is employed by the blockchain technology to produce distinct hash values for every block. Any alteration made to the data contained within a block would lead to a distinct hash value, thus serving as an indication to the network of potential unauthorized modifications. Cryptographic hash functions play a vital role in the implementation of blockchain technology and can be utilized in myriad ways. Cryptography is an established technique used to protect sensitive information through the implementation of encryption and decryption processes, thereby ensuring the security of data. Hashing is a cryptographic technique that entails the utilization of a hash function to process an input, leading to the production of a distinct output referred to as a digest, which is exclusive to each input. The hash function under consideration is independent of both the size and the data.

The cryptographic hash function is a versatile tool that can be utilized across a range of data types, encompassing images, files, and text. The methodology facilitates the process of individuals inputting data and subsequently subjecting it to a hash function, which yields an identical output. This outcome serves as evidence of the data's integrity, as it indicates the absence of any unauthorized alterations. A slight modification in the input has the capacity to result in a substantial modification in the hash digest, such as reducing the size of the input by a single bit. The 32-bit integer, known as a nonce, can be used in

combination with the digest to produce unique hash outputs. Nonce is a cryptographic technique specifically designed for exclusive utilization in a singular instance.[31]

b) *Public-Key Cryptography*

The utilization of public-key cryptography is integral to the security measures implemented by blockchain technology, enabling the provision of secure digital signatures and encryption. Every individual involved in the network possesses a set of cryptographic keys, consisting of a public key utilized for verification purposes and a private key used for signing transactions.

c) Consensus mechanisms

These are of utmost importance in guaranteeing the security of the blockchain network. Consensus mechanisms serve the purpose of safeguarding the blockchain against tampering by malicious actors by necessitating agreement among network participants regarding the legitimacy of transactions.

d) *Decentralized Nature*

The security of blockchain is enhanced through its distributed nature, which eliminates the presence of singular points of failure. In the context of a distributed network, the alteration of a blockchain by an attacker necessitates the compromise of a substantial quantity of nodes, rendering such an endeavor exceedingly impracticable.[32]

2.1.4 Types of Blockchains

There exist primarily two distinct classifications of blockchains:

(a) *Public Blockchains*: Public Blockchains are accessible to all individuals and enable universal participation within the network. Permissionless systems are frequently characterized by the absence of restrictions on participant inclusion and transaction validation. Bitcoin and Ethereum represent instances of public blockchains.

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[31] Mohamed Barakat, Christian Eder and Timo Hanke, 'An Introduction to Cryptography' (Cryptography 20 September 2018) <https://www.mathematik.uni-kl.de/~ederc/download/Cryptography.pdf> accessed 24 May 2023.
[32]Peter (n 20).
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(b) *Private/Permissioned Blockchains*: Private Blockchains impose limitations on participation, confining it exclusively to a designated group of nodes. These systems are commonly employed in corporate environments, wherein the individuals involved are familiar and deemed reliable.[33] Permissioned blockchains provide increased levels of privacy and control, albeit at the expense of certain advantages associated with decentralization.

2.1.5 Smart Contracts and Decentralized Applications (DApps)

Although Smart Contracts may not be considered a foundational component of blockchain technology, their incorporation into the blockchain has the capacity to enable a multitude of innovative possibilities. Smart contracts are computer programs that serve as a means of documenting and enforcing agreements between multiple parties. In other words, the contractual clauses that have been mutually agreed upon by the people involved are put into the codes in order to facilitate the autonomous implementation of contracts.[34]

The notion of 'Smart Contract' was initially introduced in 1995 by Nick Szabo, a computer scientist, who defined ‘smart contracts’ as a computerized transaction code responsible for executing the stipulations of contract.[35] Primary goal of design of smart contract encompasses the fulfilment of customary contractual provisions, including those related to payment terms, liens, confidentiality, and enforcement. Simultaneously, smart contract design aims to minimize both intentional and unintentional deviations from the agreed terms and diminish the reliance on intermediaries who are trusted.[36]

Key aim of smart contracts is to facilitate the autonomous execution of contractual agreements. The software integrates the contractual requirements, encompassing the registration of intellectual property and property agreements, and guarantees the fulfilment of all stipulations and standards. Following this, the smart contracts can be triggered to carry out the specified contractual requirements, which may include the

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[33] Simanta (n 22).
[34] Franceschet (n 21).
[35] *Ibid.*
[36] Zibin Zheng,Shaoan Xie and others, ‘An Overview on Smart Contracts: Challenges, Advances and Platforms’ (Arxiv 22 December 2019) <https://arxiv.org/pdf/1912.10370.pdf> accessed 14 May 2023.

distribution of a proprietary right, sale of a property, or transfer of monetary funds. The utilization of smart contract technology allows the parties involved to autonomously enforce the contractual provisions in cases of non-compliance, without the need for intermediary entities like banks or insurance companies. Smart contracts offer distinct benefits in scenarios where there is a lack of mutual trust among the parties involved in fulfilling contractual obligations. Smart contracts play a crucial role in ensuring the enforcement of contractual provisions in such scenarios.

As a result, it is possible for both parties involved in a contract to utilize smart contracts to improve the stability and reliability of transactions on the blockchain network. A smart contract can be created through a consensus between parties involved in a contractual agreement, wherein the contractual terms are encoded and executed through validated transactions on the blockchain network. Once a clause within a contract is activated, the smart contract will initiate autonomous execution, which cannot be interrupted unless the contract's terms include provisions within those clauses to terminate the contract.[37]

In the realm of blockchain technology, smart contracts and decentralized applications (DApps) hold significant importance. Smart contracts are contracts that are capable of executing themselves, as the terms of the agreement are encoded directly into computer code.[38]

Smart contracts are contracts that are capable of executing themselves, as the terms of the agreement are encoded into computer code. These applications are implemented on blockchain platforms and are designed to execute automatically once predetermined conditions are satisfied. Smart contracts facilitate the development of decentralized applications (DApps), which are applications that operate on blockchain networks without the involvement of intermediaries.[39] Decentralized Applications (DApps) utilize the inherent characteristics of blockchain technology, such as decentralization, transparency, and immutability, to offer a range of services in a trustless manner.

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[37] Pratima Sharma and others, 'A review of smart contract-based platforms, applications, and challenges' (2021) 26(2) Cluster Computing < http://dx.doi.org/10.1007/s10586-021-03491-1> accessed 14 May 2023.
[38] Emmanuelle Ganne, *Can Blockchain Revolutionize International Trade?* (1st ed, WTO Publications, 2018.)
[39] Sharma and others (n 28).

In summary, blockchain technology represents a groundbreaking advancement that capitalizes on the principles of decentralization, immutability, transparency, and consensus to establish robust and transparent networks. The fundamental basis for the development of non-fungible tokens (NFTs) and various other applications is established by the architecture, consensus mechanisms, and security features of blockchain. A comprehensive grasp of these fundamental concepts is imperative in order to comprehend the potential ramifications and forthcoming advancements within the realm of blockchain technology.[40]

2.2 Concept of tokens

Within the realm of blockchain technology and cryptocurrency, tokens can be defined as digital assets that serve as representations of specific value or utility. Blockchain platforms, such as Ethereum, are commonly utilized for the creation and management of these entities. Tokens can fulfil diverse roles, encompassing functions such as acting as a form of digital currency, symbolizing ownership of an asset, or providing authorization to utilize a particular service or platform.[41]

Fungible tokens are characterized by their interchangeability and mutual substitutability. This implies that every individual unit of a fungible token possesses identical characteristics and holds equivalent value to any other unit. Divisibility is a characteristic possessed by these entities, enabling the utilization of fractions or smaller denominations in the context of financial transactions.[42] Fungible tokens encompass cryptocurrencies such as Bitcoin (BTC) and Ethereum (ETH). In the scenario where an individual possesses two Bitcoin tokens, it is observed that these tokens lack any discernible differences and can be readily interchanged on a one-to-one ratio, thereby ensuring the absence of any loss in their respective values.

Non-Fungible Tokens (NFTs): Non-fungible tokens (NFTs) are distinct and indivisible cryptographic tokens that serve as a representation of ownership or verification of the genuineness of a particular asset or piece of content. In contrast to fungible tokens, non-

[40] Gürkaynak (n 18).
[41] Yan Chen, 'Blockchain tokens and the potential democratization of entrepreneurship and innovation' (2018) 61(4) Business Horizons.
[42] *Ibid.*

fungible tokens (NFTs) possess unique attributes, properties, and intrinsic worth. Non-fungible tokens (NFTs) are frequently employed as a means of representing collectibles, digital artwork, in-game items, virtual real estate, and other similar assets. Every non-fungible token (NFT) possesses a distinct identification code that is securely stored on the blockchain, thereby guaranteeing its limited supply and individuality. The distinctiveness of non-fungible tokens (NFTs) precludes their direct exchange on a one-to-one basis, in contrast to fungible tokens. NFTs can be acquired, exchanged, and transacted on diverse platforms dedicated to the trading of such digital assets.[43]

An important characteristic of non-fungible tokens (NFTs) is their capacity to retain metadata, thereby offering supplementary details pertaining to the underlying asset they symbolize. The metadata associated with an NFT encompasses various elements such as information about the creator, the date of creation, descriptions, and other relevant details. This additional information serves to provide context and enhance the intrinsic worth of the NFT.

In brief, fungible tokens possess the characteristic of interchangeability and uniform value, whereas non-fungible tokens are distinguished by their uniqueness, indivisibility, and ability to signify ownership or provide evidence of authenticity for a particular asset. Both categories of tokens have garnered considerable attention and adoption within the blockchain.[44]

As previously discussed, every individual block within a blockchain possesses a exhaustive storage capacity.[45] When transactions within a specific block consume all available storage capacity, a subsequent block is created. The newly introduced block incorporates a cryptographic hash function of the preceding block and facilitates the inclusion of transactions that follow. By employing this methodology, all the previously mentioned blocks will be interconnected with the primary block, commonly known as the genesis block. The durability of the data stored in these blocks is ensured by the individual storage of each node.

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[43] Sharma and others (n 28).
[44] Mitchell Clark, 'NFTs, explained' (*The Verge* 18 August, 2021) <https://www.theverge.com/22310188/nft-explainer-what-is-blockchain-crypto-art-faq> accessed 12 May 2023.
[45] *Ibid*.

NFTs are essentially based on the underlying principles of blockchain technology. The validation of a transaction occurs with each occurrence of NFT creation and sale, subsequently initiating the execution of the associated smart contract. Process of validating a transaction indicates that all ownership details and metadata contained within the non-fungible token have been registered on the blockchain, ensuring the permanence of the data and the verification of ownership.[46]

The domain of non-fungible tokens (NFTs) encompasses a multitude of complex concepts, one of which pertains to the process of asset tokenization. Researchers must possess a thorough understanding of this concept, as it carries substantial importance for subsequent analyses. There are various approaches available for the creation of a piece of work. In order to convert a piece of art into a Non-Fungible Token (NFT), an individual has the option to either deploy an ERC721 standard contract on a digital device or employ pre-established tools specifically created for the purpose of minting NFTs. The representation of a file is achieved through the utilization of a non-fungible token (NFT). Following this, an individual has the capability to combine the non-fungible token with an advanced agreement in order to produce metadata, which is subsequently added to the blockchain infrastructure. The metadata utilizes the NFT token standard, a reliable and authenticated framework that allows external entities to utilize the standards as a reference point for verifying authenticity of any non-fungible token. The metadata linked to a digital artefact, in conjunction with collection of cryptographic keys and user accounts, transforms the token into a symbolic representation of the underlying work.[47]

The NFT under consideration is a synthetically generated digital asset that consists of a collection of programmatic instructions encompassing all pertinent data related to the NFT. The aforementioned data is subsequently added to the blockchain network. The ensuing non-fungible token (NFT) is a code segment that has been permanently recorded on the blockchain, containing various fragments of data. Non-fungible tokens (NFTs) encompass various constituents, encompassing both inherent and discretionary aspects.

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[46] *Ibid.*

[47] Kate Hertz, 'Know the Difference: On-Chain and Off-Chain NFTs' (30 September 2021) <https://www.one37pm.com/nft/tech/on-chain-and-off-chain-nfts> accessed 5 June 2023.

The Non-Fungible Token (NFT) is characterized by a crucial element known as the Token ID, a unique numerical value that is created at the moment of the non-fungible token's inception. The contract address holds significant importance within the context of a non-fungible token (NFT). The contract address functions as the designated location within the blockchain network. The combination of the two aforementioned components of the non-fungible token makes it unmatched and unique. The distinctiveness of a non-fungible token (NFT) is ascertained by the amalgamation of a particular Token ID and Contract address, thereby permitting the existence of solely one instance of said combination. The primary factors contributing to the distinctiveness of a non-fungible token (NFT) can be attributed to two key components.

A prevalent misconception surrounding non-fungible tokens (NFTs) is the belief that they serve as a digital manifestation of the underlying asset. It is important to acknowledge that the digital representation of the asset does not meet the criteria to be considered an essential element of the NFT, except for the hyperlink that is linked to the NFT and provides access to the aforementioned digital version. The image under consideration is not inherently connected to the non-fungible token (NFT) except for the existence of a uniform resource locator (URL) which directs to it. This specific component of NFT will be elaborated on in a subsequent section. Currently, it is crucial to understand that the digital representation of the asset played a fundamental role in the creation of the non-fungible token (NFT), thus establishing a unique relationship between the non-fungible token and the digital version of the asset. It is crucial to underscore that the non-fungible token (NFT) signifies the metadata recorded on the blockchain, rather than functioning as the digital representation of the underlying asset.

The current analysis highlights the fact that the act of minting NFTs entails using a digital representation of an asset to create a unique Token Id. This Token Id is then stored on the blockchain using a smart contract that conforms to the ERC-721 contract standard.[48] To facilitate the storage of an asset on the blockchain, it is imperative to employ a private digital signature that is exclusively owned by the entity responsible for creating the

[48] V Barda, 'ERC-721 NON-FUNGIBLE TOKEN STANDARD'
<https://ethereum.org/en/developers/docs/standards/tokens/erc-721/> accessed 14 May 2023.

asset.[49] The procedure for creating a token in accordance with the ERC-721 standard entails the utilization of a unique digital signature that is specific to the entity executing the token creation process. The combination of these elements contributes to the unique characteristics of a non-fungible token (NFT), ultimately leading to its inherent value of scarcity. The notion is underscored that a solitary foundational piece possesses the capacity to be transformed into numerous non-fungible tokens (NFTs).

When an individual purchases a non-fungible token (NFT), they exclusively obtain the metadata that is stored on the blockchain, rather than the digital representation of the underlying asset. The method of transferring metadata from the entity responsible for creating the digital asset to the individual or entity acquiring said asset is currently occurring. The process of obtaining an NFT involves acquiring its corresponding metadata file, which possesses the characteristic of being transferable. The complex characteristics of non-fungible tokens (NFTs) have resulted in a prevalent misconception among individuals who view them as mere replicas of digital assets. Nevertheless, it is important to note that this concept is not entirely precise, as non-fungible tokens (NFTs) operate as authenticated certificates that verify ownership of the underlying asset, rather than functioning solely as digital replicas of said asset.

There are various distinct classifications of non-fungible tokens (NFTs), with the most common type being the one that represents a digital copy of an asset through a metadata file. Off-chain works are a category of tasks in which the associated data is stored in a location external to the primary blockchain network. The subsequent category discussed is the NFT, which encompasses the integration of both metadata and the entirety of the asset onto the blockchain. These assets may be regarded as genuine assets that are native to the blockchain. This particular type of non-fungible token (NFT) is commonly known as an on-chain NFT. The previously mentioned classifications of non-fungible tokens are solely tradable on the blockchain network, and their ownership functions similarly to that of the underlying asset. However, this specific variant of non-fungible token (NFT) exhibits a relatively lower prevalence in comparison to its counterpart. The exorbitant financial burden associated with uploading an asset in its entirety can be attributed to the

[49] *Ibid.*

costs incurred by miners for mining the work and uploading it onto the blockchain. The fee under consideration is widely recognized as the gas fee in various marketplaces. The gas fee demonstrates a significant level of variability and experiences daily fluctuations. Currently, the cost of gas stands at approximately 15 US dollars per kilobyte.

Creators often choose to generate non-fungible tokens (NFTs) in the form of metadata files, primarily driven by the substantial gas fees associated with the process. This methodology effectively diminishes the dimensions of the non-fungible token (NFT) and facilitates the retention of the digital replica off-chain, either within the marketplace or on a blockchain-compatible online file storage system like IPFS.

2.2.1 Standards for Non-Fungible Token (NFT)

Smart contract standards encompass a variety of guidelines that pertain to different smart contract architectures. Standards pertain to the regulatory frameworks established within the application layer of blockchains, which serve to facilitate the implementation of smart contracts.[50] The standards mentioned above encompass a range of components, which include but are not limited to comprehensive terminology, standards for tokens, nomenclature for registries, and specifications for formatting.[51] Adherence to established standards is crucial for ensuring the effective execution of intended functions in smart contracts, including NFT minting, transaction regulation, and NFT sales. The utilization of smart contract standards serves a significant purpose, which is to establish regulatory frameworks that promote the smooth functioning of the blockchain network and facilitate efficient communication between various smart contracts. Within the realm of blockchain networks that facilitate the fulfillment of smart contracts, the incorporation of standardized protocols functions as a means for individuals to create and transact various tokens.[52]

[50] Monika Di Angelo, Gernot Salzer, 'Tokens, Types, and Standards: Identification and Utilization in Ethereum' (International Conference on Decentralized Applications and Infrastructures, Oxford 2020).
[51] Qin Wang, Rujia Li, Qi Wang & Shiping Chen 'Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges' (*Arxis* 25 October 2021) <https://arxiv.org/pdf/2105.07447.pdf> accessed 14 May 2023.
[52] Angelo and Salzer (n 50).

In essence, there are three main classifications of token standards, specifically ERC-721, ERC-20, and ERC-1155. The attributes of a specific token are predominantly influenced by the relevant token protocols.

Out of the three token standards, the ERC-20 token standard has garnered the highest level of adoption. The protocol sets a benchmark for fungible tokens that are deployed onto the Ethereum blockchain after meeting all necessary criteria. This suggests that the standard produces tokens that exhibit uniform characteristics and values. A multitude of decentralized finance (DeFi) applications create cryptocurrencies by leveraging well-established tokens like Bitcoin, Altcoin, Litecoin, and various others. Because of the implementation of such predetermined criteria, every individual cryptocurrency exhibits indistinguishable attributes and holds equivalent worth in relation to one another. In contrast, the ERC-721 token standard establishes a conventional framework for NFTs that encapsulate a unique digital asset, in distinction to fungible tokens. Non-fungible tokens (NFTs) possess unique attributes that differentiate them from other NFTs representing the same underlying asset. Every non-fungible token (NFT) consists of a unique combination of numerical values, specifically the Token Id and Contract address, which are specific to every individual non fungible token, as previously explained.[53]

The ERC-1155, also known as the Multi Token Standard, is classified as the third category of token standards. The token mentioned above demonstrates a hybrid nature, as it has the capacity to represent various quantities of both fungible and NFTs. In prior versions of the standards, it was necessary to have a separate contract for each token type, such as ERC-721 or ERC-20. This led to an excessive amount of data being stored on the blockchain. To provide an example, Thetan Arena, a single-player game, produces a wide range of tokens, thereby requiring the development of separate contracts for each individual token. ERC-1155 distinguishes itself from other token standards by utilizing the token ID feature to enable each ID to denote a separate token type. This facilitates the

[53] Wang and others (n 51).

inclusion of distinct metadata for each token type, thereby establishing its uniqueness with regards to preceding token types.[54]

2.2.2 The attributes of NFTs

Non-Fungible Tokens (NFTs) typically exhibit a diverse range of unique attributes that can manifest in various manners. Hence, undertaking a comprehensive enumeration of all these attributes would present a formidable challenge. Hence, the present discussion will exclusively concentrate on the essential inherent characteristics of NFTs, which are pivotal in comprehending the notion of NFTs. The following sections provide a detailed explanation of these features. The concept of uniqueness is exemplified by non-fungible tokens (NFTs), which enable individuals to create multiple tokens that symbolize a single asset, while preserving their distinctiveness. To provide an example, the Bored Ape Yacht Club has released a total of 10,000 unique tokens. The coding language utilized in non-fungible tokens (NFTs) incorporates embedded data that defines the characteristics of every asset in relation to its intended use. Non-fungible token (NFT) in the realm of digital art contains data that pertains to dimensions and pixel-associated characteristics of the digital artwork. In-game collectible token encompasses specific information regarding the value and functionality of the collectible within the game.[55]

Non-fungible tokens (NFTs) exhibit unique attributes with regards to ownership in connection to the underlying asset, encompassing fragmented ownership, reliable transaction tracking, and authenticated representation of ownership. Non-fungible tokens (NFTs) can manifest rarity through different mechanisms, including artificial scarcity, scarcity determined by quantity, or scarcity determined by time.[56]

The numerical scarcity of a non-fungible token (NFT) is determined by the number of NFTs that exist representing a specific asset and are currently in circulation. To provide an exemplification, a notable persona within the realm of sports may present a compilation of 50 non-fungible tokens (NFTs) showcasing diverse athletes belonging to a

[54] Nikos Kostopoulos and others, 'Demystifying Non-Fungible Tokens (NFTs)' (The European Union Blockchain Observatory & Forum) 2022.
[55] Kendrick Lau, 'Non-Fungible Tokens A Brief Introduction and History' (Crypto June 2021) <https://assets.ctfassets.net/hfgyig42jimx/6A8K5H6VrTydTDuEFHXQ5P/3cca896ad77bd967859a7a1256a5a91f/Crypto.com_Macro_Report_-_Non-Fungible_Tokens.pdf> accessed 14 May 2023.
[56] *Ibid*.

specific sporting discipline. The set of 50 digital cards mentioned earlier are obtainable within the game and are distinguished by the exclusive "digital signature" of various sports personalities. These cards are considered rarer compared to other collectibles in the game due to their limited quantity. The acquisition of a cricket bat bearing the autograph of one's favored sports player can be analogized to the possession of a standard cricket bat.[57]

Artificial rarity refers to the limited availability of a non-fungible token (NFT), which is achieved by utilizing a unique coding language that imparts a distinct characteristic to the asset. This concept exhibits a tangential relationship to numerical rarity. To gain a comprehensive understanding of the concepts of artificial rarity and numerical rarity, it is beneficial to examine a specific example. As an illustration, the NFT Cryptopunks, a collection consisting of 10,000 distinct digital characters, includes a limited subset of 175 punks that are embellished with surgical masks. In contrast, it was observed that around 2500 individuals were in possession of earrings that were categorized as punk. The prevalence of individuals wearing surgical masks is comparatively lower than those wearing earrings, despite the absence of a notable differentiation between the two cohorts.

Historical rarity pertains to the limited availability of an NFT due to its significant historical importance. Historical rarity can be manifested through a variety of means. The scarcity of ‘Cryptokitties’ non-fungible tokens (NFTs) can be ascribed to their position as one of the initial collectible NFTs to enter the marketplace, thereby endowing them with historical importance.[58] Moreover, considering that blockchains uphold an authenticated log of NFT ownership and individuals can be tracked via distributed ledger technology, the rarity of a non-fungible token may increase if it has previously been owned by a well-known celebrity or prominent individual. Just as in the realm of physical objects, a cricket bat that has been used by Virat Kohli in previous matches would be deemed to possess a higher degree of scarcity compared to any other bat.

[57] *Ibid* at 13.
[58] Angelo and Salzer (n 50).

The programmability attribute is what sets NFTs apart from traditional digital assets in the market. Like traditional digital assets, which integrate smart contracts into their structure; Non-fungible tokens (NFTs) possess the capacity to function as a symbolic representation of diverse tangible assets within the realm of the physical world. Moreover, non-fungible tokens (NFTs) possess the capacity to be programmed in a manner akin to any software application. An NFT possesses the capacity to be programmed in such a manner that enables the creator to maintain their resale rights and obtain royalties for any subsequent transactions involving the non-fungible token, along with the initial sale. Several non-fungible token creators opine that NFTs could be programmatically designed to enable their integration into decentralized finance applications, including but not limited to leasing, mortgages, and similar financial activities.[59]

The different classifications of tokens that employ blockchain technology possess a shared attribute of immutability, denoting that the tokens and their corresponding data are resistant to any form of alteration. Hence, it is not subject to unilateral modification by any individual user. Non-fungible tokens (NFTs) possess a notable level of genuineness and dependability, a characteristic that can be attributed to the aforementioned justification.[60]

2.2.3 Illustrative Application Scenario of Non-Fungible Tokens

Non-fungible tokens (NFTs) exhibit considerable efficacy in their capacity to symbolize a diverse array of real-world assets, encompassing both tangible and intangible manifestations. Due to this particular factor, there are numerous applications associated with non-fungible tokens (NFTs), a selection of which will be elucidated upon below in order to offer a comprehensive understanding of the potential utilities of NFTs.

2.2.3.1 The Significance of Gaming Collectibles

The utilization of non-fungible tokens (NFTs) in the realm of gaming collectibles shows significant potential. The unique characteristics of NFT-based gaming collectibles have

[59]Burcu Sakız, Ayşen Hiç 'Blockchain Beyond Cryptocurrency: Non-Fungible Tokens' (International Conference on Eurasian Economies, Baku 2021).
[60] Lau (n 55).

led to a significant disruption within the gaming industry. Virtual collectibles in games exhibit a fundamental resemblance to physical collectibles employed in board games like Monopoly, thereby offering a multitude of potentialities within the virtual domain. Digital collectibles offer several unique advantages compared to physical collectibles, thereby contributing significantly to their extensive popularity. In contrast to physical collectibles, digital collectibles do not experience degradation or deterioration as a result of the passage of time. Moreover, digital collectibles effectively address the logistical obstacles that arise from the necessity of physical co-presence of all involved parties.[61]

The multifaceted nature of NFT-based gaming collectibles holds significant importance for participants in the gaming community. Every participant is provided with digital objects that possess both common and unique attributes.[62] To ensure the distinctiveness of in-game items, unique codes are integrated into their corresponding tokens and subsequently distributed on the blockchain. Moreover, considering their inherent permanence, the act of dismantling these objects necessitates the explicit consent of the player.

The current market encompasses a variety of games that are based on non-fungible tokens (NFTs), like The Sandbox, Defi Kingdom, Cryptokitties, LiteBringer, Axie Infinity, and Treeverse, among others. In contemporary times, a derivative form of these interactive experiences has emerged within the realm of the gaming sector, commonly referred to as Play-to-Earn games. These games facilitate the acquisition of in-game assets and enhance their value through player participation in gameplay. The adoption of play-to-earn strategies is generating substantial upheaval within the gaming sector, as it presents players with a wide array of prospects. The meta-assets under consideration possess the ability to encompass a diverse array of items, spanning from virtual currency to valuable digital objects.[63]

[61] Vidal-Tomás, 'The new crypto niche: NFTs, play-to-earn, and metaverse tokens' (MPRA 2 January 2022) <https://mpra.ub.uni-muenchen.de/111351/1/MPRA_paper_111351.pdf> accessed 15 May 2023.
[62] *Ibid*.
[63] *Ibid.*

2.2.3.2 The Significance of Digital Art in Contemporary Society

The digital art market is a recognized sector that is currently witnessing widespread utilization of non-fungible tokens (NFTs). The viability and feasibility of the digital art industry can be attributed to its inherent instability and fragmentation into multiple components. The implementation of non-fungible tokens (NFTs) has resulted in a significant upheaval within the digital art industry. The unique attributes inherent in individual components of blockchain technology enable non-fungible tokens (NFTs) to augment the authenticity of digital art and potentially aid in the verification of ownership. The full realization of digital art's potential, in comparison to traditional art forms, has not been achieved due to its heightened vulnerability to replication and imitation. The advent of non-fungible tokens (NFTs) has enabled the provision of exclusiveness in ownership and immutability to digital art.[64] Traditional art forms are commonly recognized for the ability to produce identical copies, whereas Non-Fungible Tokens (NFTs) provide a method for generating distinct copies of a single digital artwork due to inclusion of unique metadata within the token. The unique metadata associated with the digital artwork enhances its rarity and consequently increases its value. Non-fungible tokens (NFTs) address the difficulties faced by artists regarding the replication of digital art by enabling the creation of unique instances of the artwork on the blockchain. The emergence of contemporary marketplaces has occurred in conjunction with traditional marketplaces, thereby facilitating the establishment of connections between digital artists and potential buyers. NFTs serve as a mechanism that enables digital artists to generate income and protect their intellectual property rights.[65]

2.2.3.3 Use case of NFTs in Musical royalties.

As video files and images can be encoded, audio files can also be encoded as non-fungible tokens (NFTs), enabling buyers to acquire a unique piece of music. Non-fungible tokens (NFTs) provide artists with the potential to receive ongoing royalties from future sales of their artwork and to engage in novel approaches to crowdfunding for production. Non-Fungible Tokens (NFTs) aid streaming applications by enabling the

[64] Lau (n 55).
[65] Wajiha Rehman and others, 'NFTs: Applications and Challenges' (22nd International Arab Conference on Information Technology (ACIT Conference, Muscat, December 2021).

tracking of an artist's work monetization, while simultaneously affording the artist the liberty to distribute their work without limitations.[66]

2.2.3.4 Use of NFTs in Supply Chain

Artists face several challenges arising from reproduction of their artwork, which necessitates the establishment of a mechanism to differentiate between the original piece and its duplicate. The replication of a product in the digital domain can present a substantial risk to the reputation of a brand, as the product acts as a manifestation of the brand's positive reputation. The artist places great significance on the positive reputation and perception of their product. The utilization of non-fungible tokens (NFTs) functions as a method to overcome this obstacle by serving as the authentication mechanism for the brand. Nike has recently filed a application of patent for a venture known as 'Cryptokicks', that is designed to be linked with each pair of shoes and functions as a means of validating the authenticity of the merchandise.[67]

One of the challenges faced by a brand in the implementation and organisation of its operations relates to the ownership of products. The phenomenon of globalisation has facilitated the amalgamation of nations into a cohesive global market, thereby fostering a heightened dependence on intermediaries.[68] As a result, the process of monitoring ownership has become laborious, requiring extensive documentation and the involvement of multiple entities. To tackle this issue, NFTs utilizes a digital representation of the product, such as cryptopunks, to verify the product's authenticity and streamline the ownership-tracking process.[69]

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[66] *Ibid*.
[67] Andrew Hayward, 'Why Larva Labs Sold the CryptoPunks NFT IP to the Bored Ape Creators' (*Decrypt* 14 March 2022) <https://decrypt.co/94973/why-larva-labs-sold-the-cryptopunks-nft-ip-to-the-bored-ape-creators> accessed 15 May 2023.
[68] Rehman and other (n 65).
[69] Tal Elyashiv, 'Non-Fungible Tokens for the Supply Chain' (SDC Executive 5 January 2022) <https://www.sdcexec.com/software-technology/ai-ar/article/21915598/spice-vc-nonfungible-tokens-for-the-supply-chain> accessed 15 May 2023.

CHAPTER - 3

LEGAL IMPLICATIONS OF NFTs ON INTELLECTUAL PROPERTY RIGHTS.

Non-Fungible Tokens have gained tremendous attention in recent years as a distinct and innovative form of digital asset ownership. NFTs represent ownership or proof of authenticity of a specific digital asset, such as artwork, music, videos, or virtual real estate, using blockchain technology. While NFTs offer exciting opportunities for creators and collectors, they also raise several legal issues and concerns, particularly in the realm of Intellectual Property Rights (IPR).[70] This essay aims to analyze the legal implications of NFTs, focusing on the intersection of NFTs and IPR.

One of the primary concerns with NFTs is the potential for copyright infringement and plagiarism. NFTs allow for the tokenization of digital content, which may include copyrighted material. Without proper authorization from the copyright holder, minting and selling NFTs of copyrighted works can infringe upon the exclusive rights of the original creator. This raises questions about the responsibility of NFT platforms and the liability of individuals involved in the creation and sale of infringing NFTs. Clear guidelines and mechanisms are needed to ensure that NFT transactions respect copyright laws and protect the rights of creators.[71]

NFTs provide a unique opportunity to establish ownership and authenticity of digital assets. However, challenges arise in verifying the originality and legitimacy of the underlying content. Instances of unauthorized minting and selling of NFTs based on existing digital works have been reported, leading to questions about the reliability of NFTs as proof of ownership and authenticity. Developing robust mechanisms to verify the originality of NFTs and ensuring transparency in the transaction process are crucial in

[70] Kendrick Lau, 'Non-Fungible Tokens A Brief Introduction and History' (Crypto June 2021) <https://assets.ctfassets.net/hfgyig42jimx/6A8K5H6VrTydTDuEFHXQ5P/3cca896ad77bd967859a7a1256a5a91f/Crypto.com_Macro_Report_-_Non-Fungible_Tokens.pdf> accessed 15 May 2023.

[71] Abhishek Sharma, 'Interrelationship between Non-Fungible Token and Intellectual Property Rights: A Study' (LL.M. Dissertation, National Law University and Judicial Academy, Assam 2022) <http://www.dlnluassam.ndl.iitkgp.ac.in/> accessed 4 May 2023.

addressing these concerns.[72] Blockchain technology can play a significant role in establishing an immutable record of ownership and provenance.

NFT transactions often involve the use of smart contracts, which are self-executing agreements recorded on the blockchain. Smart contracts govern the terms and conditions of NFT sales, including royalty arrangements and licensing agreements. However, complexities arise when disputes arise regarding the interpretation or enforcement of smart contracts. The legal enforceability of smart contracts and the potential for contractual ambiguities require careful consideration to protect the rights and interests of the parties involved. Clear and comprehensive contractual terms are necessary to mitigate potential legal disputes.

NFTs can involve the tokenization of personal identities, including celebrities and public figures. The commercialization of individuals' likeness without their consent raises concerns about the right of publicity and privacy. Unauthorized use of someone's image or persona for NFTs can lead to legal challenges, emphasizing the importance of obtaining proper permissions and releases from individuals whose identities are being tokenized. Striking a balance between the freedom of expression and the protection of individual rights is essential in this context.

The global nature of NFT transactions brings forth complex cross-border legal considerations. Intellectual property laws and regulations vary across jurisdictions, leading to challenges in enforcing rights and resolving disputes in international NFT transactions. Harmonization efforts and international collaborations are necessary to address these challenges and provide a consistent legal framework for NFTs. Cooperation between governments, industry stakeholders, and legal experts can facilitate the development of unified guidelines to ensure the smooth functioning of cross-border NFT transactions.[73]

As NFTs gain popularity, regulatory authorities are beginning to scrutinize the market to ensure compliance with existing laws and regulations. A lack of clear guidelines and

[72] Elli Kraizberg, 'Non-fungible tokens: a bubble or the end of an era of intellectual property rights' (2023) 9 Financ Innov <https://doi.org/10.1186/s40854-022-00428-4> accessed 16 May 2023.
[73] *Ibid.*

regulatory oversight raises concerns about consumer protection, anti-money laundering measures, taxation, and investor rights. Establishing appropriate regulatory frameworks and consumer safeguards are essential to maintain the integrity and trustworthiness of the NFT ecosystem. Collaboration between regulators, industry participants, and legal experts is necessary to strike a balance between innovation and consumer protection.

The emergence of NFTs has revolutionized the concept of ownership and provenance in the digital world. However, the legal implications surrounding NFTs, particularly in relation to Intellectual Property Rights, require careful analysis and consideration. Copyright infringement, proof of ownership, contractual issues, right of publicity, cross-border legal considerations, and regulatory compliance are complex issues that need to be addressed to ensure a sustainable and legally compliant NFT ecosystem. Striking the right balance between innovation, creativity, and legal compliance is key to realizing the full potential of NFTs while safeguarding the rights and interests of all stakeholders involved.[74]

3.1 Implication of Copyright of Non-Fungible Tokens

Discourse surrounding the utilization of non-fungible tokens may lead people disregard the concept of copyright. At its essence, non-fungible tokens (NFTs) primarily consist of metadata that is encoded within digital replicas of the artwork and subsequently recorded on the blockchain. Nevertheless, there exists uncertainty regarding whether

The question at hand pertains to the eligibility of copyright protection for this work, given that a significant portion of these works consist of trademark logos associated with a brand or are classified as public domain works. The concept of Non-Fungible Tokens (NFTs) allows for the representation of a wide range of assets, encompassing both tangible and intangible forms. This includes the ability to represent digital assets as well as physical assets. The work being represented is solely necessary in the initial stage to create the Token ID and Contract address of non-fungible token. The relationship between the underlying assets and the NFTs is characterized by a significant degree of looseness.

[74] Keyur Asarkar, 'Non-Fungible Tokens (NFTs) – An IPR Perspective' (2022) 4 (1) IJLSI 793 <https://doij.org/10.10000/IJLSI.111366> accessed 16 May 2023.

However, upon closer examination, there may be a potential legal concern surrounding NFTs from a copyright perspective. This is primarily attributed to several factors, including the fact that NFTs are predominantly associated with artwork and digital art. However, the main issue stems from the misconception regarding ownership of NFTs held by individuals.

In the process of transferring non-fungible tokens (NFTs), the purchaser of said tokens would solely obtain ownership of tokenized representation of the asset, which includes a hyperlink to corresponding digital copy of the work.

Non-Fungible Tokens (NFTs) can be analogized to cryptographic receipts that authenticate the ownership of an asset. Further clarification is required prior to engaging in the discourse. Firstly, it should be noted that the buyer of a non-fungible token (NFT) does not obtain proprietary rights to any additional copies of the underlying asset. Secondly, the buyer's proprietary rights are limited solely to the specific tokenized version of the work in question, without extending to any other aspects or forms of the asset. For an extended period, numerous creators have encountered significant challenges in generating revenue from their work due to the high vulnerability of digital artwork to unauthorized copying and distribution by individuals engaging in piracy.[75]

The presence of NFTs does not impact this particular aspect of digital copy, as copy pirates continue to duplicate and disseminate digital copies of the work that has been minted as non-fungible tokens, albeit with exception of certain copyright implications associated with it. NFTs serve as an alternative mechanism for representing the creator's entitlement to assert ownership over the underlying asset. One notable characteristic of this feature is its resistance to replication, distinguishing it from conventional digital copies of the work.[76] In this manner, the utilization of a solitary non-fungible token (NFT) for an asset can serve as a mechanism to align the ownership of digital works more

[75] *Ibid.*

[76] James Grimmelmann, Yan Ji and Tyler Kell, 'The tangled truth about NFTs and copyright' (*The Verge* June 8 2022) <https://www.theverge.com/23139793/nft-crypto-copyright-ownership-primer-cornell-ic3> accessed 16 May 2023.

closely with the ownership of physical assets, consequently leading to the creation of artificial scarcity.[77]

Based on the preceding discourse, a notable area of perplexity pertaining to non-fungible tokens (NFTs) revolves around the issue of copyright ownership in relation to the asset that is embodied by the NFT. For the purposes of this analysis, let us consider that the digital asset in question is eligible for protection under the copyright laws of India. The item in question can be classified as either an original digital file or a tangible object that is subsequently transformed into a digital format in order to be tokenized as a non-fungible token (NFT). This enquiry presents several concerns pertaining to ownership, specifically regarding the potential transfer of an artist's copyright of the artwork to the purchaser of a non-fungible token upon its sale. The question at hand pertains to whether the trading and minting of non-fungible tokens (NFTs) would be considered as a form of distribution under the provisions of Indian Copyright Act. When the responses to these enquiries are affirmative, it is worth considering whether the distribution of NFTs can be regarded as a form of reselling shares of original work and if the distribution of non-fungible tokens would be subject to first sale principle.

As previously elucidated, the possession of a non-fungible token (NFT) can be analogously likened to the possession of a collectable item, such as an anime card or a sports card. In a similar vein, non-fungible tokens (NFTs) can be likened to collectable cards as they function as tokens that symbolize specific underlying assets. When purchasing an NFT, there is no transfer of ownership of the underlying asset to the buyer. Similar to the purchase of a collectable card, the acquisition does not entail any transfer of ownership rights over the concerned sports player or anime monsters. Primary cause of these misunderstandings stems from the current market phenomenon wherein Non-Fungible Tokens (NFTs) are being traded for substantial sums of money globally. It is important to note that individuals who are willing to invest such significant amounts are not merely acquiring metadata, but rather something of substantial value.

[77] Phillips Ormonde Fitzpatrick, 'Dune, DAO and Copyright' (Lexology 1 March 2022) <https://www.lexology.com/library/detail.aspx?g=a81604bb-59a6-4ae4-802f-39e01e2a3bfe> accessed 16 May 2023.

In contemporary times, there exists a common misconception within the media wherein journalists erroneously report on transactions involving Non-Fungible Tokens (NFTs) by assuming that the artist has sold the original work, when, it is the NFT itself that is being sold. It is challenging to comprehend the rationale behind individuals' willingness to pay exorbitant prices for non-fungible tokens (NFTs), which essentially consist of digital code sequences recorded on a blockchain network and may lack discernible artistic significance.

Shifting our focus to the topic of copyright, there exists a prevalent belief among individuals that the acquisition of a non-fungible token would bestow copyright protection upon the purchaser of said non-fungible token. There is a prevailing misconception within the public. According to the prevailing principle, the individual responsible for producing the work is granted the copyright for said work. In the context of selling a non-fungible token (NFT), the transaction entails the transfer of the specific tokenized version of the work to the buyer, rather than the transfer of the copyright itself.[78] This concept can be understood through the utilization of an illustrative instance. Let us consider a scenario in which an individual purchases a book that contains the signature of a renowned writer. The act of affixing a signature to a book by the author has drawn parallels to the concept of non-fungible tokens (NFTs). In the current context, the person possesses the ownership rights to a specific book, like how the purchaser of a non-fungible token (NFT) is granted ownership of the non-fungible tokens. The author of the book, as the copyright owner, retains exclusive rights as the creator of the work. Consequently, the author is authorized to reproduce and distribute the books within the marketplace. It is important to acknowledge that the inclusion of the writer's autograph in this book would enhance its uniqueness and value by establishing an artificial scarcity.[79]

One significant matter that perturbs the originator of a creation is the potential eligibility for copyright protection of an NFT by the minter, as per the provisions of Copyright law. As per Section 13 of the Indian Copyright Act 1957, it is stated that works eligible for copyright protection include original literary, dramatic, musical, and artistic works, as

[78] Grimmelmann (n 76).
[79] *Ibid*.

well as cinematograph films and sound recordings. As previously elucidated, non-fungible tokens (NFTs) are digital assets that consist of metadata. These assets are appended to a blockchain and possess cryptographic signatures, thereby endowing them with distinctiveness in comparison to other duplicates. It can be inferred that the distinctive identification codes and metadata associated with the Non-Fungible Token (NFT) possess the potential for protection of copyright, as they are regarded as literary work according to section 2 (o)[80] of the relevant legislation. This provision encompasses literary works such as computer programmes, tables, and compilations, including computer databases. Additionally, section 2 (ffc)[81] defines computer programmes as a collection of instructions expressed in various forms, such as words, codes, schemes, or any other medium that can be read by a computer and capable of directing it to perform specific tasks or achieve particular outcomes.

The terms pertaining to the ownership of NFTs typically specify that individuals are granted limited personal noncommercial use and resale rights. It is important to note that there is no entitlement to license, commercially exploit, reproduce, distribute, create derivative works, publicly perform, or publicly display the non-fungible token, as well as the associated music or artwork. All copyright and other rights are retained and not conferred.

The scope of selling and ownership rights for buyers of non-fungible tokens is significantly restricted. Furthermore, the terms explicitly highlight the existence of distinct disparities between the rights associated with NFTs and those pertaining to the underlying asset. Hence, artists typically retain ownership of their resale royalties, commonly referred to as droit de suite. According to section 53A (1) of the Copyright Act, resale share rights are acknowledged. This provision states that if the original copy of a painting, sculpture, drawing, manuscript of a literary or dramatic work, or musical work is resold for a price that exceeds ten thousand rupees, the author of the work, or their legal heirs if they were the initial rights holder under section 17, shall have the right

[80] Sec. 2(o), The Copyright Act, 1957 (IN).
[81] Sec. 2(ffc), The Copyright Act, 1957 (IN).

to receive a portion of the resale price. This right is applicable regardless of any previous assignment of copyright and is subject to the provisions outlined in this section.[82]

The necessities outlined in this provision give rise to an additional noteworthy concern pertaining to the transaction of non-fungible tokens (NFTs). The droit de suite, also known as the resale share right, pertains to the transfer of rights of ownership in the initial artistic work or original script of a musical, dramatic, or literary composition. The resale share rights are exclusively applicable to the original copies of the work. As a result, artists are unable to exercise these rights in relation to non-fungible tokens (NFTs) due to the absence of copyright protection directly applied to NFTs, but rather to the underlying asset. Despite the presence of prerequisite objecthood and elements in the underlying asset, it is important to note that NFTs do not satisfy the requirements outlined in section 53A of the Copyright Act.

In the context of on-chain non-fungible tokens (NFTs), the process involves the inclusion of the original version of the artwork onto the blockchain. The act of transferring the non-fungible token (NFT) through a sale transaction can be classified as the sale of the original copy of the work. Consequently, this action would activate the provision regarding the resale share right. The creator of the original work would be entitled to royalties on the resale of the non-fungible tokens, provided that all conditions specified in the provision are satisfied. However, it is assumed that the individual who possesses the underlying asset and the non-fungible token is one and the same, and it is also acknowledged that there is no physical original copy of the artwork apart from the non-fungible token.

If the off-chain non-fungible tokens (NFTs) are unable to meet the criteria outlined in the resale share rights provision; a comparable framework can be implemented through the mutual agreement of the parties involved in the transaction. These rights can be incorporated into smart contract code, which is subsequently added to the blockchain by the creator themselves, an intermediary, or a marketplace in the form of a service.

[82] Sec. 53A (1), The Copyright Act, 1957 (IN).

3.1.1 Assignment

A copyright assignment pertains to the conveyance of the exclusive rights of the copyright owner to another individual or entity. The assignee is granted the authority to exercise the rights that have been assigned to them in a manner that is equivalent to that of the original copyright owner. In general, the sale of a non-fungible token (NFT) does not necessarily entail the transfer of rights. However, it is possible for certain instances to arise where the seller does indeed transfer a portion of their rights pertaining to the underlying asset to the buyer of the non-fungible token. In contemporary times, numerous NFT marketplaces have begun integrating functionalities that enable sellers to transfer copyright ownership of an object alongside the corresponding non-fungible token. For instance, when selling a non-fungible token on Mintable, the seller is presented with checkbox option to indicate their intention to transfer copyright. Subsequently, Mintable incorporates this transfer into the associated smart contract that accompanies the NFT.

Several implications arise from the assignment of copyright in Non-Fungible Tokens (NFTs). These implications can be summarized as follows: 1. Ownership and Control: In the context of NFTs, the assignment of copyright entails the voluntary transfer of the original copyright owner's exclusive rights to the assignee. The individual or entity to whom the assignment is granted acquires authority over the copyrighted material, encompassing the privileges to duplicate, exhibit, trade, or authorize the utilization of said work. The transfer of ownership can have substantial implications for all parties involved. [83]

The allocation of royalties and revenue derived from the exploitation of a work can be influenced by the copyright assignment within Non-Fungible Tokens (NFTs). In the customary practice, creators are entitled to a portion of the proceeds generated from the sale or licensing of their copyrighted material. Once copyright is transferred, the recipient becomes eligible to receive the associated royalties and revenue, unless otherwise stipulated in the assignment agreement. In specific legal jurisdictions, creators maintain moral rights over their works, even in cases where they transfer the copyright ownership. Moral rights encompass the entitlement to be acknowledged as the originator of a work

[83] Abhishek and others (n.71)

and the entitlement to the preservation of the work's integrity. The moral rights associated with the work may impose limitations on the assignee's ability to modify or utilize the work within the realm of NFTs, thereby safeguarding the creator's reputation and artistic integrity.

The present inquiry pertains to the validity of a minimalist consent from the seller as a means of effectuating the transfer of rights. According to Article 5(2) of the Berne Convention, the rights associated with intellectual property should not be contingent upon any procedural requirements. As the Berne Convention does not impose any formalities for the transfer of these rights, their validity is determined by the specific laws of individual nations. This is further complicated by the lack of consistency in legislation across different jurisdictions.

In accordance with Indian legislation, Section 19(1) of the Indian Copyright Act stipulates that “the transfer of copyright in any work shall only be deemed valid if it is documented in writing and bears the signature of the assignor or their duly authorized representative”. In its most encompassing interpretation, the assignment of copyright entails the conveyance of ownership. Nevertheless, the copyright holder possesses the ability to delegate exclusive privileges. Consequently, the necessity for a written assignment becomes increasingly crucial in order to unambiguously delineate the specifics of said assignment.[84]

Now, an inquiry arises regarding the definition of "in writing" and "signed" within the context of this provision. Adequate legal precedent has been established within the framework of Indian law with regards to this facet. It has been established that electronic files have the capacity to serve as a means for the execution of contracts. Moreover, the stipulation of being "in writing" and "signed" in copyright law bears resemblance to the corresponding requirement in contract law. Hence, the determination of an assignment's validity can be clearly ascertained through the application of pertinent case laws. In a similar vein, in instances where Indian legislation mandates the presence of a written document, this obligation can be satisfied through the utilization of technology. Moreover, the scope of this requirement can be construed expansively to encompass

[84] *Ibid.*

diverse technological means of presenting data which is in written form, such as printing, photography, lithography, typing, and so forth. According to Section 4 of the Information Technology Act, 2000, if any law stipulates that information or any other content must be in written, typewritten, or printed form, then, regardless of the provisions of that law, the requirement will be considered fulfilled if the information or content is presented or made accessible in an electronic format that can be utilized for future reference. Various judicial bodies have construed diverse mediums, including WhatsApp messages and electronic mails, as meeting the criteria of written format. In the context of assignments, it is possible for an assignment to be considered valid even though the consent given is minimal and given in electronic format. This validity is contingent upon the document clearly and unambiguously identifying the specific work that is being assigned. Nevertheless, the process of identifying the artwork within Non-Fungible Tokens (NFTs) can present difficulties, primarily due to the utilization of computer codes in certain NFT transactions.[85]

Regarding the stipulation of being "signed," it is worth noting that current legislation already acknowledges the legitimacy of electronic signatures in the context of legal records. The legislation governing the utilization of electronic signatures in legal documents in India is the Information Technology Act of 2000. According to Section 5 of the Information Technology Act, 2000, if any law stipulates that information or any other content must be verified by a signature, or if any document must be signed or bear the signature of an individual, then, regardless of the provisions of that particular law, this requirement will be considered fulfilled if the information or content is authenticated using an electronic signature affixed in the manner prescribed by the Central Government. The definition of an electronic signature is expanded upon in the act, which states that it is the process by which a subscriber authenticates an electronic record using the electronic method outlined in the Second Schedule of the IT Act. This definition also encompasses the concept of a digital signature. As a consequence of this legislation, courts currently acknowledge diverse forms of signatures as legally acceptable electronic signatures.

[85] *Ibid.*

While the current legal framework typically incorporates provisions for electronic signatures, there remains ambiguity in certain jurisdictions regarding the classification of a cryptographic signature utilized for signing a NFT as an electronic signature. As elucidated in preceding sections, during the process of minting a non-fungible token (NFT), the individual responsible for minting, commonly referred as the minter, has the capability to incorporate their distinctive cryptographic key, which is exclusively accessible to them. The cryptographic signature mentioned in the IT Act is commonly known as a digital signature. The encompassing definition of an electronic signature, which encompasses digital signatures, implies that the cryptographic signature employed during the creation of an NFT would be deemed legally valid in accordance with Indian legislation. Furthermore, it should be noted that the Law Commission of England and Wales has expanded the definition of a signature to encompass not only traditional physical signatures, but also a range of electronic records.[86]

In order to assess the legitimacy of utilizing a tick box as a means of establishing a copyright assignment, it is possible to draw parallels with click-wrap agreements, which involve the provision of consent through the act of clicking a button. Click-wrap agreements, which involve the utilization of a "I Agree" click button to establish a contractual relationship, have garnered significant attention within the realm of case law. The manifestation of consent in a contractual agreement can be inferred from various actions undertaken by one of the parties, such as ticking a box, signing electronically, or completing a form. These actions collectively signify the party's commitment to the contractual obligations, thus constituting an assignment to the contract.

Upon thorough examination of the aforementioned components, there may persist certain uncertainties regarding the potential fulfilment of the written requirement by a token registered on a blockchain network during the process of minting a non-fungible token (NFT). The issue of smart contract validity has sparked debates from proponents and critics alike. However, an increasingly favorable perspective is emerging regarding the efficacy of smart contracts in facilitating the transfer of rights. Furthermore, in order to guarantee the effective transfer of rights, certain individuals are presently opting to utilize

[86] *Ibid.*

tangible documents and handwritten signatures as a means of enhancing confidence and certainty.

3.2 Trademark implications upon non-fungible tokens

Foremost and principal consideration for brands and companies when selling their non-fungible tokens (NFTs) is to ensure that their listing in the marketplace is distinctive, thus leading them to integrate their trademark within the NFT. However, a significant number of unauthorized instances of producing and trading non-fungible tokens (NFTs) occur, wherein well-known brand trademarks are utilized without obtaining proper authorization, thus resulting in trademark infringement. In the realm of fashion, companies such as Louis Vuitton and Tiffany are integrating their brand's distinctive symbol into their non-fungible tokens to enable their clientele to verify the genuineness of these digital assets. The integration of trademarks into non-fungible tokens (NFTs) presents several intriguing enquiries, including whether the registration of a trademark for safeguarding a particular category of product or service would inherently encompass the utilization of a trademark as an NFT. Additionally, it is worth considering whether non-fungible tokens (NFTs) could potentially serve as an alternative authentication system for the assets associated with the brand.[87] Furthermore, it is important to consider the implications for brand rights when an individual produces an unauthorized non-fungible token (NFT) that incorporates a trademarked brand. Additionally, is it permissible for the proprietor of a legally registered trademark to create a non-fungible token (NFT) that derives from the aforementioned registered trademark? The resolution of these complex issues could be achieved through the expansion of trademark registration by brands, encompassing NFTs that incorporate the trademarks of said brands.

As the NFT boom continues, it is advisable for brands and creators to incorporate these unique virtual tokens into their intellectual property (IP) protection strategies, considering the increasing assertiveness with which they are being developed. The emerging trend

[87] Gudrun Irsa-Klingspiegl ‘NFTs and branding – Does trademark protection need to be considered?’ (ICLG 22 July 2021) <https://iclg.com/briefing/16813-nfts-and-branding-does-trademark-protection-need-to-be-considered -austria> accessed 16 May 2023.

suggests that non-fungible tokens (NFTs) are increasingly being recognized as a select group of indicators that can serve as identifiers for traders.[88]

One of the primary sources of uncertainty regarding ownership of non-fungible tokens (NFTs) pertains to the verification of identity, as it relies on the blockchain, a currently unregulated technology. The blockchain possesses the inherent benefits of being an open-source distributed ledger, thereby enabling the traceability of ownership and transfers. When confronted with assets of significant value, it is advisable for traders to contemplate expanding their trade mark portfolios to encompass these assets.

According to Section 2 (zb) of the Trademark Act, 1999[89], a "trademark" is defined as a graphical representation that can differentiate the goods or services of one individual from the goods or services of others. This representation may encompass the shape of goods, their packaging, and combinations of colors. This implies that trademarks are marks that possess the ability to differentiate between goods and services. According to section 2(j), goods are defined as "anything that is the object of trade or manufacture." Hence, it can be inferred that non-fungible tokens possess the potential to be eligible for trademark protection due to their ability to be traded across multiple online marketplaces and their creation through blockchain technology.[90]

Therefore, it can be asserted that trademark protection unequivocally applies to a non-fungible token (NFT). The act of registering a trademark for classification that includes non-fungible tokens (NFTs) would provide brand owners with the ability to safeguard against the unauthorized creation of NFTs featuring their trademark. Implementing this measure would provide an additional layer of protection, effectively preventing any individual from utilizing a mark that is either identical or bears resemblance to the mark employed by the brands within the context of a NFT.

The act of obtaining a trademark for a NFT serves the purpose of safeguarding against the unauthorized usage of an identical or resembling name or logo by other NFT creators. The act of obtaining a trademark for a non-fungible token (NFT) serves the purpose of

[88] *Ibid.*
[89] Sec. 2(zb), The Trademark Act, 1999 (IN).
[90] Sec. 2(j), The Trademark Act, 1999 (IN).

safeguarding the exclusive usage of one's name or logo, thereby preserving their distinctiveness and preventing unauthorized utilization by others. Trademark protection is an essential requirement for brand owners seeking to safeguard their non-fungible tokens (NFTs). This is the way trademarks are applicable to non-fungible tokens (NFTs).

The enquiry arises as to whether trademark protection is applicable to non-fungible tokens (NFTs). In this regard, it is pertinent to determine the specific trademark classes under which NFT artworks may be categorized.

According to section 7 (1) of the Trademark Act, 1999, it is required that the Registrar categorises goods and services in alignment with international classification of goods and services (NICE) Classification for the purpose of registering trademarks.[91]

In instances where specific goods or services were not listed in alphabetical index of goods and services provided in this sub-section, determination of the classification of goods or services shall be made by Registrar.

The NICE Classification has previously approved terminology for online marketplaces like Opensea, which facilitate the sale of NFTs and serve as intermediaries between NFT creators and buyers. Given the longstanding presence of online marketplaces catering to various goods and services, it was anticipated that a preexisting category would be allocated within alphabetical list of the Nice Classification under class 35, specifically denoting the "provision of an online marketplace for buyers and sellers of goods and services." Although the Non-fungible token marketplace operates on blockchain. Hence, one may posit that the protection of a trademark for a non-fungible token (NFT) marketplace could potentially fall within the framework of the NICE Classification system.

The present enquiry pertains to the possibility of locating the virtual goods or services associated with non-fungible tokens (NFTs) within the comprehensive alphabetical index of the NICE Classification.

Trademark protection is typically afforded to works of art. It can be inferred from the existence of previously approved terminology of artworks of different materials, like

[91] Sec.7(1), The Trademark Act, 1999 (IN).

metal works of art in Class 6 and works of art made of card in Class 16 of the International Classification of Goods and Services (NICE Classification system).[92] Likewise, trademark protection may be extended to encompass digital art. If NFTs are perceived as analogous to digital artworks, it is probable that they would be categorized within Class 9, specifically under the classification of recorded content. This perspective presents a limited understanding of the categorization of NFTs, as their classification can vary based on the unique characteristics and modes of representation associated with each individual NFT.

Moreover, it is possible to grant trademark protection to the artwork itself. The process of tokenizing the art does not complicate matters, as the specific services or goods for which art is utilized by the brand in a trademark are irrelevant. In an alternative scenario, the tokenized rendition of artwork is employed as distinctive symbol by the brand across a range of goods and services. Consequently, in this particular instance, the brands are required to obtain trademark protection for the designated goods and services.

Therefore, it can be inferred that there is no standardised approach for obtaining trademark protection for virtual goods and services related to NFT arts and marketplaces.

In the realm of trademark law, infringement occurs when an individual, lacking authorisation from the brand owner, attempts to create a non-fungible token (NFT) using an asset and employs the brand's mark in the process of commercial activity, such as advertising, offering for sale, or actual sale of the non-Fungible token that incorporates the brand trademark.

Primary aspect to be examined is whether the proprietor of the brands has obtained trademark registration for non-fungible tokens or comparable goods or services. If the brand possesses trademark registration for these goods and services, then the act of incorporating that mark into a non-fungible token without authorization would unequivocally constitute trademark infringement.

[92] International Classification of Goods and Services (Nice Classification WIPO) <https://www.wipo.int/classifications/nice/en/> accessed 16 May 2023.

According to Section 29(1) of the Trademark Act, 1999, the utilization of an identical or deceptively similar mark in connection with identical goods or services for which the trademark is registered would be considered an infringement by the owner of the intellectual property.[93]

Section 29 (2) of the Trademark Act, 1999 stipulates infringement of a registered trademark occurs under the following circumstances: (a) when the new mark is identical to the registered trademark and the goods or services are similar to those covered by the registered trademark; or (b) when the new mark is similar to the registered trademark and the goods or services are identical or similar to those covered by the registered trademark; or (c) when the new mark is identical to the registered trademark and the goods or services are identical to those covered by the registered trademark, resulting in a likelihood of confusion among the public.

However, it should be noted that the absence of a registered trademark for non-fungible tokens or related goods and services by the brand owner does not necessarily mean that there is no possibility of trademark infringement. In certain situations, it is possible that the use of a similar or identical mark for different goods may still constitute infringement.[94]

According to section 29 (4) of the Trademark Act, the use of a new mark that is identical or similar to a registered trademark, but is applied to goods or services that are dissimilar to those for which the trademark is registered, would constitute an infringement. Additionally, if the registered trademark has a reputation in India and the use of the new mark without justifiable reason exploits or harms the distinctive nature or reputation of the registered trademark, it would also be considered an infringement.[95] The unauthorised use of trademarks by creators without permission is a significant issue that greatly concerns artists and authors of the original assets. This concern has become more prevalent due to the increasing number of cases where non-fungible tokens (NFTs)

[93] Sec.29(1), The Trademark Act, 1999 (IN).
[94] Sec.29(2), The Trademark Act, 1999 (IN).
[95] Sec.29(4), The Trademark Act, 1999 (IN).

incorporating trademarks from well-known brands are being listed for sale on various NFT marketplaces.

Consequently, numerous lawsuits have been initiated by prominent brands against sellers of non-fungible tokens (NFTs) on grounds of trademark infringement. Miramax, the entertainment studio, has initiated legal proceedings by filing a lawsuit alleging copyright and trademark infringement against esteemed director Quentin Tarantino. The legal action stems from Tarantino's public announcement regarding an upcoming auction wherein he intends to sell 12 non-fungible tokens (NFTs) inspired by the highly regarded film Pulp Fiction. Hermès, the esteemed luxury design house, has initiated a legal proceeding against Mason Rothschild, who has introduced a series of 100 non-fungible tokens under the brand name 'MetaBirkins'. These NFTs portray Birkin bags and have been sold for substantial sums, reaching tens of thousands of dollars.

Presently, although instances of trademark infringement suits involving non-fungible tokens are relatively limited, it is apparent that creators of NFTs on the NFT marketplace are exploiting well-known brands. This is evident from the presence of numerous unknown accounts that have listed non-fungible tokens incorporating the logos and trademarks of well-known brands. Hence, it is imperative to assign a certain degree of responsibility to the NFT marketplace in order to effectively govern the transaction of NFTs and establish regulations pertaining to sellers who offer NFTs featuring prominent brand names and logos. This measure would consequently mitigate instances of trademark infringement.[96]

As previously mentioned, the utilisation of NFTs gives rise to a range of issues and concerns, particularly in relation to trademark matters. One notable concern pertains to the appropriation of trademarks during the branding of NFTs and the subsequent impact on the rights of trademark owners.

[96] Tim Lince ‘OpenSea: how trademark infringement is rampant on the biggest NFT marketplace’ (*World Trademark Review* 20 January 2022) accessed 16 May 2023.

In the legal matter of Hermes International et al v. Rothschild[97], it was contended by Hermes that Rothschild had unlawfully utilised Hermes's trademark associated with its well-known brand 'Birkin' by labelling his non-fungible token as 'MetaBirkin', thereby violating Hermes' trademark rights.[98]

The concept of appropriation art, with regards to trademark rights, entails the act of borrowing or replicating a widely recognised or popular trademark and integrating it into a novel artwork. One of the most renowned artists in terms of appropriating trademark rights is Andy Warhol, who is widely recognised for his notable artwork that incorporates Campbell soup cans. The artwork created by Andy Warhol represents a highly significant example of appropriation art within the realm of trademark rights.

As previously examined, appropriation art gives rise to a multitude of copyright concerns, consequently resulting in numerous instances of litigation pertaining to copyright infringement. In contemporary times, courts tend to refrain from categorising every instance of appropriation art as a violation of copyright, as evidenced by the legal proceedings of Blanch v. Koons[99] and Prince v. Cariou[100]. In contrast, legal authorities have determined that Andy Warhol's renowned Prince series constitutes copyright infringement due to its failure to satisfy the criteria for transformative work, thereby precluding its classification as an exception under the fair use defence. In cases of copyright infringement involving art appropriation, the courts have employed the fair use test to determine the extent to which a work is sufficiently transformative to be classified as appropriation art. Nonetheless, several artists engaged in appropriation have previously presented arguments to the courts, contending that the application of the fair use test to appropriation art may impede the artist's ability to integrate preexisting works into a novel artwork, consequently impeding the creative growth and advancement of the art community.[101]

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[97] Hermes International et al. v. Rothschild, U.S. District Court Southern District of New York, Case No. 1:22-cv-00384-JSR, ECF No. 1.
[98] *Ibid*.
[99] Blanch v. Koons, 467 F.3d 244 (2006)
[100] Cariou v. Prince, 714 F.3d 694 (2d Cir. 2013)
[101] Klingspiegl (n 87).

Furthermore, the authors contended that the lack of a clear definition for the fair use test poses a threat to artistic creations that involve the transformation of pre-existing works. In instances involving trademark infringement related to art appropriation, the relevance of the fair use test is diminished, as exemplified by the Dallas Cowboys Cheerleaders, Inc. v. Pussycat Cinema, Ltd. case[102], wherein the court did not employ the fair use test to address the issue of trademark infringement through appropriation art.

When an appropriation artist incorporates a trademark into their artwork, it raises concerns regarding the protection of freedom of expression as guaranteed by the First Amendment. Consequently, a more appropriate evaluation for determining the permissibility of trademark appropriation in art is the balancing test, also known as the Roger test. This test was established by the United States Court of Appeals for the Second Circuit in the legal case Rogers v. Grimaldi[103]. The case involved a complaint filed by renowned artist Ginger Rogers against Alberto Grimaldi, the producer and distributor of the film titled 'Ginger and Fred'. Roger has made the claim that this film has infringed upon his trademark rights as outlined in the Lanham Act, as well as his right to publicity. The court observed that the present dispute entails a clash between the entitlement of Rogers to publicity and the freedom of expression of Grimaldi in his own artistic creation.

3.3 Implications of Non-fungible tokens on Personality rights

Personality rights encompass a subset of intellectual property rights that aim to protect legal entitlements of individuals who possess a recognized reputation or prominent public persona. These rights serve as a safeguard against individuals or entities who seek to exploit the distinctive attributes of these individuals for financial gain. Given the esteemed status of these individuals, their reputation becomes a valuable asset that can be leveraged for commercial purposes by certain individuals. The prevailing stance on the protection of personality rights in various legal systems can be broadly categorised into two approaches. Firstly, there is the recognition of personality rights as an inherent right, as exemplified in the legal system of the United States. Secondly, there is the

[102] *Dallas Cowboys Cheerleaders v. Pussycat Cinema, Ltd.*, 467 F. Supp. 366 (S.D.N.Y. 1979)
[103] *Rogers v. Grimaldi*, 695 F. Supp. 112 (S.D.N.Y. 1988)

safeguarding of these rights through the common law remedy of passing off, which is observed in countries such as the United Kingdom and India.[104]

NFTs depicting well-known individuals are more sought after than those lacking such depictions, both in terms of marketing and financial value. It is evident that numerous professional athletes have entered the market to auction non-fungible tokens (NFTs) that represent their likeness.

There exists a viewpoint positing that non-fungible tokens (NFTs) serve as a means for celebrities to reclaim their rights over their personal identities. The aforementioned individuals offer a novel marketing prospect for athletes and celebrities to generate financial gains through the utilisation of their name, image, or likeness. This phenomenon has enabled athletes to establish themselves as independent marketing entities and negotiate for the acquisition of these rights in a manner that lies beyond the purview of collective bargaining agreements.

In accordance with the aforementioned, numerous athletes have engaged in the sale of their personal trading cards and digital collectibles independent of league and team affiliations, thereby enabling them to assert their rights to personal identity. For example, a unique digital trading card featuring the renowned soccer player Cristiano Ronaldo was purchased for a price slightly below $290,000.

The rising popularity of NFTs may lead to celebrities leveraging their own identities and images as digital assets. Consequently, any potential violations of these rights will be thoroughly examined and rigorously enforced.

The infringement of personality rights occurs when an individual's image, name, or reputation is incorporated in any form without authorization by a person who lists NFTs for sale. In the present circumstance, the intermediary participating in the transaction will also contribute to the infringement of the celebrity's right to personality. Moreover, the person who purchases those non-fungible tokens (NFTs) bears responsibility when they subsequently resell these NFTs or utilize the underlying artwork to advance their

[104] Niki Shadoan ‘NFTs and Personality Rights’ (One37PM 15 December 2021) <https://www.one37pm.com/nft/nfts-and-personality-rights> accessed 16 May 2023.

financial pursuits. For instance, when an organization employs non-fungible tokens (NFTs) as a means to attract consumers and generate website traffic. The legal responsibility of marketplaces is contingent upon the specific legislation of the respective state. Typically, individuals would be regarded as secondary infringers unless they demonstrate thorough diligence in preventing the infringement of celebrity rights. In this manner, the enforcement of personality rights can be achieved during the processes of purchasing, selling, or hosting non-fungible tokens (NFTs), which may involve the incorporation of another individual's rights.[105]

One notable instance pertaining to the issue of publicity rights is the legal dispute between Michael Jordan and Jewel Food Stores. In this case[106], Michael Jordan initiated a lawsuit against Jewel Food Stores on the grounds of infringing upon his publicity rights. The violation occurred when Jewel Food Stores extended congratulations to Michael Jordan for his induction into the Hall of Fame through an advertisement featured on the rear cover of a sports magazine. In this particular case, it was determined that the advertisement conducted by Jewel Food Stores possesses a commercial nature and furthermore seeks to capitalize on the reputation and recognition of Michael Jordan.[107]

The present legal case involving Michael Jordan and Jewel Food Store serves as a pertinent example of how a celebrity can exercise their personality rights when their rights are infringed upon by an individual seeking to exploit the celebrity's likeness for commercial gain. This issue may arise within the NFT space in the future, as evidenced by the presence of NFT marketplaces where NFTs portraying celebrities are being offered for purchase.

Given the nascent nature of NFT technology and the limited number of associated cases, it is challenging to ascertain the potential impact of personality rights on the NFT domain. Moreover, while prominent celebrities may not be preoccupied with financial regulations, such matters would have significant implications for emerging and lesser-known celebrities.

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[105] Valentina Mazza, 'The liability regime of an NFT marketplace for infringing contents' (GamingTechLaw 22 February 2022) <https://www.gamingtechlaw.com/2022/02/liability-nft-marketplaceinfringing-content.html> accessed 16 May 2023.
[106] Jordan v. Jewel Food Stores, Inc. - 743 F.3d 509 (7th Cir. 2014).
[107] *Ibid.*

3.4 Patent Law Implication of Non-Fungible Tokens

The discourse surrounding non-fungible tokens (NFTs) has highlighted a range of potential advantages and challenges for intellectual property (IP) holders within the realm of trademark and copyright legislation. The presence of non-fungible tokens in the field of patents is comparable to other domains, as NFTs have been introducing fresh prospects and obstacles in the patent space for a considerable period.

The current global patent system operates through registers that are maintained by patent authorities at both national and international levels. The main responsibilities of these authorities involve the processing of patent applications, determining their eligibility for protection, and serving as administrative bodies for recording licenses, pledges, or other modifications in relation to the granted patent. These functions can be excessively burdensome, resulting in inefficiencies in terms of time and labour, particularly when it comes to documenting the post grant transactions related to a patent. Non-fungible tokens (NFTs) have the potential to enable the monitoring and documentation of lawful transactions associated with a patent, bypassing the need for involvement from patent offices. For example, an individual seeking to transfer their patent license to another party can execute the transfer without notifying the relevant authorities. This transfer would be automatically documented in the blockchain, providing an opportunity for the authorities to subsequently authenticate the transaction.[108]

Moreover, the transfer of patent ownership can be facilitated through Non-Fungible Tokens (NFTs), which operate on blockchain technology, enabling the tracking of patent ownership. In addition, these non-fungible tokens (NFTs) have the capability to incorporate self-executing contracts, which streamline the process of transferring intellectual property (IP) rights, specifically pertaining to patents, during the transition of ownership from the seller to the buyer.[109] The blockchain system demonstrates functionality in establishing a sequential order of occurrences linked to a patent, which is represented in the form of a non-fungible token (NFT). Smart contracts that are capable of being integrated into a patent non-fungible token (NFT) have the ability to encompass

[108] Jacqueline Salwa, 'Will NFTs revolutionize patent law?' (JD Supra 10 August 2021) <https://www.jdsupra.com/legalnews/will-nfts-revolutionize-patent-law-3657179/> accessed 17 May 2023.
[109] *Ibid*.

a variety of stipulations and provisions as determined by the proprietor. These may include specifications regarding the utilisation of the patent, the duration for which it may be employed, considerations pertaining to sub-licensing, as well as aspects related to its commercialization. Furthermore, the determination of the fair value of a patent can be easily established due to the blockchain's ability to document the complete history of the patent non-fungible token (NFT), including details regarding ownership, licensing, production, litigation, and commercialization.

The establishment of a non-fungible token marketplace for patents necessitates a substantial investment of time and effort. Additionally, patent holders would need to embrace a novel framework for documenting patent rights, encompassing aspects such as ownership, assignment, and licensing. Furthermore, a substantial amount of effort is required to generate the digital renditions of the patent, which are intended for sale as non-fungible tokens (NFTs).

Moreover, the complexity of the process would be heightened in situations where the assignment or licensing of patents occurs without being documented on the blockchain network, resulting in conflicting records of the transaction. However, efforts have already been initiated with regards to the development of a marketplace based on non-fungible tokens (NFTs).[110]

The establishment of a marketplace centered around non-fungible tokens (NFTs) for various asset categories, including patents, necessitates a considerable amount of time and entails the adoption of a novel framework by patent holders in terms of documenting patent ownership, transfers, and licensing. Significant preliminary efforts would be necessary to establish the digital manifestations of ownership pertaining to preexisting patents in the form of non-fungible tokens (NFTs). Challenges may arise in cases where transfers or licenses have been executed but not duly recorded on the blockchain, resulting in conflicting records pertaining to ownership. Nonetheless, efforts have been initiated to address these issues within the marketplace.

[110] Rehman W, 'NFTs: Applications and Challenges' (22nd International Arab Conference on Information Technology ACIT)

The partnership between IBM and IPwe has advocated for the utilisation of non-fungible tokens (NFTs) as a means of safeguarding patent ownership.[111] The collaborating organizations have established a framework for a non-fungible token (NFT) marketplace, wherein the buying and transferring of patent rights via NFTs will be facilitated. The marketplace can serve as a platform not only for the sale of patents but also for the establishment of licensing agreements. The architects of this marketplace posit that it will facilitate businesses in the development and assessment of patent portfolios. It is plausible that patent offices could become participants in the emerging trend, facilitating the utilisation of non-fungible tokens (NFTs) for the purpose of documenting patent-related transactions. For example, the patent office could employ a verification methodology to authenticate the unequivocal ownership of the non-fungible token creator's patent. In the case of recently granted patents, it is conceivable for the patent office to autonomously generate the non-fungible token (NFT) and provide the applicant with the corresponding private key in conjunction with the registration certificate. Subsequent transactions would be promptly reflected on the blockchain, and the registry would document the present condition of the NFT, thereby facilitating automatic updates.

True Return Systems LLC and Boag Law PLLC have initiated the auction process for the U.S. Patent No. 10,025,797, commonly referred to as "the Patent," by utilising a non-fungible token (NFT) on a blockchain server.[112] This specific auction represents the inaugural instance of a patent being sold via a Non-Fungible Token (NFT), as far as current records indicate. These entities have indicated that the NFT being auctioned, along with the associated patent, includes open and active licencing and litigation content. This content is intended to aid the buyer in quickly implementing the patent within their portfolio or business operations.

Although the proposed regime for exchanging NFT-patents offers several advantages, there exist certain obstacles that hinder its implementation. For instance, the transaction

[111] Veronica Combs 'IBM and IPwe want to issue patents as NFTs and make them easier to monetize' (*Tech Republic* 21 April 2021) <https://www.techrepublic.com/article/ibm-and-ipwe-want-to-issue-patentsas-nfts-and-make-them-easier-to-monetize/> accessed 17 May 2023.
[112] 'True Return Systems LLC and D. Tiller Law PLLC Commence Sale of Foundational Blockchain Patent as a Non-Fungible Token (NFT)' (FinTech Futures 20 April 2021) <https://www.fintechfutures.com/techwire/true-return-systems-llc-and-d-tiller-law-pllc-commence-sale-offoundational-blockchain-patent-as-a-non-fungible-token-nft/> accessed 17 May 2023.

involving the sale of a patent and the subsequent licencing agreements would continue to be conducted through traditional offline channels. Non-fungible tokens (NFTs) have the potential to create an impression of dependability in verifying the authenticity of a patent. Consequently, individuals who currently possess or aspire to possess non-fungible tokens (NFTs) will continue to be required to monitor alterations in ownership that occur beyond the confines of the blockchain. Buyers are required to authenticate the ownership of the patent or obtain a guarantee of title from the seller, either through a smart contract or alternative means.

One additional concern pertaining to non-fungible tokens (NFTs) and blockchain assets in a broader sense is their substantial reliance on computational resources, leading to the consumption of significant quantities of electricity and subsequent emission of substantial amounts of carbon dioxide, thereby posing environmental hazards. Furthermore, in addition to utilising NFTs as a means of transferring patents, it is also possible to obtain patents for various inventions derived from NFTs. For example, these inventions may involve verifying the originality of a patent and tracking the ownership of the corresponding tangible asset.

Recently, there has been an observable increase in the number of non-fungible token (NFT) patents that have emerged in various markets. One notable example is the introduction of Cryptokicks by Nike. This patent facilitates users by implementing a mechanism that utilises blockchain technology to seamlessly integrate digital assets with their corresponding physical counterparts, such as shoes.[113]

In the context of Cryptokicks, the activation of the underlying token occurs whenever a transaction pertaining to the sale of the shoe is executed. To enhance the efficiency of this process, the user or owner's identification code is associated with a 10-digit UIC (User Identification Code) and a 10-digit shoe identification code.[114] This linkage effectively connects the owner with the respective shoe. Similar to other Non-Fungible Tokens (NFTs), these tokens also employ the ERC 721 standard and are subsequently recorded

[113] Matthew Beedham, 'Nike now holds patent for blockchain-based sneakers called 'CryptoKicks'' (TNW 10 December 2019) <https://thenextweb.com/news/nike-blockchain-sneakers-cryptokick-patent> accessed 17 May 2023.
[114] *Ibid.*

on the Ethereum blockchain. When an individual purchases a shoe, they will be provided with a non-fungible token (NFT) that is associated with the shoe. This NFT can then be transferred to any subsequent buyer of the shoe, serving as evidence of the shoe's authenticity during the sale transaction.

In addition to facilitating the tracking of shoe ownership, the token will also enable the owner to document various specific details pertaining to the shoe, such as its design, size, colour, material, and so on. Moreover, the patent confers upon the proprietor of the footwear an augmented level of authority and influence. For example, the proprietor of the footwear can exercise authority over the quantity of replicas that can be produced based on the identical design. Furthermore, the proprietor retains the discretion to grant the subsequent purchaser the authority to amalgamate and generate a novel configuration of the footwear.[115]

Similar to the mechanics observed in Cryptokitties, the proprietors of the shoes possess the capability to engage in the act of breeding novel footwear. The act of breeding in question may result in limitations regarding shoe production, as the ownership rights pertaining to the subsequent generation of the shoe will be tied to the initial proprietor. Nike has announced that individuals who possess "CryptoKicks" will be granted the opportunity to engage in the process of combining or reproducing the digital shoe with another digital shoe, resulting in the creation of "shoe offspring" that can be manufactured as a distinct and physical pair of shoes.[116]

[115] *Id.*
[116] *Id.*

CHAPTER - 4

INTERPLAY OF NON-FUNGIBLE TOKENS AND INTELLECTUAL PROPERTY RIGHTS: SIGNIFICANT CASE STUDIES.

Non-fungible tokens (NFTs) are unique digital assets that use blockchain technology to establish ownership and authenticity. They have implications for intellectual property rights (IPR) as they allow artists and creators to prove ownership of their digital creations. NFTs can include smart contracts that define licensing terms and automate royalty payments. They also help combat counterfeiting and establish a verifiable chain of ownership. However, challenges and controversies arise, including potential infringement of existing copyrighted works and disputes over ownership and attribution. Legal frameworks are still evolving, and it is important for stakeholders to consult with legal professionals who specialize in intellectual property to navigate the complex landscape of NFT ownership and licensing.

In summary, NFTs provide a way for artists and creators to establish ownership and authenticity of digital assets. They can define licensing terms and automate royalty payments through smart contracts. NFTs combat counterfeiting and establish ownership chains, but also raise concerns about copyright infringement and disputes over ownership. As legal frameworks evolve, consulting with legal experts is essential for navigating the intersection of NFTs and intellectual property rights.

In addition to the points mentioned earlier, case laws play a crucial role in shaping the legal landscape around NFTs and intellectual property rights. As NFTs are a relatively new phenomenon, there is a limited body of specific legislation that directly addresses their legal implications. Therefore, case laws and legal precedents established through court decisions become significant in guiding the interpretation and application of existing intellectual property laws to NFTs.

Case laws help establish clarity and provide guidance on issues such as copyright infringement, fair use, licensing agreements, and ownership disputes related to NFTs.

They provide a basis for understanding how courts have interpreted intellectual property rights in the context of these digital assets.

Studying and analyzing relevant case laws can assist artists, creators, buyers, and legal professionals in understanding the legal boundaries and best practices when dealing with NFTs. It allows stakeholders to learn from past disputes and legal outcomes, helping to shape their decisions regarding ownership, licensing, and protection of intellectual property in the NFT space.

As NFTs continue to gain prominence and more legal cases emerge, the development of case laws will play a crucial role in further defining the rights, responsibilities, and legal framework surrounding NFTs and intellectual property.

1. Miramax, LLC v. Quentin Tarantino[117]

The recent legal dispute between Miramax and Tarantino pertains to the emerging domain of non-fungible tokens (NFTs). In this instance, the party bringing forth the legal action, referred to as the Plaintiff, Miramax, LLC is a limited liability company incorporated in the state of Delaware, with its primary headquarters located in Los Angeles, California. On the other hand, Quentin Tarantino, the defendant in this case, is a United States citizen who possesses ownership interests in multiple businesses situated in Los Angeles, California. Pulp Fiction (1994), produced by Miramax, is widely regarded as a highly influential film that has left a significant impact on the history of cinema. Notably, it received the esteemed Palme d'Or award at the 1994 Cannes Film Festival. The film "Pulp Fiction" was both written and directed by Quentin Tarantino, with Lawrence Bender serving as the producer. The production of the film involved a collaborative effort between Lawrence Bender and Brown 25 Productions, Inc.[118] According to Miramax, Tarantino has recently made public his intention to conduct an auction of seven distinct scenes from the renowned 1994 cinematic production titled Pulp Fiction, utilising non-fungible tokens (NFTs). As per the recently submitted complaint by Miramax, allegations of copyright and trademark infringement, as well as breach of contract, have been made.

[117] *Miramax, LLC v. Tarantino*, 2:21-cv-08979-FMO-JC (C.D. Cal. Mar. 10, 2022).
[118] Keyur Asarkar, 'Non-Fungible Tokens (NFTs) – An IPR Perspective' International Journal of Legal Science and Innovation [Vol. 4 Iss 1; 793] 2022.

The complaint asserts that the renowned director had transferred and assigned a substantial portion of his rights to Miramax, encompassing the necessary rights to lawfully sell the NFTs in question. Miramax contends in its complaint, filed in a federal court in California, that it procured "comprehensive rights encompassing copyrights and trademarks" for the film from writer and director Tarantino and producer Lawrence Bender in 1993. Additionally, it was argued that although Tarantino retained certain rights through a series of agreements pertaining to the rights in Pulp Fiction, his "limited 'Reserved Rights' are excessively restrictive, preventing him from independently producing, promoting, and selling the Pulp Fiction NFTs." As per the assertions made by the plaintiffs, Tarantino's Reserved Rights were constrained to various domains, including the soundtrack album, music publishing, live performance, print publication, interactive media, theatrical and television sequel and remake rights, as well as television series and spinoff rights.[119] Additionally, it was asserted by the plaintiffs that the defendants endeavoured to unilaterally exploit Miramax's rights to the film Pulp Fiction. The actions of the defendants, which involve infringement, have resulted in and are expected to continue causing confusion, error, and deceit among the pertinent consumer base regarding the origin of the Pulp Fiction NFTs. It is believed that the Pulp Fiction NFTs are derived from, connected to, affiliated with, or otherwise sanctioned by Miramax. Additionally, Miramax claims that it made diligent efforts to inform Tarantino about the project's infringement through a comprehensive cease-and-desist letter, which was delivered to the director two days subsequent to his initial announcement of the venture. Following the issuance of a cease and desist order, Tarantino's intentions to market non-fungible tokens (NFTs) associated with Miramax's intellectual assets escalated and broadened. In response to this perceived injustice, the plaintiff, Miramax, presents three claims for legal remedy, namely.

The allegation made by Miramax pertained to the defendants' violation of both the Original Rights Agreement and the subsequent Tarantino Miramax Assignment. In consideration of valuable compensation, Quentin Tarantino entered into an agreement with Miramax, whereby he granted and transferred all rights to the Film, both currently known and any future iterations, for an indefinite duration and across the entire universe.

[119] *Ibid*

This encompassed the exclusive right to distribute the Film through all existing and future media platforms, with the exception of a specific set of rights that Tarantino retained, known as the "Reserved Rights."

In relation to copyright infringement, with the exception of Tarantino's specific set of Reserved Rights, Miramax holds exclusive ownership of the copyright in the motion picture Pulp Fiction and all its constituent elements throughout all stages of development and production. The defendants have committed direct infringement of Miramax's exclusive rights in the film Pulp Fiction and its constituent elements, thereby violating Section 501 of the Copyright Act, specifically 17 USC § 501. The defendants' alleged infringing conduct, as described in this document, has been and continues to be deliberate and carried out with complete awareness of Miramax's rights pertaining to Pulp Fiction. This conduct has allowed the defendants to unlawfully gain profit from the film. Therefore, Miramax is eligible to receive the highest amount of statutory damages as prescribed by 17 USC § 504(c) due to the deliberate infringement committed by the Defendants. Miramax may also be entitled to additional damages as determined by 17 USC § 504(c).

The unauthorised utilisation of the Pulp Fiction Mark by the Defendants, as stated in this claim, has the potential to mislead consumers regarding the true origin, source, sponsorship, or affiliation of the Pulp Fiction NFTs. This unauthorised use may lead consumers to mistakenly believe, contrary to reality, that the Pulp Fiction NFTs are being sold, authorised, endorsed, or sponsored by Miramax, or that the Defendants have some form of affiliation or sponsorship with Miramax. The conduct of the defendants can be classified as trademark infringement, which is a violation of Section 32(1) of the Lanham Act, specifically 15 USC § 1114(1). The actions of the defendants are currently resulting in immediate and irreparable harm and injury to Miramax, impacting its goodwill and reputation. Unless this Court intervenes and issues an injunction, the ongoing damage to Miramax and the potential confusion among the public will persist.

Ultimately, the plaintiff respectfully requests that the Court issue a judgement order in the following manner: an award of damages, the specific amount of which will be determined during the trial proceedings, or alternatively, the maximum permissible statutory damages

along with any other appropriate amounts, in addition to both prejudgment and post-judgment interest. The plaintiff seeks declaratory relief on the grounds that the defendants have violated their contractual obligations with Miramax, infringed upon Miramax's copyrights pertaining to the film Pulp Fiction, and infringed upon Miramax's trademark rights associated with Pulp Fiction. The requested relief includes an injunction to prevent any future violations of Miramax's rights in and to the film Pulp Fiction, reimbursement of attorneys' fees, reimbursement of Miramax's costs related to the legal proceedings, and any other relief that the Court deems appropriate and fair.

Indian Perspective

In comparing this particular case with the context of India, it can be observed that the aforementioned three infractions of the law would be addressed in accordance with the provisions outlined in the Code of Civil Procedure.

The subject matter of this study encompasses the areas of Procedure (CPC), Copyright Law, and Trademarks Law.

The legal provision of Order 39, Rule 2 of the Civil Procedure Code (CPC) allows for the issuance of a temporary injunction in cases of breach of contract. This injunction can be obtained by the plaintiff through an application to the court, with the purpose of restraining the defendant from engaging in the alleged breach of contract or causing any harm or similar breach of contract related to the same contract or property or right. The Court has the authority to issue an injunction through an order, which may include provisions regarding the duration of the injunction, the requirement to keep an account, the provision of security, or any other terms deemed appropriate by the Court.[120]

The Copyright Act of 1957 provides copyright owners with the ability to pursue three pecuniary remedies as outlined in Section 55 and 58, in cases of copyright infringement.

Initially, an account of profits is a legal mechanism that enables the proprietor to pursue the monetary amount generated as a result of profit derived from illicit activities. Secondly, compensatory damages allow the copyright owner to pursue reparation for the

[120] *Ibid.*

harm they have incurred as a result of the infringement. Thirdly, the assessment of conversion damages is based on the intrinsic value of the article in question.

In the case of trademark infringement, the principle of passing off becomes relevant as the unauthorized utilization of the Pulp Fiction Mark is likely to mislead consumers into believing, incorrectly, that the Pulp Fiction NFTs are being sold, authorized, endorsed, or sponsored by Miramax, or that the Defendants have some form of affiliation or sponsorship with Miramax.

Therefore, in accordance with Section 135(1) of the Trademarks Act of 1999 (TMA), the plaintiff who successfully establishes a case of infringement and passing off may be entitled to the following remedies:

An injunction has been sought to prohibit any further utilisation of the trademark. The grant of an injunction is a legally recognised entitlement explicitly stipulated in the Trade Marks Act of 1999. The regulations pertaining to the issuance of injunctions in trademark disputes are derived from the stipulations outlined in Sections 36 to 42 of the Specific Relief Act, 1963, as well as Order 39 Rule 1 and 2 in conjunction with Section 151 of the Code of Civil Procedure.

The provision of damages entails the granting of compensatory damages to the plaintiff in order to reimburse them for the losses they have incurred. Conversely, punitive damages are intended to discourage both the wrongdoer and others with similar inclinations from engaging in unlawful activities.

2. TamarindArt, LLC v. Husain [121]

TamarindArt LLC, a prominent collector and dealer specialising in Indian art, initiated legal proceedings on January 21, 2022, against the administrators responsible for managing the estate of the esteemed artist Maqbool Fida Husain. The purpose of this lawsuit was to seek a formal declaration affirming that Tamarind's NFT initiative, featuring Husain's artwork, did not violate any rights held by the estate. As per the complaint, Tamarind acquired a mural measuring 60 feet in length titled "Lightning" (1975) from the artist for a sum of $400,000 in 2002. The complaint further notes that

[121] *TamarindArt LLC v. Husain et al.*, No. 22-cv-595, (S.D.N.Y. Jan. 21, 2022).

this particular artwork was frequently referred to as "the Guernica of India." Tamarind has recently initiated a marketing campaign aimed at promoting the sale of non-fungible tokens (NFTs) that are derived from artistic creations. The estate issued a cease-and-desist letter to Tamarind, asserting that Tamarind's intention to commercialise non-fungible tokens (NFTs) derived from the artwork would infringe upon the estate's copyright ownership of said work.[122]

Tamarind is requesting a judicial determination regarding the potential infringement of rights held by the estate, in relation to its intended non-fungible tokens (NFTs). The case of TamarindArt, LLC v. Husain et al., with the index number 1:22-cv0595-AT, is being heard in the Southern District of New York. According to the documentation provided by Tamarind, the artist has affixed their signature to a bill of sale, thereby transferring ownership of the artwork to Tamarind.[123] Additionally, this agreement grants Tamarind an exclusive, royalty-free, and global license to exhibit, promote, duplicate, and resell the artwork in its entirety or any portion thereof, including all associated intellectual property rights. According to Tamarind, it is claimed that an additional agreement was entered into between Tamarind and the artist in 2003. This agreement purportedly stated that all artworks that were previously acquired or produced for Tamarind or its affiliates are recognised as copyright protected property belonging to Tamarind or its affiliates. Tamarind argues that this agreement effectively eliminated any remaining rights that the estate may have had in the artwork, thereby establishing Tamarind as the copyright holder of the work. The estate, on the other hand, has not yet submitted a response to the complaint.[124]

The present case prompts inquiries regarding the legal entitlements associated with the creation and distribution of non-fungible tokens (NFTs) derived from artistic works. Typically, according to United States legislation, an artist maintains the copyright in a piece of work, encompassing the exclusive entitlement to reproduce and distribute images

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[122] Abhishek Sharma, 'Interrelationship between Non-Fungible Token and Intellectual Property Rights: A Study' (LL.M. Dissertation, National Law University and Judicial Academy, Assam 2022) <http://www.dlnluassam.ndl.iitkgp.ac.in/> accessed 4 May 2023.

[123] *Ibid.*

[124] 'Hefty Art brings MF Husain's paintings to the metaverse; exclusive partner for NFTs' (The Times of India 1 February 2022 <https://timesofindia.indiatimes.com/spotlight/ hefty-art-brings-mf-husains-paintings-to-the-metaverse-exclusive-partner-for-nfts/articleshow/89242719.cms> accessed 5 May 2023.

of said work, following its sale, unless a contractual arrangement is established that grants the buyer a license or copyright assignment. In this instance, the court will be tasked with the responsibility of analysing and implementing the contractual agreements that the parties are purported to have executed. The objective is to ascertain whether Tamarind possesses the requisite authority to produce currency. In light of the recent surge of activity within the non-fungible token (NFT) domain and the subsequent haste to enter the market, it is reasonable to anticipate a rise in conflicts pertaining to the transaction and promotion of NFTs associated with artistic assets.

3. Hermes International v. Rothschild[125]

Rothschild's collection of non-fungible tokens (NFTs), known as "MetaBirkins," portrays fur-adorned handbags that are deliberately designed to resemble the renowned Hermès Birkin bag. The Hermès Birkin bag has acquired significant cultural significance as a representation of affluence and exclusivity. The NFTs were sold by Rothschild to individual buyers on the blockchain, with prices reaching several thousand dollars per unit.

Hermès initiated legal proceedings against Rothschild on January 14, 2022, by filing a lawsuit in the Southern District of New York. The lawsuit alleges various violations, including trademark infringement, false designation of origin, false descriptions and representations, trademark dilution under the Lanham Act, cybersquatting under the Anti-Cybersquatting Consumer Act, as well as state law claims for common law trademark infringement, misappropriation, and unfair competition. The complaint contended that Rothschild employed the moniker "MetaBirkins" in a manner that could potentially deceive consumers by creating a false impression of association between the NFTs and the esteemed Hermès brand. Furthermore, it was argued that this alleged misrepresentation has enabled the artist to derive financial gains from the positive reputation and public trust associated with Hermès[126]. On March 2, 2022, Hermès submitted an amended complaint that included a collection of instances purportedly

[125] *Hermes Int'l v. Rothschild*, 22-cv-384 (JSR) (S.D.N.Y. Jun. 23, 2023)
[126] *Ibid.*

demonstrating consumer confusion, as evidenced by Instagram comments and media reports.

On March 21, 2022, Rothschild submitted a motion seeking the dismissal of the amended complaint. The motion contends that the utilisation of the term "MetaBirkins" as the title for the artwork, specifically referring to the digital representations of the Birkin bags adorned with fur, does not function as a means of identifying the origin of his products. Consequently, Rothschild argues that his use of Hermès's trademark is eligible for protection under the First Amendment. According to the legal standard established in the case of Rogers v. Grimaldi, the use of a trademark without authorization is permissible if it meets two criteria: it must be artistically relevant and it must not explicitly deceive consumers. Judge Rakoff granted permission for the amended complaint to proceed, opting not to make a determination at the initial stage of the legal process regarding whether Rothschild's "MetaBirkins" meet the admittedly minimal requirement of artistic relevance. The court additionally determined that Hermès has made a satisfactory claim that Rothschild's utilization of the "MetaBirkins" trademark is deceptive and subject to legal action in accordance with the Lanham Act.[127]

Both Rothschild and Hermès submitted cross-motions for summary judgement, although it is uncommon for trademark infringement claims to be resolved through summary judgement. On February 2, 2023, Judge Rakoff rendered an opinion wherein he determined that significant matters of material fact persist regarding the claims made by both parties. Consequently, the judge denied the cross-motions presented by the parties in their entirety. In the process, the court rendered several significant determinations.

Initially, the court reached the determination that the Rogers test, rather than the Gruner + Jahr test, is applicable to the purported infringement of Hermès's trademarks. The Gruner + Jahr test pertains to the evaluation of alleged infringement of works primarily intended for commercial purposes. The court's ruling was partially influenced by the characteristics of the "MetaBirkin" non-fungible tokens (NFTs) under consideration. Individuals acquire non-fungible tokens (NFTs) with the intention of obtaining exclusive

[127] Isaiah Poritz, 'Hermès Gets Win Over MetaBirkins in First NFT Trademark Trial' <https://www.bloomberglaw.com/bloomberglawnews/iplaw/BNA%20000001860846d4f7aba67a7e63420000?bna_news_filter=ip-law> accessed June 8 2023.

ownership of the associated content, rather than merely possessing a detached "digital deed" devoid of any other asset. In this instance, the digital representation of one of Rothschild's distinctive "MetaBirkins" is being referred to. Although Hermès presented evidence that could lead a reasonable juror to infer that Rothschild's endeavor had a commercial rather than artistic purpose, the court determined that this evidence does not prevent the application of the Rogers test. According to this test, a court cannot deprive an artistic work of First Amendment protection solely because the artist intends to market and sell their creative output.

Furthermore, during the assessment of the initial element of the Rogers test, namely "artistic relevance," the court determined that there exists the possibility of reasonable divergence among jurors regarding the origin of Rothschild's "MetaBirkins." Specifically, the court questioned whether these creations were a result of authentic artistic expression or rather an unlawful intention to exploit the iconic Birkin handbags produced by Hermès.[128]

Ultimately, in light of the conflicting evidence presented, the court chose not to undertake an evaluation of the Polaroid factors. These factors are typically considered by courts when analyzing the second aspect of the Rogers test, which pertains to determining whether the artistic work in question is "explicitly misleading." As an illustration, Hermès provided survey data indicating that 18.7% of potential NFT consumers were uncertain about the connection between Hermès and the "MetaBirkins" project. This percentage aligns with the commonly accepted notion in legal proceedings that it is indicative of confusion within the market. Hermès additionally highlighted the presence of indications suggesting that both social media users and the media exhibited a state of perplexity regarding its involvement in the project. Rothschild contested the survey methodologies utilized by Hermès and posited that social media posts are insufficient in demonstrating genuine perplexity. However, the court determined that these matters, along with any other matters pertaining to Hermès's additional allegations against Rothschild, should be reserved for the jury's deliberation.

The company Hermès emerges victorious in the legal proceedings.

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[128] *Ibid.*

The jury rendered a verdict on February 8, 2023, ruling in favour of Hermès. The jury determined that the "MetaBirkins" exhibit characteristics more akin to consumer products, thereby subjecting them to trademark laws, rather than being classified as artistic creations protected under the First Amendment. In the process, they reached a consensus that Rothschild effectively leveraged Hermès's positive reputation in order to generate financial gain.

During the legal proceedings, the legal representatives of Hermès introduced a substantial number of text messages as evidence to support the claim of intent. Rothschild expressed a desire to establish a comparable level of exclusivity and demand for the renowned handbag, emphasising the lucrative potential of the venture. The attorneys contended that artists have the legal right to generate income from their artistic creations, and emphasised that the scope of trademark rights is constrained by the protections afforded under the First Amendment. The exclusion of New York art critic Blake Gopnik, who is considered Rothschild's primary expert in the field of profitable yet legal 'business art', from the trial was prompted by Hermès' contention that his expertise in art history lacks reliable data and a clear methodology.[129]

The jury rendered a verdict in favour of Hermès, granting them a total sum of $133,000 as compensation for the violations of trademark infringement and cybersquatting. This amount is divided into two components: $110,000, which represents the profits and resale commissions obtained by Rothschild, and an additional $23,000 designated specifically for the act of cybersquatting.

The potential filing of an appeal by Rothschild is yet to be determined. The jury's verdict in favor of Hermès constitutes a significant triumph. However, it is advisable for companies to proactively undertake measures to safeguard their trademarks in the realm of digital platforms. These measures may include:

The proposition involves the extension of trademark enforcement efforts to encompass NFT marketplaces.

[129] Muzamil Huq ‘Hermès Successfully Defends its Trademark in the Metaverse’ Morrison Foerster 09 Feb 2023 <https://mofo-pdf-2.netlify.app/230209-hermes-successfully-defends-trademark-metaverse.pdf> accessed 9 June 2023.

Expanding watch monitoring services to educational settings where trademark applications for goods and services related to non-fungible tokens (NFTs) are frequently submitted.

The Hermès case sets a precedent for companies seeking to protect their trademark rights in federal court, highlighting the importance of prompt legal action. Additionally, companies planning to venture into the NFT industry should contemplate the registration of trademarks for their relevant goods or services with the United States Patent and Trademark Office.[130]

The relationship between NFTs and IPRs gives rise to a fluid and developing environment that carries substantial legal ramifications. The aforementioned case studies provide insights into important factors to be taken into account, including copyright ownership, licencing agreements, rights of publicity, derivative works, and platform terms of service. As the market for non-fungible tokens (NFTs) expands, various parties such as artists, creators, collectors, platforms, and regulators are faced with the task of managing the intricacies involved. Their objectives encompass safeguarding intellectual property rights (IPR), ensuring adherence to legal requirements, and promoting the advancement of new ideas.

The establishment of explicit guidelines and legal frameworks that specifically cater to the distinct attributes of non-fungible tokens (NFTs) is of utmost importance in upholding trust, transparency, and equity within the NFT ecosystem. The establishment of collaborative efforts among legal professionals, industry actors, and regulatory entities is imperative in order to achieve a harmonious equilibrium between the facilitation of innovation and the safeguarding of the rights and interests of all relevant parties. Through the examination of notable case studies and the examination of the legal ramifications, we can make a valuable contribution to the establishment of a comprehensive and enduring framework for the interaction between NFTs and IPRs.

[130] Pete Brush, 'MetaBirkin' NFT Maker Held Liable in Key TM Trial' <https://www.law360.com/ip/articles/1572690?nl_pk=4c38749e-5f7e-4281-bc5cfb8f61f1a811> accessed 8 June 2023.

CHAPTER - 5

LEGAL FRAMEWORK OF INTELLECTUAL PROPERTY RIGHTS IN RELATION TO NFT.

The legal landscape pertaining to intellectual property rights (IPR) concerning Non-Fungible Tokens (NFTs) is currently in a state of flux and exhibits jurisdictional discrepancies. Non-fungible tokens (NFTs) are distinct digital assets that commonly rely on blockchain technology and are frequently linked to digital art, collectibles, and various other forms of digital content.

The domain of intellectual property law that holds significant relevance to non-fungible tokens (NFTs) is copyright. Copyright provides authors or creators of original works with exclusive privileges, enabling them to exercise authority over the replication, dissemination, and public exhibition of their artistic productions. The role of copyright ownership and licensing of the underlying digital content, such as artwork or music, is of utmost importance in the context of NFTs. In numerous legal jurisdictions, the individual responsible for the creation of a work is inherently granted the exclusive rights to the copyright of said work. Nevertheless, it is crucial to acknowledge that mere possession of an NFT does not automatically confer copyright ownership of the underlying content upon the owner. It is imperative to explicitly address and transfer the copyright ownership and licensing rights in a distinct manner, separate from the ownership of the non-fungible token (NFT) itself. Contracts and licensing agreements are frequently employed in order to provide clarity regarding the rights and permissions pertaining to non-fungible tokens (NFTs). These agreements have the ability to delineate the extent of usage rights, reproduction rights, as well as any limitations or conditions pertaining to the utilization of the copyrighted content. In addition, it is possible to incorporate clauses pertaining to royalties or revenue-sharing agreements in the event of the resale of non-fungible tokens (NFTs).

Trademarks are an additional aspect of intellectual property rights (IPR) that may be relevant in the context of non-fungible tokens (NFTs), specifically concerning the usage of brand names or logos associated with the digital content. Trademarks serve as a means

of safeguarding unique symbols or signs that serve to identify and differentiate goods or services within the commercial sphere. In the event that a brand or logo becomes linked to a non-fungible token (NFT), it is plausible for trademark legislation to be invoked in order to prohibit unauthorized utilization or infringement.

Moreover, the legal structure pertaining to non-fungible tokens (NFTs) may also intersect with other domains of intellectual property, such as patent or design rights, contingent upon the characteristics of the fundamental digital assets.

5.1 Inflexibilities in the Current Legal Framework of IPR

The existing Intellectual Property Rights (IPR) framework encounters various obstacles in relation to Non-Fungible Tokens (NFTs). The challenges discussed are a direct result of the distinct characteristics of NFTs as digital assets and the decentralized structure of blockchain technology. The present intellectual property rights (IPR) regime pertaining to non-fungible tokens (NFTs) is accompanied by several challenges.

The ownership and infringement of copyright is one such challenge. Non-fungible tokens (NFTs) frequently encompass the process of tokenizing and commercialising digital artworks, music, or other forms of copyrighted material. The process of ascertaining copyright ownership and enforcing rights in relation to non-fungible tokens (NFTs) can present intricate challenges. Although the non-fungible token (NFT) serves as evidence of both authenticity and ownership, it does not inherently confer copyright ownership. The existing intellectual property rights (IPR) framework encounters difficulties in effectively tackling the issues pertaining to copyright infringement and unpermitted utilisation of copyrighted content within the non-fungible token (NFT) ecosystem.[131]

The issue of clarity in licensing arises in the context of NFTs, giving rise to inquiries regarding licensing agreements and royalty arrangements.[132] The existing intellectual property rights (IPR) framework may lack explicit directives regarding the establishment,

[131] Rehman W, 'NFTs: Applications and Challenges' (22nd International Arab Conference on Information Technology ACIT)
[132] Wang Q, 'Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges' (ResearchGate May 2021)

enforcement, and monetization of licenses within the non-fungible token (NFT) domain. Consequently, individuals involved in the creation and collection of non-fungible tokens (NFTs) may encounter challenges when it comes to the negotiation and execution of licensing agreements. This can give rise to possible conflicts and legal ambiguities.

The verification of authenticity and provenance poses significant challenges in the context of Non-Fungible Tokens (NFTs), as these tokens depend on the utilisation of blockchain technology. Nevertheless, the task of confirming the authenticity and credibility of the underlying information remains a formidable endeavour. The intellectual property rights (IPR) regime currently lacks standardised mechanisms for the authentication of NFTs and the assurance of the accuracy of the information stored on the blockchain. The potential consequences of this phenomenon include apprehensions surrounding the trade of counterfeit or unauthorised non-fungible tokens (NFTs), thereby eroding the credibility and worth of the NFT market.

The issue of cross-border jurisdiction arises in the context of NFT transactions, which take place on a worldwide level and involve participants from diverse legal jurisdictions that have different intellectual property rights (IPR) laws and regulations. The existing intellectual property rights (IPR) framework may lack efficient mechanisms for resolving cross-border conflicts and ensuring the enforcement of rights in international non-fungible token (NFT) transactions. The development of consistent legal frameworks that safeguard the rights of creators and collectors in cross-border non-fungible token (NFT) transactions necessitates harmonisation efforts and international cooperation.[133]

The utilisation of non-fungible tokens (NFTs) frequently entails the process of tokenizing individual identities, including those of renowned individuals or public figures, thereby raising concerns pertaining to rights of publicity and privacy. The utilisation of an individual's image or persona in non-fungible tokens (NFTs) without proper authorization gives rise to apprehensions regarding the protection of rights pertaining to publicity and privacy. The existing intellectual property rights (IPR) framework may not offer adequate measures to safeguard the rights of individuals and ensure their informed consent is obtained for the commercialization of their identities via non-fungible tokens (NFTs).

[133] *Ibid.*

The absence of clear regulations and safeguards for consumers has become a prominent concern in light of the swift expansion of the non-fungible token (NFT) market. Nevertheless, the existing intellectual property rights (IPR) framework may lack well-defined guidelines or regulatory supervision that specifically address non-fungible tokens (NFTs). The aforementioned issues give rise to apprehensions regarding the safeguarding of consumer interests, implementation of anti-money laundering protocols, taxation policies, and the protection of investor rights within the NFT ecosystem. The pressing challenge lies in the development of regulatory frameworks that effectively address these concerns while simultaneously promoting innovation and creativity.[134]

The existing intellectual property rights (IPR) framework encounters notable difficulties in accommodating the distinctive attributes of non-fungible tokens (NFTs). The current regime exhibits deficiencies in offering explicit guidelines and legal certainty in various domains, including copyright ownership, licencing, authenticity, cross-border jurisdiction, rights of publicity, and consumer protection. Resolving these issues necessitates a collective endeavor involving legislators, legal scholars, industry stakeholders, and regulatory entities to guarantee that the intellectual property rights framework effectively safeguards the rights and interests of creators, collectors, and the broader non-fungible token (NFT) ecosystem.[135]

5.2 Digital Rights Management and NFTs

Digital Rights Management (DRM) encompasses a collection of technologies, methodologies, and approaches utilized for the purpose of governing and overseeing the accessibility, utilization, and dissemination of digital content. Digital Rights Management (DRM) is a mechanism designed to safeguard the rights and interests of individuals involved in the creation, distribution, and ownership of content. It achieves this by imposing limitations on the copying, sharing, modification, and accessibility of digital content by end-users.

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[134] *Ibid.*

[135] Keyur Asarkar, 'Non-Fungible Tokens (NFTs) – An IPR Perspective' (2022) 4 (1) IJLSI

The main purpose of Digital Rights Management (DRM) is to deter the unauthorized utilization, replication, or dissemination of digital media, encompassing music, films, e-books, software, and other digital resources. To enforce these restrictions, a range of encryption, watermarking, and access control mechanisms are utilized.[136]

Digital Rights Management (DRM) systems commonly employ digital encryption techniques to safeguard content from unauthorized access or reproduction. Encryption algorithms are employed to obfuscate the content, rendering it inaccessible or illegible to individuals lacking authorization. Individuals possessing the requisite keys or licenses possess the ability to decrypt and gain access to the content.

Digital Rights Management (DRM) can utilize licensing and access control mechanisms as a means of governing the utilization and dissemination of digital content. Content providers have the ability to bestow certain permissions or enforce restrictions on the utilization of content. These limitations may include constraints on the number of devices on which the content can be accessed, limitations on the duration of access, or the necessity of periodic license renewals[137].

Although the primary objective of DRM is to protect intellectual property rights and mitigate piracy, it has become a topic of considerable contention and scrutiny. There exists a contention that digital rights management (DRM) can exhibit an excessive level of restrictiveness, thereby impeding users' entitlements to fair use, interoperability, and freedom of expression. Critics additionally highlight that digital rights management (DRM) can give rise to compatibility challenges across various devices or platforms, cause user inconvenience, and impede innovation.

In general, digital rights management (DRM) is a technology-based strategy utilized to safeguard and regulate digital content. Its primary objective is to find a middle ground between the rights of content owners and the interests of users, all while addressing the issues associated with piracy and the unauthorized dissemination of digital materials.

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[136] Conor Roach, 'What is Digital Rights Management (DRM)? (The Definitive Guide)' <https://www.digitalguardian.com/blog/what-digital-rights-management> accessed 7 June 2023

[137] *Ibid.*

Non-Fungible Tokens (NFTs) and Digital Rights Management (DRM) are discrete concepts pertaining to the administration and proprietorship of digital assets. However, they possess distinct objectives and entail divergent ramifications.

Non-fungible tokens (NFTs) are a class of cryptographic tokens that serve as a means to establish ownership or provide evidence of the genuineness of a distinct digital item or asset, encompassing domains such as artwork, collectibles, music, and virtual real estate. In contrast to cryptocurrencies such as Bitcoin or Ethereum, which possess fungibility and can be interchanged on a one-to-one ratio, each non-fungible token (NFT) possesses a distinct identifier and cannot be exchanged on an equivalent basis. Non-fungible tokens (NFTs) are commonly constructed using blockchain technology, with Ethereum being the prevailing platform. These tokens offer a transparent and secure mechanism for validating ownership and facilitating the exchange of digital assets.

In contrast, digital rights management (DRM) pertains to the safeguarding and administration of digital content, encompassing various forms such as music, films, electronic books, and software. Digital Rights Management (DRM) systems are specifically engineered to impose limitations on the manner in which digital content can be obtained, replicated, distributed, or altered. Digital Rights Management (DRM) technology employs a combination of encryption, access controls, and licensing mechanisms to effectively deter and mitigate unauthorized utilization, dissemination, or piracy of digital content.

Although NFTs and DRM pertain to distinct facets of digital assets, there exists a possibility of convergence or potential amalgamation between the two.[138]

The utilization of non-fungible tokens (NFTs) offers a means to establish and verify ownership and authenticity pertaining to digital assets. Through the process of minting a non-fungible token (NFT), creators have the ability to establish a distinct identification and associate ownership rights with their digital creations. The relevance of non-fungible tokens (NFTs) in digital rights management (DRM) systems lies in their ability to function as digital certificates of authenticity or ownership. By utilizing NFTs, DRM

[138] *Ibid.*

systems can effectively verify the legitimacy and authorization of accessed or distributed content.

The integration of DRM systems with Non-Fungible Tokens (NFTs) has the potential to enhance security measures and provide increased levels of protection and control. Non-fungible tokens (NFTs) have the potential to serve as a mechanism for effectively administering licenses and regulating access permissions pertaining to digital content. By associating a non-fungible token (NFT) with a digital asset protected by digital rights management (DRM), the monitoring and control of ownership and usage rights can be enhanced, thereby offering a decentralized and transparent approach for content owners to enforce DRM limitations.

The introduction of non-fungible tokens (NFTs) has brought forth the notion of creator royalties, enabling artists to receive a portion of the proceeds generated from the resale of their NFTs within the secondary market. This can also be applicable within Digital Rights Management (DRM) systems, wherein individuals who create content or hold copyright can receive compensation in the form of royalties or licensing fees when their DRM-protected content is accessed, shared, or sold.

It is important to acknowledge that the convergence of non-fungible tokens (NFTs) and digital rights management (DRM) is a dynamic field that continues to develop. Numerous technical, legal, and ethical factors necessitate careful examination and resolution. The intricate nature of striking a balance between safeguarding intellectual property rights and guaranteeing user freedoms and fair use necessitates meticulous deliberation and cooperation among content creators, technology developers, and users.

The World Intellectual Property Organization (WIPO) World Copyright Treaty, commonly referred to as the WIPO Copyright Treaty (WCT)[139], is an international accord designed to establish a comprehensive structure for safeguarding copyright in the era of digital technology. The adoption of the aforementioned measure took place in the year 1996, subsequently coming into effect in 2002. The World Intellectual Property Organization Copyright Treaty (WCT) aims to tackle the difficulties presented by digital

[139] WIPO Copyright Treaty, Dec. 20, 1996, S. Treaty Doc. No. 105-17 (1997); 2186 U.N.T.S. 121; 36 I.L.M. 65 (1997)

technologies in relation to copyright owners. It achieves this by setting forth a set of baseline criteria for safeguarding copyrighted materials within the digital realm. The scope of copyright protection is expanded to encompass digital works, including computer programs, databases, and multimedia creations. This expansion guarantees that authors and other right holders retain authority over the utilization and dissemination of their works within the digital domain.

The recognition of technological protection measures, commonly referred to as digital rights management (DRM), is a crucial element of the World Copyright Treaty (WCT). Digital Rights Management (DRM) encompasses the utilization of technological instruments and mechanisms to regulate and govern the accessibility and utilization of digital content. The utilization of copyright protection is implemented by owners of intellectual property in order to deter the unauthorized replication, dissemination, and modification of their creative works.

The World Copyright Treaty (WCT) recognizes the validity of digital rights management (DRM) systems and promotes the advancement and application of efficient technological safeguards. It acknowledges the significance of these measures in guaranteeing the proper and secure utilization of copyrighted materials within the digital realm. Nevertheless, the treaty places significant emphasis on the necessity of achieving a harmonious equilibrium between the concerns of copyright proprietors and the entitlements of users and consumers. Although the World Copyright Treaty (WCT) advocates for the implementation of Digital Rights Management (DRM), it also incorporates provisions that protect specific user rights and allow for exceptions to copyright. As an illustration, it acknowledges the entitlements of users to produce ephemeral reproductions of intellectual works for technical or transient objectives, such as caching or buffering.

Additionally, it safeguards the autonomy of nations to establish restrictions and exemptions to copyright, such as fair use or fair dealing provisions, in order to guarantee public accessibility to copyrighted materials for educational, research, and critical purposes.[140] The WIPO Copyright Treaty (WCT) is an international agreement that sets

[140] Ibid.

forth standardized measures for safeguarding copyright in the era of digital technology. The acknowledgment is made regarding the significance of digital rights management (DRM) in serving as a mechanism for copyright holders to exercise control over the utilization of their intellectual property within the digital domain.

Nevertheless, the objective of copyright law is to achieve equilibrium by considering the concerns of both copyright owners and users. This is accomplished by safeguarding specific user rights and permitting the implementation of limitations and exceptions to copyright.

CHAPTER - 6

CONCLUSION

In recent years, there has been a notable surge in the popularity of Non-Fungible Tokens (NFTs) as a method for establishing ownership or verifying the authenticity of digital assets. Non-fungible tokens (NFTs) possess the capability to tokenize an extensive array of digital assets, encompassing digital art, music, videos, virtual real estate, and various other forms. Nevertheless, the convergence of NFTs and IPR gives rise to numerous legal obstacles and intricacies that necessitate meticulous examination and evaluation.

Copyright ownership is a prominent legal concern pertaining to non-fungible tokens (NFTs). Non-fungible tokens (NFTs) frequently serve as representations of digital assets that potentially encompass copyrighted works. An illustrative instance involves the utilization of a non-fungible token (NFT) to symbolize a digital artwork produced by an artist. The act of producing and trading non-fungible tokens (NFTs) without proper authorization, particularly when derived from copyrighted materials, has the potential to encroach upon the legal rights of the original creator. In instances of this nature, both the NFT platform and the individuals implicated in the production and transaction of the NFT could potentially incur legal responsibility for infringing upon copyright.

In order to effectively tackle this matter, it is imperative to establish unambiguous guidelines and regulations that guarantee adherence to copyright laws within the realm of NFTs. This entails the identification and establishment of the rights and obligations pertaining to the various entities involved, namely the primary creator, the non-fungible token (NFT) platform, and the buyers. Furthermore, it is imperative to establish mechanisms that facilitate the acquisition of appropriate permissions and licenses for copyrighted works integrated into Non-Fungible Tokens (NFTs). This measure is crucial in safeguarding the rights of creators and mitigating the risk of potential legal conflicts.

Non-fungible tokens (NFTs) are dependent on the utilization of blockchain technology, which offers an unalterable ledger of ownership and the historical background of an asset. Nevertheless, instances of illicit production and commercialization of non-fungible

tokens (NFTs) derived from pre-existing digital creations have been documented, thereby engendering apprehensions regarding the legitimacy of said assets. In certain cases, individuals have encountered situations where their digital creations were tokenized and subsequently traded as non-fungible tokens (NFTs) without their explicit awareness or consent.

In order to effectively tackle these concerns, it is imperative to implement robust mechanisms that can verify the authenticity of the subject matter. The implementation of transparent record-keeping on the blockchain is essential in guaranteeing the origin and legitimacy of the digital assets that are represented by non-fungible tokens (NFTs). The incorporation of industry standards and optimal methodologies for authentication and verification procedures can contribute to the establishment of trust and assurance within the NFT market.

Smart contracts are of utmost importance in facilitating transactions involving non-fungible tokens (NFTs), as they are responsible for overseeing and enforcing the terms and conditions associated with the sale and transfer of these digital assets. Nevertheless, the utilization of smart contracts has the potential to give rise to conflicts and uncertainties in contractual agreements. Disputes may arise in the event that the terms of a smart contract are inadequately defined or if there exists a discrepancy between the specified terms and the actual transaction.

Ensuring the legal enforceability of smart contracts and establishing comprehensive terms that safeguard the rights of all parties involved are of paramount importance. This encompasses the precise delineation of ownership rights, the capacity for transfer, and any supplementary stipulations or limitations linked to the non-fungible tokens (NFTs). In the occurrence of a disagreement, it is imperative to establish mechanisms that can effectively address conflicts and ensure the enforcement of contractual obligations. This is crucial in order to offer clarity and legal remedies for all parties involved.

The utilization of non-fungible tokens (NFTs) to portray prominent figures, including celebrities and athletes, has prompted apprehensions regarding the right of publicity. The unpermitted utilization of an individual's image or likeness for non-fungible tokens

(NFTs) in the absence of appropriate permissions may give rise to legal disputes. Preserving the confidentiality of personal identities and safeguarding privacy rights assumes paramount importance within the realm of non-fungible tokens (NFTs) to prevent encroachments upon an individual's prerogative to exercise authority over the commercial exploitation of their likeness.

It is imperative to establish explicit guidelines and regulations to govern the utilization of individuals' identities, thereby ensuring the acquisition of appropriate permissions and licenses when producing and commercializing non-fungible tokens (NFTs) that incorporate an individual's likeness. This entails the acquisition of consent from individuals and the establishment of mechanisms to address any potential privacy concerns or infringements.

The NFT market's global reach presents challenges stemming from the divergent intellectual property laws and regulations observed across different jurisdictions. The decentralized nature of NFT creators, platforms, and purchasers poses challenges in terms of legal navigation.

In order to effectively tackle these challenges, it is imperative to establish international collaborations and undertake harmonization efforts. The implementation of a cohesive legal framework for NFTs that upholds and safeguards IPR irrespective of geographical limitations would promote the advancement of novel ideas and facilitate international transactions. The proposed course of action entails the harmonization of legal statutes and regulations pertaining to copyright, trademarks, privacy, and consumer protection. The objective is to establish a coherent and foreseeable legal framework that encompasses all stakeholders within the NFT ecosystem.

The expansion of the NFT market has prompted regulatory authorities to closely examine the sector in order to verify adherence to current legislation. This encompasses the examination of possible instances of fraud, manipulation of markets, and concerns related to safeguarding consumer interests. It is imperative to establish explicit guidelines, regulatory frameworks, and robust consumer safeguards in order to safeguard the

interests of consumers and investors, as well as to cultivate an environment of trust and transparency within the NFT ecosystem.

The development of a specialized legal framework specifically designed for non-fungible tokens (NFTs) is of growing significance due to the distinct characteristics and challenges associated with this emerging digital asset. The proposed legal framework, commonly known as a *sui generis* law, would incorporate explicit provisions to accommodate the complexities of non-fungible tokens (NFTs) and effectively tackle the unique legal challenges they present.

The implementation of a unique legal framework specifically designed for non-fungible tokens (NFTs) would foster a conducive environment for innovation, safeguard the interests of creators and consumers, and facilitate the expansion of the NFT market, all while remaining adaptable to forthcoming technological developments. This would enhance transparency regarding copyright ownership, verification of authenticity, fulfilment of contractual obligations, protection of rights related to publicity and privacy, facilitation of cross-border transactions, and adherence to regulatory requirements.

The multifaceted legal ramifications of Non-Fungible Tokens (NFTs) in the context of Intellectual Property Rights necessitate meticulous examination. In order to establish a sustainable and legally compliant non-fungible token (NFT) ecosystem, it is imperative to address copyright ownership, ensure authenticity and provenance, establish clear contractual terms, protect rights of publicity and privacy, harmonize cross-border transactions, and ensure regulatory compliance. A customized legal framework designed specifically for non-fungible tokens (NFTs), such as a *sui generis* law, has the potential to offer the required direction and transparency in addressing the intricate legal matters associated with NFTs. This framework can also foster the responsible and inventive utilization of NFTs.

6.1 Findings

The intellectual property rights (IPR) regime can provide certain safeguarding measures for owners of non-fungible tokens (NFTs), although the application and effectiveness of these measures may vary depending on the specific circumstances and jurisdiction.

Non-fungible tokens (NFTs) are distinct digital assets that are securely stored on a blockchain, enabling them to serve as representations of diverse forms of digital content, including but not limited to art, collectibles, music, and virtual real estate. Although NFTs do not inherently confer intellectual property rights, they have the potential to be linked to or symbolize copyrighted works or other types of intellectual property. As an illustration, an NFT has the potential to symbolize a digital artwork, with the associated copyright being held by the original creator.

There are several mechanisms through which the intellectual property rights (IPR) regime can provide protective measures for owners of non-fungible tokens (NFTs).

The utilization of Non-Fungible Tokens (NFTs) to represent copyrighted works can yield advantages in terms of copyright protection. The concept of copyright bestows upon the proprietor the sole and exclusive privileges to replicate, disseminate, exhibit, and execute the intellectual creation. In the event of an infringement upon the copyrighted work linked to a NFT, the copyright holder possesses the prerogative to initiate legal proceedings in order to safeguard and uphold their rights.

The intellectual property rights (IPR) framework allows owners of non-fungible tokens (NFTs) to grant licenses for the use of their copyrighted works to third parties, thereby facilitating the generation of royalties. The individuals have the ability to establish the specific conditions in which others are permitted to utilize, exhibit, or trade the affiliated work. Furthermore, the implementation of smart contracts enables the automation of royalty disbursements to creators on every occasion that their non-fungible tokens (NFTs) are sold or exchanged.

In the event that a non-fungible token (NFT) embodies a brand or a logo that is protected by trademark, the intellectual property rights (IPR) framework can provide assistance in safeguarding the proprietor's entitlements from unauthorized utilization or violation. Trademark law provides owners with the legal authority to prohibit unauthorized usage of their registered trademarks by others.

The association between NFTs and patented technology or trade secrets may arise in specific instances. Patents confer exclusive legal privileges upon inventors, whereas trade

secrets safeguard confidential and proprietary knowledge. NFT proprietors have the option to employ these mechanisms of safeguarding intellectual property in cases where their digital assets incorporate patented technology or trade secret knowledge.

It is noteworthy to acknowledge that the implementation of the intellectual property rights (IPR) framework to non-fungible tokens (NFTs) is currently in a state of development. Concurrently, there are ongoing deliberations and disputes regarding the effective application of existing legal statutes and regulations within the digital domain. Non-fungible tokens (NFTs) pose distinct challenges and prospects within the realm of intellectual property, prompting legislators and legal frameworks to strive for adjustment in response to these nascent technologies.

In answer to the first research question, it can be stated that yes, intellectual property rights regime can provide safeguarding measures for owners of non-fungible tokens.

However, the existing measures in place to protect Intellectual Property Rights (IPR) within the domain of non-fungible tokens (NFTs) encounter considerable obstacles and are not entirely adequate. The shortcomings are attributed to several factors, including a heavy reliance on metadata that can be easily manipulated, challenges in effectively identifying instances of infringement and plagiarism, the decentralized nature of NFT platforms, legal uncertainties, a lack of transparency, and limited technological remedies. In order to enhance the protection of intellectual property rights (IPR), it is imperative to adopt a comprehensive strategy that encompasses technological advancements, industry standards, legal clarity, and collaborative efforts. Addressing these limitations necessitates the implementation of several key measures within the NFT community, including the establishment of explicit guidelines, the enforcement of authenticity verification, the enhancement of transparency, and the promotion of respect for intellectual property rights (IPR). Due to the unique attributes and intricate nature of non-fungible tokens (NFTs), it is imperative to establish a specialized legal framework. The comprehensive examination of the NFT ecosystem should encompass a range of facets, such as copyright ownership, authentication mechanisms, cross-border transactions, rights of publicity, privacy considerations, and safeguards for consumer protection. The

current situation necessitates the establishment of a *sui generis* legal framework to govern the ecosystem of non-fungible tokens (NFTs).

The advent of non-fungible tokens (NFTs) has the potential to significantly influence the economic rights of intellectual property rights (IPR) holders. The following are several crucial factors to consider:

NFTs offer intellectual property rights holders novel avenues for capitalizing on their intellectual assets. Through the process of tokenization, creators have the ability to directly offer their digital assets to collectors, fans, or investors by converting them into non-fungible tokens (NFTs) for sale or licensing purposes. This generates supplementary sources of income beyond conventional avenues such as physical sales, licensing, or royalties.

The utilization of Non-Fungible Tokens (NFTs) facilitates a direct artist-to-consumer model, allowing creators to engage directly with their audience while circumventing intermediaries such as galleries, agents, or publishers. The utilization of a direct artist-to-consumer model empowers artists to maintain a heightened level of authority over their creative works and potentially generate increased financial gains by circumventing the conventional distribution network.

Non-Fungible Tokens (NFTs) have the capability to integrate smart contracts, which can effectively enforce royalties for creators in both primary and secondary market sales. This implies that upon the resale of an NFT in a secondary market, a proportion of the transaction value can be automatically allocated to the initial creator. This phenomenon offers continuous income prospects for intellectual property rights holders, even after the primary transaction.

The digital nature of non-fungible tokens (NFTs) gives rise to apprehensions regarding the issues of counterfeiting and piracy. Intellectual property rights (IPR) holders must exercise constant vigilance in safeguarding their creative works against unauthorized reproduction or distribution. Although blockchain technology utilized in non-fungible tokens (NFTs) offers transparency and immutability, it does not completely eradicate the

potential for infringement. Consequently, intellectual property rights (IPR) holders may be required to investigate supplementary strategies to protect their rights.

The utilization of Non-Fungible Tokens (NFTs) has the potential to result in the fragmentation of ownership rights. Various non-fungible tokens (NFTs) have the capacity to symbolize distinct facets or components of an intellectual property, such as discrete chapters within a literary work or specific segments within an artistic creation. The process of fragmentation can potentially introduce complexities in licensing and enforcement, necessitating intellectual property rights (IPR) holders to diligently oversee and monitor the rights associated with each non-fungible token (NFT).

The advent of Non-Fungible Tokens (NFTs) presents a dynamic legal landscape that poses significant challenges to the current framework of intellectual property laws and regulations. With the increasing prevalence of NFTs, it is imperative for legal systems to undergo necessary adaptations in order to effectively tackle copyright concerns, licensing matters, royalty distribution, and other economic rights pertaining to these digital assets.

The full extent of the influence of non-fungible tokens (NFTs) on the economic rights of intellectual property rights (IPR) holders is currently being revealed. Although they present novel prospects for generating revenue and establishing direct connections with consumers, they also pose challenges and require meticulous examination of legal, licensing, and enforcement approaches.

In respect to the second research question, the research work has arrived upon such abovementioned inferences that suggest the possible impact of the emergence of non-fungible tokens (NFTs) on the economic rights of intellectual property rights (IPR) holders.

NFTs heavily rely on blockchain technology to verify information, prove ownership, and expedite transactions. The complex problems presented by digital assets and decentralized networks were not initially intended to be properly addressed by the existing intellectual property rules. Non-fungible tokens (NFTs) have intrinsic digital properties that must be accommodated, and a *sui generis* legal framework would include specific rules to ensure their legal validity.

The rapid growth of the non-fungible token (NFT) market has raised concerns regarding consumer protection, fraudulent practices, and investor rights. To address these concerns, implementing a comprehensive legal framework is crucial. This framework would enable regulatory oversight, ensuring transparency, fair practices, and adequate consumer protection. Issues such as anti-money laundering, taxation, and investor rights need to be addressed in relation to NFTs.

NFTs are a unique application of blockchain technology, and the digital platform landscape is constantly evolving. To accommodate future technological advancements and innovations in digital assets, a specialized legal framework is necessary. This framework would provide the flexibility and adaptability needed to ensure the legal system remains relevant and effective.

Given the distinctive characteristics and complexities of NFTs, a specialized legal framework is required. It should cover various aspects of the NFT ecosystem, including copyright ownership, authentication, cross-border transactions, rights of publicity, privacy concerns, and consumer protection. Establishing this specialized legal framework for NFTs would yield several benefits. It would foster innovation within the NFT sector, safeguard the rights of creators and consumers involved in NFT transactions, and facilitate the efficient operation and expansion of the NFT market.

In answer to the third research question, it can be stated that yes, the implementation of a *sui generis* law can effectively mitigate the issue of misappropriation and safeguard NFTs.

The legal principle of fair dealing, also referred to as fair use in certain jurisdictions, is a doctrine that permits the restricted utilization of copyrighted material without the need to acquire permission from the copyright holder. The aforementioned applications commonly encompass specific objectives, including but not limited to criticism, commentary, news reporting, teaching, research, and parody.

The applicability of the fair dealing defense in cases involving the appropriation of non-fungible tokens (NFTs) is contingent upon the circumstances and the legal framework of the jurisdiction in consideration. The determination of fair dealing/fair use is typically

made on an individual basis, considering various factors including the purpose and character of the use, the inherent characteristics of the copyrighted work, the quantity and significance of the portion utilized, and the impact on the potential market for the copyrighted work.

The determination of the impact of NFT appropriation relies on the specific characteristics and magnitude of the appropriation. If an appropriation entails the utilization of a copyrighted work in a manner that significantly alters its original form for the purposes of critique, commentary, or parody, there exists the potential to invoke the legal doctrine of fair dealing/fair use. Nevertheless, if the act of appropriation merely entails replicating or disseminating the copyrighted material without any substantial alteration or creative intent, it may present greater difficulties in effectively invoking the principles of fair dealing or fair use.

It is crucial to acknowledge that the utilization of fair dealing/fair use in relation to NFT appropriation is a dynamic field of jurisprudence. Due to the novelty of non-fungible tokens (NFTs), there exists a scarcity of legal precedents that directly pertain to this matter. Hence, the assessment of fair dealing/fair use in instances of NFT appropriation necessitates a meticulous examination of the circumstances and pertinent copyright legislation within the relevant legal jurisdiction.

Therefore, in an answer to the fourth and final research question which deals with the capability of NFTs to come under the concept of fair dealing, in the context of NFT appropriation, it would depend on the nature and extent of the appropriation. If the appropriation involves using a copyrighted work in a transformative manner for purposes such as criticism, commentary, or parody, there may be a possibility of invoking fair dealing/fair use.

However, if the appropriation simply involves reproducing or distributing the copyrighted work without any transformative purpose, it may be more challenging to successfully invoke fair dealing/fair use.

6.2 Suggestions

Some recommendations to tackle the legal problems associated with the impact of non-fungible tokens (NFTs) on the protection and management of intellectual property rights (IPR) are as follows:

It is imperative for NFT platforms and marketplaces to implement rigorous procedures for verification and authentication in order to guarantee the legitimacy and ownership of digital assets. Engage in a collaborative effort with professionals in the field of technology to devise robust digital watermarking, metadata, or blockchain-driven methodologies aimed at monitoring and validating the provenance and chronology of non-fungible tokens (NFTs).

Well-defined Copyright Guidelines and Licensing Mechanisms help in determining the subject matter of Non-fungible tokens and the extent of protection that needs to be provided. It is imperative to establish comprehensive guidelines and licensing frameworks that are tailored specifically to Non-Fungible Tokens (NFTs). These frameworks should effectively tackle concerns related to copyright ownership, usage rights, and the distribution of royalties. Advocate for the implementation of transparent and standardized licensing agreements pertaining to the utilization of copyrighted materials within the context of non-fungible tokens (NFTs), thereby guaranteeing equitable remuneration for creators and rights holders.

Emphasizing Security Enhancements is one of the ways to counter the malpractices associated with the use of NFTs. It is imperative for NFT platforms to give utmost importance to the implementation of sophisticated security measures in order to effectively deter counterfeiting, unauthorized minting, or distribution of NFTs. The application of blockchain technology, digital signatures, and encryption techniques can be employed to augment the security and integrity of non-fungible token (NFT) transactions and the storage of digital assets.

The promotion of international cooperation and harmonization is essential in fostering consistent legal frameworks and standards for Non-Fungible Tokens (NFTs). This necessitates collaborative efforts among governments, regulatory bodies, and industry

stakeholders. Promote collaborative efforts aimed at addressing jurisdictional complexities and devising frameworks for the effective enforcement of intellectual property rights pertaining to non-fungible tokens (NFTs) across international borders.

It is imperative for NFT platforms to comply with pertinent data protection regulations and establish privacy measures in order to bolster privacy and safeguard user information and transactional data. Ensure that user consent is obtained and that the purposes and scope of data collection and processing related to non-fungible token (NFT) transactions are effectively communicated.

Enhancement of Public Awareness and Education is of utmost importance to address the issues pertaining to NFTs and IPR. Facilitate the augmentation of public awareness and education pertaining to Non-Fungible Tokens (NFTs), intellectual property rights, and the associated legal ramifications. Promote constructive discourse among creators, collectors, platforms, and legal professionals in order to establish a collective comprehension of the obstacles and optimal methodologies within the non-fungible token (NFT) ecosystem.

It is advisable for NFT platforms and marketplaces to establish partnerships with legal and intellectual property (IP) experts in order to effectively address the intricate matters concerning copyright, licencing, and intellectual property associated with NFTs. Participate in continuous dialogues and iterative feedback processes to modify and enhance policies and practices in response to legal advancements and emerging exemplars.

The Adoption of a *Sui generis* Legal Framework for Non-Fungible Tokens (NFTs) as discussed above provides us with novel solutions to the complications that arise within the ecosystem of non0fungible tokens. Deliberate the adoption of a *sui generis* legal framework that is specifically tailored to tackle the distinctive challenges and legal complexities inherent in the realm of NFTs. Propose the formulation of an all-encompassing legal framework that addresses various dimensions including ownership, verification of authenticity, licensing, royalties, and mechanisms for enforcing rights pertaining to non-fungible tokens (NFTs). Engage in collaborative efforts with legal professionals, industry participants, and regulatory entities in order to develop and

enhance the *sui generis* legislation, with a focus on achieving a harmonious equilibrium between the interests of creators, collectors, and intellectual property rights holders. The *sui generis* legislation ought to establish unambiguous directives to safeguard non-fungible tokens (NFTs), encompassing concerns such as copyright violation, counterfeiting, and misappropriation. In order to effectively tackle jurisdictional challenges within the international NFT marketplace, it is imperative to incorporate provisions pertaining to dispute resolution, enforcement measures, and cross-border cooperation. It is imperative to maintain a constant vigilance and assessment of the efficacy of the *sui generis* law, while making appropriate adjustments to ensure its alignment with the rapid progress of technology and the emergence of novel legal concerns. The implementation of a *sui generis* law customised specifically for non-fungible tokens (NFTs) can offer a specialised legal structure aimed at addressing the legal challenges arising from the influence of NFTs on the safeguarding and administration of intellectual property rights. The utilisation of this framework presents a valuable prospect for the establishment of explicit entitlements, responsibilities, and mechanisms for enforcing compliance within the dynamic realm of non-fungible tokens (NFTs), thereby guaranteeing sufficient safeguarding for all parties engaged in the process.

The primary objective of these recommendations is to achieve a harmonious equilibrium between safeguarding intellectual property rights and cultivating innovation within the realm of non-fungible tokens (NFTs).

The involvement of diverse stakeholders and ongoing monitoring of the legal landscape are essential for effectively adapting to the ever-changing technologies and market dynamics.

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