

ANALYSIS OF MEDIA DISCOURSE ON INTELLECTUAL PROPERTY RIGHTS RELATED TO METAVERSE IN KOREA

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ABSTRACT

This study examines the evolving discourse on intellectual property rights (IPR) within the metaverse's Korean context, facilitated by the BIGKinds analytics program. As the metaverse transitions from a nascent concept to a complex reality, it reshapes digital interactions and poses new challenges for IPR, necessitating a comprehensive investigation into societal interest and legal discourse. The findings reveal a significant surge in metaverse-related IPR engagement over the past three years, aligning with the broader digital shift amid the COVID-19 pandemic. This pattern suggests an increasing need for nuanced legal approaches to copyright, trademark, and design patent protection in virtual environments. Thus, the urgency for legal reform to accommodate the metaverse's unique characteristics, the necessity for international collaboration on IPR in a borderless digital domain, and the intersection of technological advances, like NFTs and blockchain, with legal frameworks impacting creators' rights. As a result, this study provides policymakers and the digital community with real-time guidance on protecting intellectual property amid the transformative growth of the metaverse.

KEYWORDS

Metaverse, Intellectual property rights, BIGKinds, Discourse

1. INTRODUCTION

The integration of the real and virtual worlds through metaverse platforms has brought about revolutionary changes in interaction with digital content. The term "metaverse," originating from Neal Stephenson's 1992 science fiction novel "Snow Crash," describes a deeply immersive virtual reality environment [1]. This digital universe is powered by the latest advancements in 5G connectivity, 3D graphics, and virtual/augmented reality technologies. Today's metaverse far exceeds its initial concept, which depicted users as passive recipients of digital experiences [2]. Users can now not only immerse themselves in virtual environments, but also actively contribute to content production, dissemination, and monetization [3]. Users migrate from simply consumers to "prosumers"—a hybrid of producers and consumers—who engage creatively and economically on these platforms [4]. This significant shift in digital engagement demonstrates how intellectual property rights (IPR) are being reimagined in this new digital environment [5]. Users in the metaverse's open environment can readily develop and distribute a wide range of digital products, challenging the traditional boundaries and enforcement methods of intellectual property law [6]. In the metaverse, users can design and sell everything from avatar clothing to

complete virtual landscapes, raising significant legal issues related to copyright, trademark, and design patent ownership, rights enforcement, and the scope of copyright protection. This occurs in a space that blurs the boundaries between digital and physical [7]. Furthermore, the metaverse's global and networked nature challenges legal jurisdictions. IPRs, which have generally been administered by national governments, present significant issues in this global digital era. For instance, a virtual object created in one country can be replicated and used in many other countries without clear legal remedies [8]. This situation underscores the urgent need for international cooperation and harmonization of intellectual property laws to address the unique challenges posed by the metaverse. Vig [6] explored the impact of the metaverse in the context of the Fourth Industrial Revolution, particularly focusing on IPRs from an Indian perspective, discussing how the merging of virtual and physical lives in the metaverse introduces new opportunities and challenges for users, owners, and regulators regarding the protection and enforcement of IPRs. However, there have been very few studies examining the discourse on IPRs within the context of the metaverse in a Korean setting. To examine societal interest in Metaverse IPRs, this study utilized BIGKinds, a program that analyzes news article data using big data [9]. BIGKinds is a big data analysis system for news from the Korea Press Foundation, where media reports can be classified and analyzed according to keywords [10], which has accumulated over 82 million articles provided by 104 major newspapers, broadcasters, and specialized magazines in Korea since 1990 [11]. This study utilized the BIGKinds program to investigate the extent of interest in and discourse surrounding IPRs in the metaverse within the context of Korean society, assessing the potential IPRs likely to emerge with the increasing prevalence of the metaverse.

2. LITERATURE REVIEW

This study examines the literature on the metaverse and IPRs implemented in the digital world.

2.1. Metaverse

At its core, the metaverse is envisioned as a collective shared virtual space, created by the convergence of virtually enhanced physical reality and physically persistent virtual space, including the sum of all virtual worlds, augmented reality, and the internet [12]. The term "metaverse" is gaining prominence due to the concerted efforts of multinational technology conglomerates and a recent surge of interest in Web 3.0, Blockchain, and NFTs [13]. The concept of the metaverse is not new. It has evolved from simple 2D interfaces to complex 3D virtual environments, representing the culmination of advances in various fields, including virtual reality (VR), augmented reality (AR), blockchain, and artificial intelligence (AI) [14]. The metaverse, from a functional perspective, presents a diverse array of applications, spanning across multiple domains. Initially rooted in entertainment and gaming, its scope has expanded significantly, encompassing realms such as education, e-commerce, and remote work [15]. In the realm of entertainment and gaming, the metaverse serves as a boundless playground where users can immerse themselves in rich, interactive experiences, exploring virtual worlds, engaging in multiplayer games, and forging social connections in ways previously unimaginable [16]. In education, the metaverse has emerged as a powerful tool for immersive learning experiences, offering interactive simulations, virtual classrooms, and collaborative environments that transcend the limitations of traditional education models [17]. Moreover, in the realm of e-commerce, the metaverse can provide innovative opportunities for businesses to create virtual storefronts, immersive shopping experiences, and virtual marketplaces, revolutionizing the way consumers engage with brands and products [18]. Within the metaverse, even the live concert experience has been redefined, blending immersive audiovisual elements to create virtual spectacles that transcend physical boundaries, uniting global audiences in shared digital spaces

[19]. Lastly, in the context of remote work, the metaverse offers a compelling alternative to traditional office environments, enabling distributed teams to collaborate seamlessly in virtual workspaces, conduct meetings, and share ideas in immersive, interactive settings [20]. The current development phase of the metaverse can be seen as nascent yet rapidly evolving. Blockchain technology plays a crucial role in this aspect, offering a decentralized approach to ownership and transaction management in the metaverse. NFTs (Non-Fungible Tokens), for instance, are used to authenticate unique digital assets, empowering users with true ownership of their virtual possessions [21]. However, there are challenges that must be overcome for the metaverse to become active. One significant hurdle is achieving seamless integration and interoperability between different virtual environments. The goal is to allow users to move freely across various platforms with their digital assets and identities intact [22]. Another issue is scalability. As user numbers grow, platforms need to handle the increased data and interactions without compromising performance. In addition, the infrastructure required to support such a complex network is immense. High-speed internet connections, powerful computing hardware, and sophisticated software are prerequisites for the metaverse to function optimally. The introduction of 5G networks will significantly enhance the connectivity and responsiveness of virtual environments, making them more accessible and enjoyable. The ongoing development of VR and AR headsets, along with haptic feedback devices, will continue to push the boundaries of immersion [23]. There are also concerns regarding privacy and security. As users spend more time and money in virtual spaces, protecting their data and transactions becomes paramount [24]. Therefore, the metaverse is likely to see exponential growth as these challenges are addressed and as technology continues to advance. The growth of the metaverse may raise intellectual property issues, necessitating a review. Below, an examination of intellectual property within a Korean context is conducted.

2.2. Intellectual Property Rights

IPRs have been a cornerstone of the modern creative and innovation landscapes, balancing the creators' rights to benefit from their works with the public's interest in accessing knowledge and furthering societal progress [25]. The discourse around IPRs is multifaceted and complex, navigating between legal frameworks, ethical considerations, and economic impacts. In South Korea, IPRs provide a critical legal framework that grants creators legal rights, ensuring their intellectual efforts are properly protected and that they can derive economic benefit [26]. These rights manifest in various forms, such as patents, trademarks, and copyrights, each with distinct characteristics in terms of registration procedures, duration of protection, and scope of rights [27]. The protection of IPR for online content, in particular, has become increasingly vital with the evolution of the digital age. Due to the ease of duplication and distribution of online content, the role of copyright law in safeguarding the rights of the original creators is emphasized. This is crucial in an environment where various forms of content, including webtoons, music, and videos, can be easily shared over the internet, necessitating the preservation of creators' rights and the authenticity of content [28]. The IPR of online content holds several significant differences from that of traditional media. Firstly, digital content is an intangible asset that can be instantly transmitted anywhere globally via the internet, complicating international copyright protection. Secondly, the high reproducibility of online content makes it challenging to prevent unauthorized duplication and distribution once it is disseminated over the internet, increasing the risk of copyright infringement and thus the need for effective technical protection measures. Thirdly, online content is easily modifiable and can be recreated into new works by users, presenting new challenges in defining the 'fair use' scope under copyright law. South Korea's IPR system continues to evolve in response to these changes in the online environment [29]. For example, the Korea Copyright Commission operates various programs and policies to resolve copyright infringement issues and protect the rights of copyright holders [30]. Moreover, by participating in international copyright conventions, Korea has integrated into an international copyright

protection system, laying the foundation for Korean creators to have their rights recognized worldwide.

Table 1 presents the classification of IPRs in Korea. Thus, IPRs are categorized into Industrial Property Rights and Copyrights. Industrial Property Rights encompass patents, utility model rights, design rights, and trademarks. Patents safeguard original or core technological innovations and have a duration of 20 years, while utility model rights protect peripheral or improved technologies for 10 years. Design rights pertain to the protection of object designs, with a validity period of 15 years, and trademarks defend identifiable symbols, characters, or shapes, renewable every 10 years, initially valid for the same duration. On the other hand, copyrights cover creative works in literature, art, and related domains, retaining validity for 70 years following the author's demise. This classification delineates the diverse forms of intellectual property protection available in Korea, tailored to specific aspects of innovation and creativity, each governed by distinct durations of existence [31].

Table 1. The Classification of Intellectual Property Rights in Korea

Category		Protected areas	Duration of existence
Industrial Property Rights	Patents	Original or core technology	20 years
	Utility model rights	Peripheral or improved technology	10 years
	Design rights	Design of an object	15 years
	Trademarks	Identifiable symbols, characters, or shapes	10 years (can be renewed every 10 years)
Copyrights		Creative works in literature, art, etc.	Valid for 70 years after the author's death

3. METHODOLOGY

3.1. BIGKinds

This study utilized the BIGKinds service provided by the Korea Press Foundation, a big data analysis program for news that leverages data mining technology to present results [10]. The BIGKinds platform utilizes news text data from 104 Korean press agencies to offer various analytical functions. Users can perform keyword trend analysis, relationship analysis, detailed filtering, and natural language processing through BIGKinds, enabling research and comprehensive understanding of news content. Additionally, BIGKinds provides clustering of similar news articles and enables keyword analysis using specific algorithms. BIGKinds offers a powerful tool for visualizing and analyzing news data without the need for users to learn programming languages. The program provides users with a list of related news articles, keyword trends, and associated word analysis [32].

3.2. Data Collection and Analysis

This study employed the BIGKinds program, provided by the Korea Press Foundation [9], to gather data concerning the societal perception of metaverse IPRs in Korea. Data collection was conducted by querying the BIGKinds database using the search term "Metaverse IPRs (in Korean)" spanning from January 1, 2014, to December 31, 2023, encompassing a ten-year period. Subsequently, the collected data underwent comprehensive frequency analysis to identify prevalent themes and trends. Additionally, weighted associated terms related to the search query

were examined to gain deeper insights into the discourse surrounding metaverse IPRs over the past decade.

4. RESULTS

4.1. Analysis of Frequencies and Trends

Over the course of the past decade (2014-2023), a comprehensive analysis utilizing the BIGKinds program revealed a total of 189 occurrences of the search term "Metaverse IPRs." Figure 1, depicted below, visually represents the frequency trend of searches related to "Metaverse IPRs" during this period. Before the year 2020, instances of searches for the keyword "Metaverse IPRs" were relatively scarce. However, an intriguing shift occurred in 2021, as the search volume surged to 44, followed by a notable increase to 80 in 2022. Subsequently, the search volume exhibited a discernible decline, reaching a modest count of 20 in 2023. Notably, this fluctuation in search activity closely mirrors the timeline of the COVID-19 pandemic, suggesting a potential correlation between the two phenomena.

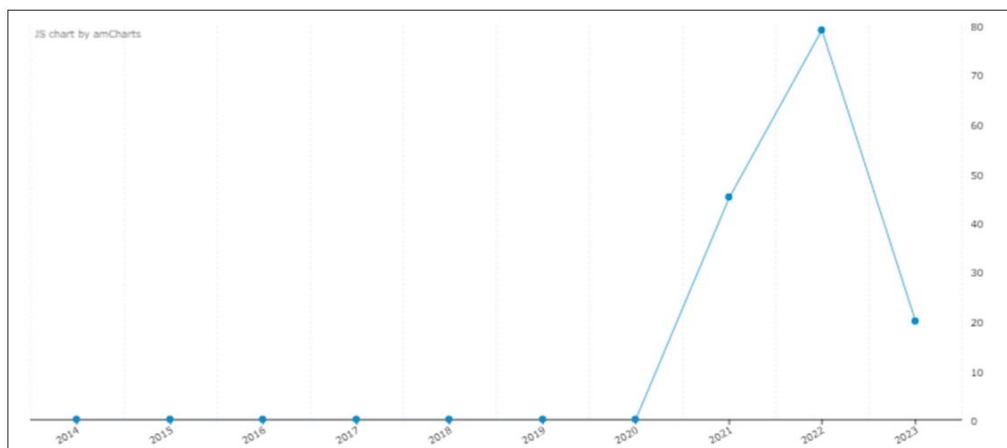


Figure 1. Trends in the Frequency of "Metaverse IPRs" Over 10 Years

4.2. Analysis of Related Words

Within the context of exploring "Metaverse IPRs," Table 2 provides an insightful breakdown of the top 5 weighted keywords extracted from the extensive corpus of news articles analyzed through the BIGKinds program. These keywords are pivotal in elucidating the nuanced facets of discourse surrounding IPRs within the metaverse ecosystem. At the forefront of this analysis is the keyword "NFT," which holds a significant weight of 29.83, indicating its prominence in discussions on metaverse IPRs. This keyword appeared a notable 337 times within the articles analyzed, underscoring its relevance and ubiquity within the discourse. "NFT" stands for non-fungible token, a digital asset that represents ownership or proof of authenticity of a unique item or piece of content, often tied to artwork, collectibles, or virtual real estate within the metaverse. Following closely behind is "Blockchain," with a weight of 10.28 and 140 instances. The inclusion of "Blockchain" reflects the growing recognition of blockchain technology as a foundational framework for establishing and safeguarding IPRs within virtual environments. The inherent transparency and immutability of blockchain systems offer promising solutions for ensuring the authenticity and traceability of digital assets in the metaverse. Another noteworthy keyword is "Avatar," with a weight of 8.28 and 96 instances. The prevalence of "Avatar" underscores the significance of personalized digital representations within virtual worlds, raising

pertinent questions regarding the ownership and control of avatar likenesses and identities in the context of IPRs. Further down the list, "Architectural Drawings" emerges as a key keyword, ranking fourth with a weight of 6.16 and 11 instances. This highlights the importance of architectural designs and blueprints within virtual environments, emphasizing the need for legal frameworks to protect the IPRs of creators and architects operating within the metaverse. Rounding off the top 5 is "Virtual world," with a weight of 6 and 35 instances. This keyword encapsulates the overarching concept of virtual spaces and environments within the metaverse, serving as the backdrop for various creative endeavors and commercial activities. Discussions surrounding IPRs within the metaverse invariably intersect with considerations of ownership, governance, and regulation within these expansive virtual realms. As a result, the weighted keywords outlined in Table 2 offer valuable insights into the multifaceted landscape of metaverse IPRs, highlighting key themes, technologies, and challenges that warrant further exploration and deliberation within legal, technological, and societal domains.

Table 2. Search Ranking of Weighted Keywords

Rank	Keywords	Weight	Frequency
1	NFT	29.83	337
2	Blockchain	10.28	140
3	Avatar	8.28	96
4	Architectural drawings	6.16	11
5	Virtual world	6	35

4.3. Discourse on Metaverse IPR

In the ever-expanding landscape of the metaverse, IPRs have emerged as a critical discourse. As digital realms intertwine with our physical existence, the ownership, creation, and distribution of assets within this virtual space raise complex questions [6]. Leveraging insights from the BIGKinds program, this discourse delves into the multifaceted nature of metaverse IPRs, exploring the intersection of NFTs, Blockchain technology, Avatars, Architectural Drawings, and Virtual Worlds in this study. NFTs have revolutionized the concept of ownership in the metaverse [33]. These unique digital assets, secured by blockchain technology, enable creators to tokenize their works, asserting ownership and authenticity. However, the proliferation of NFTs has sparked debates over copyright infringement and fair use, underscoring the need for robust legal frameworks to safeguard creators' rights while fostering innovation. Blockchain technology, the underlying technology powering NFTs, plays a pivotal role in establishing trust and transparency in the metaverse [34]. By decentralizing data storage and verification, blockchain technology ensures immutable records of ownership, mitigating disputes and promoting accountability. Yet, the decentralized nature of blockchain technology also challenges traditional notions of authority, prompting discussions on governance models and jurisdictional issues within the metaverse. Avatars serve as digital embodiments of users in virtual environments, blurring the lines between identity and expression. As individuals invest time and resources in customizing their avatars, questions arise regarding the ownership of avatar likenesses and the rights to profit from their usage. Moreover, the emergence of deepfake technology amplifies concerns surrounding identity theft and privacy, necessitating ethical guidelines to protect users' digital personas [35]. Architectural drawings within the metaverse encompass virtual landscapes and environments, ranging from futuristic cityscapes to historical landmarks. While these digital representations offer boundless creative possibilities, conflicts may arise when virtual constructions mimic real-world structures or incorporate copyrighted elements. Balancing artistic freedom with IPRs is paramount in ensuring a harmonious coexistence between the virtual and physical realms. Virtual worlds serve as immersive platforms where users interact, collaborate, and create within shared digital spaces [36]. Within these expansive landscapes, the delineation

of intellectual property boundaries becomes increasingly nuanced. From user-generated content to branded experiences, the metaverse fosters a dynamic ecosystem of cultural exchange and innovation. However, the commercialization of virtual assets and the replication of real-world businesses raise concerns about monopolistic practices and economic disparities. In navigating the complexities of metaverse IPRs, collaboration between stakeholders is imperative [6]. From content creators to platform developers, policymakers to legal experts, a multifaceted approach is needed to address the evolving challenges and opportunities within the metaverse.

4.4. Discussion

The Agenda-Setting Theory (AST) posits that media's selection and highlighting of certain topics influence public perception of importance, shaping societal agendas. Analyzing media articles through this lens helps decipher not only what issues are being emphasized but also why, uncovering the underlying motives and biases of media outlets. By examining which topics receive prominence and how they're framed, one gains insights into the media's role in shaping public discourse, political agendas, and social norms [37]. Based on the AST, this study conducted a comprehensive analysis of the discourse surrounding metaverse IPRs using data collected from the BIGKinds program. This platform facilitated the examination of news articles over a decade, providing insights into the frequency, trends, and weighted keywords associated with the topic. The findings shed light on the evolving landscape of IPRs within the metaverse, highlighting key concepts such as Non-Fungible Tokens (NFTs), Blockchain technology, Avatars, Architectural Drawings, and Virtual Worlds. The results indicated a significant increase in the discussion of "Metaverse IPRs" from 2020 to 2022, coinciding with the emergence and spread of the COVID-19 pandemic. This observation suggests a possible correlation between global events and shifts in digital discourse, emphasizing the interconnectedness between virtual and physical realms. One of the central themes identified in the discourse is the role of NFTs in redefining ownership within the metaverse. These unique digital assets, enabled by blockchain technology, offer creators a means to assert ownership and authenticity over their works. However, the proliferation of NFTs has sparked debates surrounding copyright infringement and fair use, underscoring the importance of establishing robust legal frameworks to protect creators' rights while fostering innovation [4, 5]. Blockchain technology, which underpins NFTs, plays a pivotal role in ensuring transparency and trust within the metaverse. By decentralizing data storage and verification, blockchain technology provides immutable records of ownership, thereby mitigating disputes and promoting accountability [3]. However, the decentralized nature of blockchain technology also poses challenges to traditional notions of authority, prompting discussions on governance models and jurisdictional issues within the metaverse [6]. Avatars, as digital representations of users in virtual environments, raise questions regarding ownership rights and identity protection. As individuals invest time and resources customizing their avatars, concerns arise regarding the commercial use of avatar likenesses and the potential for identity theft through deepfake technology [7]. Furthermore, ethical guidelines are needed to safeguard users' digital personas and ensure privacy in the metaverse [12, 24]. Architectural drawings within the metaverse offer boundless creative possibilities but may also present challenges related to IPRs. Conflicts may arise when virtual constructions mimic real-world structures or incorporate copyrighted elements, highlighting the need to balance artistic freedom with legal considerations [12]. Virtual worlds serve as immersive platforms for interaction and collaboration, blurring the boundaries between physical and digital spaces. However, the commercialization of virtual assets and the replication of real-world businesses raise concerns about monopolistic practices and economic disparities [18]. Collaboration among stakeholders is critical to address these challenges and foster a metaverse that upholds principles of creativity, inclusivity, and sustainability [14]. As a consequence, the analysis of metaverse IPRs reveals the intricate interplay between technology, law, and society within virtual environments. By examining trends and discourse using the BIGKinds platform, this study provides valuable insights into the

evolving landscape of IPR in the metaverse, highlighting key issues and opportunities for future research and policy development.

The methodology employed in this study relied on the BIGKinds service provided by the Korea Press Foundation for data analysis, which introduced certain limitations. Firstly, despite its extensive coverage of news text data from 104 Korean press agencies, BIGKinds may not encompass all relevant sources or perspectives on metaverse IPRs, potentially leading to a biased representation of discourse. Additionally, the reliance on news articles for data collection may introduce inherent biases associated with media coverage, such as sensationalism or editorial agendas, which could skew the analysis results. Moreover, the search query "Metaverse IPRs" may overlook alternative terminology or emerging concepts related to intellectual property within virtual environments, limiting the comprehensiveness of the study. Furthermore, the timeframe of data collection from January 1, 2014, to December 31, 2023, may not capture recent developments or shifts in discourse surrounding metaverse IPRs, potentially resulting in outdated conclusions. Lastly, while the frequency analysis and examination of weighted keywords offer valuable insights into prevalent themes and trends, they may oversimplify the complex nuances of discourse surrounding metaverse IPRs, overlooking subtler dynamics or minority viewpoints. Therefore, future research endeavors should consider supplementing BIGKinds data with diverse sources and methodologies to provide a more holistic understanding of metaverse IPRs and address the aforementioned limitations.

5. CONCLUSIONS

This study deployed the BIGKinds analytics program to explore the discourse surrounding metaverse IPRs within Korean society. The research revealed a heightened interest in IPR related to the metaverse, particularly during the last three years, which coincides with the accelerated transition to digital platforms during the COVID-19 pandemic. The metaverse's potential for growth and innovation is boundless, yet it brings forth complex challenges that demand a nuanced approach to copyright, trademark, and design patent enforcement and protection. Our findings suggest an urgent need for the evolution of legal frameworks to address the unique dynamics of the metaverse, which includes reassessing copyright definitions to accommodate virtual creations and examining traditional IPR enforcement in an increasingly decentralized digital environment. Also, the global nature of the metaverse necessitates international legal cooperation to provide uniform and efficient protection of IPRs across various jurisdictions. Furthermore, with the rise of NFTs and blockchain technology, there's a significant intersection between technology and law. The implications for creators' rights and the enforcement of IPRs are profound, requiring legal systems to adapt to technological advancements. The limitations of this study include its reliance on BIGKinds, which restricts insights to Korea, the potential lag in addressing rapid technological changes, and the limited consideration of diverse cultural perspectives on metaverse IPRs across societies. Future research should expand the scope beyond Korean society to incorporate a broader international perspective, recognizing the metaverse's global reach. It should also investigate the implications of emerging technologies, such as AI and quantum computing, on IPR within the metaverse. Additionally, interdisciplinary approaches combining legal studies with technological innovation could offer richer insights. Finally, there's a need for longitudinal studies that can keep pace with rapid developments in the field, providing real-time analyses to inform both policymakers and the digital content community on best practices for safeguarding intellectual property in the evolving landscape of the metaverse.

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