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innovation and impact in the digital age.



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**The Future of Intellectual Property in the Digital Age:
Navigating Innovation and Challenges
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FOREWORD

In every age of technological progress, the law is called upon to adapt. The digital era, with its rapid pace and global reach, presents some of the most far-reaching challenges yet. As methods of creating and sharing knowledge evolve, so too must the legal frameworks that guide the protection, management, and fair use of intellectual property.

The *Journal of IP Professionals (JIPPS)* makes a timely contribution. It creates space for serious discussion on how intellectual property can better respond to local realities while remaining attuned to global developments. Its focus on innovation, equity, and practical impact is well-placed.

What is notable is the journal's effort to move the conversation beyond borrowed models, to approaches grounded in real contexts. It brings together voices across sectors and disciplines, something our field sorely needs.

Today, the legal profession stands before complex and often competing demands. On one hand, there is an evident need to update our IP systems in response to technologies such as artificial intelligence, blockchain, and digital content platforms. On the other, we must confront persistent gaps in access to IP protection, especially for creators and businesses in underserved regions. The digital economy has unlocked new possibilities, but it has also widened pre-existing inequalities. For IP law to serve the public interest, it must engage these tensions with seriousness and clarity.

This inaugural issue of *JIPPS* meets that challenge with rigor. It brings together perspectives from practice, policy, and academia, offering a forum where difficult questions are welcomed rather than avoided. In doing so, it fosters the kind of sustained inquiry that is vital to keeping IP law both responsive and responsible.

I am especially pleased by the journal's forward-looking orientation. The future of IP will not be shaped by doctrine alone, but by those who can navigate across disciplines and appreciate the social and economic implications of legal choices. Intellectual property is not just a technical field; it plays a central role in how societies structure opportunity and reward creativity.

JIPPS is therefore more than a scholarly publication. It is a forum for leadership. A place where emerging voices can contribute to shaping the direction of IP law and policy in Africa and beyond.

At a time when inclusive, critical, and grounded thinking is urgently needed in IP discourse, *JIPPS* sets a strong foundation. I welcome its debut with optimism and commend it to all who are committed to the future of intellectual property as a vehicle for development, justice, and innovation.

Professor Bankole Sodipo, SAN





Editorial

Journal of IP Professionals (JIPPS), Volume 1, 2025

Theme: The Future of Intellectual Property in the Digital Age: Navigating Innovation and Challenges

The *Journal of IP Professionals (JIPPS)* proudly presents its inaugural edition, launched to serve as a dynamic forum for critical discourse, interdisciplinary research, and professional insights on the evolving landscape of intellectual property (IP). This first edition, centered on the theme “*The Future of Intellectual Property in the Digital Age: Navigating Innovation and Challenges*,” emerges at a pivotal moment in the global conversation about how IP systems must adapt to digital disruption, technological innovation, and new socio-economic realities.

As emerging technologies continue to redefine the boundaries of creation, ownership, and enforcement, IP frameworks are being tested in unprecedented ways. The articles in this volume examine how stakeholders across sectors, including innovators, regulators, practitioners, and communities, can collectively shape the future of IP to ensure it remains relevant, inclusive, and innovation-driven.

The topics covered are diverse yet thematically unified. They include:

- **Trademarks in the Metaverse**, which explores brand protection in virtual and augmented reality spaces.
- **Data Ownership and IP Rights**, examining the intersection of personal data, innovation, and IP regulation.
- **The Future of IP Law Practice**, discussing how professionals must evolve in response to changing business and technological environments.
- **IP Enforcement in the Age of Digital Piracy and Counterfeiting**, addressing modern challenges in rights enforcement.
- **Artificial Intelligence and Copyright**, tackling the critical issue of authorship in AI-generated content.

- **Enhancing Access to IP in the Digital Era**, emphasizing the role of IP in advancing sustainable development.
- **The Role of Intellectual Property in Startup Growth**, offering practical strategies for entrepreneurs seeking to leverage IP for scalability.
- **NFTs and IP Ownership**, highlighting the evidentiary value of blockchain in proving authorship and rights.
- **Supporting Underrepresented Entrepreneurs through IP Frameworks**, which calls for inclusive policies that close access gaps.

These contributions reflect the journal's commitment to publishing content that is both forward-looking and grounded in real-world challenges. The editorial team curated this edition to spark dialogue and inspire innovation at the intersection of intellectual property, technology, and business.

The *Journal of IP Professionals (JIPPS)* was established to serve a dual purpose: to advance intellectual property thought leadership and to create space for diverse and emerging voices within the global IP community. It aims to be a trusted resource for policymakers, scholars, practitioners, and businesses seeking to navigate the complexities of IP in the digital economy.

The editorial board expresses its deep appreciation to all contributing authors, reviewers, and supporters whose efforts made this edition possible. This first volume marks the beginning of what promises to be an impactful journey toward shaping the future of IP thought and practice.

Looking ahead, future editions of *JIPPS* will continue to engage with the dynamic and evolving landscape of intellectual property. The journal remains committed to publishing timely, thought-provoking content that bridges the gap between academic inquiry and practical application. We welcome contributions from diverse voices that challenge assumptions, offer new perspectives, and help shape the future of IP across borders and disciplines.

Daphne Ekpe

Founding Editor

Journal of IP Professionals (JIPPS)



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Trademarks in the Metaverse: Protecting Brands in Virtual and Augmented Reality

Tolu Olaloye

Partner, Jackson, Etti & Edu

Abstract

The emergence of the Metaverse has revolutionized the way people interact, transact, and consume goods and services. As commerce migrates into virtual spaces, traditional notions of trademark protection are being challenged and redefined. This article explores the evolving landscape of trademark law in the Metaverse, highlighting the growing relevance of brand protection in virtual environments. It begins by unpacking the fundamentals of trademark law and its importance in distinguishing goods and services, even in a digital economy. The article then examines key challenges facing trademark protection in the Metaverse, including the conflict between the territorial nature of trademark rights and the borderless nature of virtual spaces, the inconsistent classification standards that exist for digital goods across different jurisdictions, and the difficulty of enforcing rights in virtual environments. Against this backdrop, the article offers practical steps for brand owners to proactively safeguard their trademarks, such as expanding trademark filings to cover virtual goods, monitoring virtual platforms for infringement, collaborating with Metaverse operators, updating IP agreements to cover digital uses, and engaging tech-savvy legal counsel. The article concludes by advocating for legal reforms and institutional capacity-building, particularly in jurisdictions like Nigeria, to ensure that intellectual property (IP) law keeps pace with the rapidly changing digital economy.

Keywords: Metaverse, trademark protection, virtual goods, NFTs, brand enforcement, intellectual property, Nice Classification, digital assets, infringement, Nigeria.

Introduction

The Metaverse is one of the more intriguing innovations of the digital age. It is innately fascinating. Tucci and Moore (2024) describe it as the convergence of physical and virtual space, accessed through computers and enabled by immersive technologies such as virtual reality (VR),

augmented reality (AR), and mixed reality. It is essentially a space that merges physical and digital reality, allowing users to interact as customisable avatars (Ortiz, 2024).

Powered by technologies like blockchain, VR/AR, and artificial intelligence (AI), the Metaverse hosts a network of immersive, 3D virtual worlds where users interact with one another, digital objects, and their environment through avatars. Although most people typically come to have primary contact with the Metaverse through gaming, its applications extend far beyond that and cut across diverse sectors, including education, commerce, architecture, real estate, and healthcare (Gupta, 2023). The immense potential of the Metaverse to replicate and support everyday real-world activities is what underscores the increasing relevance of discourse on brand protection within this artificial world.

The Metaverse has become a real and thriving commercial space. On three-dimensional virtual world platforms, like *Decentraland*, users can buy, own, and sell virtual plots of land as Non-Fungible Tokens (NFTs) (Holmes, 2021). They can buy clothes and other accessories, get their nails done, pay for and listen to music (Miranda, 2022), all of which are goods and services provided by various businesses and brands.

In the physical world, trademarks work to distinguish goods and services, build consumer trust, protect goodwill, and help businesses maintain a competitive edge (Koglin et al., 2017). These functions remain vital in the Metaverse, where brands are now selling virtual goods (e.g., Nike's virtual sneakers), offering branded experiences like virtual concerts and immersive stores, and interacting directly with consumers through avatars and AI interfaces. This convergence of commerce and creativity takes conventional trademark law into new terrain, filled with exciting possibilities, yet complex challenges (Bitton & Haas, 2023).

It is, therefore, crucial for relevant stakeholders, especially the brands, to understand how to navigate trademark protection and enforcement in the Metaverse, in order to effectively combat counterfeiters and unauthorized users seeking to misappropriate trademarks, cause confusion amongst consumers, erode goodwill, and dilute brand value, even in the context of virtual goods and services.

Trademark Protection: Understanding the Fundamentals

A trademark is a sign, symbol, word, phrase, design, or a combination thereof that identifies and distinguishes the goods or services of one business from those of others (Trademarks Act, 1967, s. 67(1)). Trademarks are not the only aspect of a brand's identity, but they are a key part of it (Koglin et al., 2017). When we see the Nike "swoosh" on a shoe, Apple's apple logo on a phone, or the word "Coca-Cola" on a beverage, we do not only recognize the origin of the product, but we also associate it with a certain standard of quality, built over time through reputation and goodwill.

Trademarks may take different forms. They could be words (*e.g.*, Google), logos (*e.g.*, Pepsi's circle emblem), slogans (*e.g.*, "Just Do It" by Nike), and in some jurisdictions, shapes, sounds, and even colours (Bleeker & Koplow, 2019). These marks are valuable business assets that can appreciate over time and serve as collateral, generate licensing revenue, and form a major part of a company's IP portfolio (Hall, 2025; Barrett, 2023).

Registering a trademark gives the proprietor exclusive rights to use the mark in connection with the specified goods or services in respect of which the mark is registered (Trade Marks Act, 1967, s. 5). This means that upon registration, the proprietor has the right to prevent others from using marks that are identical or confusingly similar marks; sue for trademark infringement and obtain remedies such as injunctions, damages, or account of profits (Trade Marks Act, 1967, s. 3); license the trademark to others for commercial use (Trade Marks Act, 1967, s. 33); and sell or assign the trademark (Trade Marks Act, 1967, s. 26).

Depending on the jurisdiction, trademark registrations typically last for 7 to 10 years, with the option to renew indefinitely, as long as the marks continue to be used. In Nigeria, the initial registration lasts for 7 years, while each successive renewal lasts for a period of 14 years (Trade Marks Act, 1967, s. 23).

Trademark protection is territorial. A trademark registered in one country does not provide protection in another country (Chitra & Sajit, 2024). To ensure a broader scope of protection, businesses may file separate applications in multiple countries or explore international filing systems such as the Madrid System administered by the World Intellectual Property Organization (WIPO), which allows a single application to cover multiple jurisdictions. Some regions, such as the European Union (EU) and the African Intellectual Property Organization (OAPI) offer regional trademarks that cover all member states with a single registration. Businesses may also explore these if it aligns with their expansion agenda.

Key Challenges in Trademark Protection in the Metaverse

As noted earlier, the intersection between the Metaverse and commercial activities has made questions of trademark protection and enforcement in the Metaverse increasingly relevant. The unique nature of these virtual and augmented environments has naturally given rise to new challenges, some of which do not submit to easy resolution by the application of traditional trademark rules and enforcement mechanisms. The main challenges are considered below:

Territoriality vs. Borderless Virtuality

Possibly the most obvious issue posed by the Metaverse vis-à-vis trademarks and brand protection is that of territorial limitation of trademark protection. As earlier stated, Trademark law is fundamentally territorial and rights are granted and enforced within the borders of specific

countries or regions, as the case may be (Calboli & Lee, 2014). Consequently, each jurisdiction maintains its own trademarks registry, its own rules, courts and other enforcement mechanisms.

Conversely, the Metaverse operates as a borderless, interconnected digital environment where interactions are instantaneous and global. A consumer in Lagos, Nigeria can easily interact with, purchase, or experience virtual goods created by a Japanese designer and hosted on an American-based platform, all within a single virtual transaction. Expectedly, this complicates questions of applicable law.

Where an infringement occurs in the Metaverse, perhaps by unauthorized use of trademarks on virtual goods, which country's trademark laws will apply? How does a brand owner determine where to file a complaint? Can the platform itself be held responsible? These issues challenge the traditional framework of trademark enforcement and highlight the need for a re-evaluation of the conventional legal doctrines or for harmonized international rules that can effectively address rights enforcement within the Metaverse's virtual environments (Panwar, 2025).

Inconsistent Classification Standards

Another key challenge lies in the inconsistent adoption of the current versions of the Nice Classification system across jurisdictions. The 12th Edition of the Nice Classification now accommodates virtual assets, downloadable digital goods, and NFTs under classes such as Class 9 (for downloadable virtual goods) and Class 41 (for online entertainment services) (Nice Classification, 12th edition, 2025). These updates provide the basis for registering trademarks relating to activities and products in the Metaverse.

However, not all jurisdictions have adopted the latest edition. For instance, Nigeria still uses the 9th edition of the Nice Classification (Nice Classification, 9th edition, 2006), which does not account for virtual goods or unconventional digital products. Because of this, trademark applicants may find themselves unable to register marks that cover Metaverse-related goods and services or may face pushbacks during the application process. Moreover, brands are left vulnerable to infringement in those jurisdictions that use outdated classification systems. These issues reinforce the need for urgent legal and administrative reforms in Nigeria and similar climes.

Difficulty in Combatting Infringement

The Metaverse presents new avenues for trademark misuse and infringement. They could occur in any number of ways. Infringers may deal in counterfeit digital goods by replicating branded items and selling or distributing them in virtual stores without the consent of the brand owners. They may also use confusingly similar marks that imitate well-known brands to carry on business and induce patronage by customers (Kim, Grady & Ballouli, 2024). Domain and identity squatting is another way, *i.e.*, using usernames, virtual store names, or domain-like identifiers on Metaverse platforms that closely resemble registered trademarks (Panwar, 2025).

Combatting infringement is, however, difficult in the Metaverse because of the structure of its platforms. They are decentralized and lack clear governance structures, while allowing users to operate under pseudonyms, which makes it difficult to identify users and hold them accountable for their actions in virtual spaces (Hendrickson, 2023). Because of difficulties in identifying wrongdoers, traditional modes of enforcement such as cease-and-desist letters, will be ineffective. Other enforcement tools such as takedown notices may vary significantly from platform to platform and are often limited in efficacy. This is in addition to the obvious cross-border limitations.

These gaps highlight the need for innovative enforcement frameworks, involving technology solutions and digital governance protocols, backed by international cooperation.

Practical Steps for Brand Owners

In spite of the challenges highlighted above, brand owners must take deliberate steps to safeguard their trademarks and reputation in the Metaverse's evolving landscape. Below are key strategies to consider:

Expand Trademark Filings

Brand owners should update and expand their trademark portfolios to reflect their presence in virtual and immersive environments, or at least, in anticipation of authorized usage of their trademarks in these environments. This would include filing trademarks for virtual goods and services (e.g., virtual clothing, digital collectibles), covering downloadable digital content such as virtual reality experiences and in-game assets, and protecting blockchain-based assets like NFTs that incorporate brand identifiers like logos (Roibu, 2024). Nike is a leading example, having filed trademark applications in the United States of America in 2021 for its famous “swoosh”, to cover digital goods and services in anticipation of its Metaverse expansion (Chan, 2021). Of course, such filings will only be possible in jurisdictions that have updated their classification systems to recognize these categories.

Actively Monitor Virtual Use

Surveillance in virtual worlds is crucial. Brand owners should employ watch services, brand monitoring tools, and keyword alerts across major platforms like *Roblox*, *Decentraland*, *The Sandbox*, and *Meta's Horizon Worlds*. This would help in identifying unauthorized use of marks, counterfeiting, or confusingly similar branding used by third parties, which would spark efforts towards identifying the parties themselves early on for necessary action.

Collaborate with Metaverse Platforms

Building partnerships with the platform operators is also important. Amongst other things, brand owners should aim to understand the IP enforcement mechanisms available on each platform

and work hand-in-hand with the operators to establish takedown procedures for infringing content. Even though VR/AR platforms typically offer in-platform dispute resolution and IP complaint processes, effectiveness is not assured. Thus, where possible, brand owners should negotiate direct reporting channels or brand protection partnerships to expedite enforcement.

Include Metaverse Clauses in Agreements

Traditional licensing, distribution, and brand endorsement agreements should be revised to account for virtual use. Specifically, when negotiating these agreements, brand owners should include express terms that authorize or restrict the use of trademarks in Metaverse settings. The agreements should clearly define the scope of rights and include clauses for virtual merchandise, NFTs, avatars, and VR experiences. They should anticipate and prevent unauthorized sublicensing or sublicensing to Metaverse developers or third parties and have the necessary indemnity provisions in place.

Engage IP Counsel with Tech Insight

It goes without saying that the intersection of law and technology when it comes to issues of the Metaverse requires legal advisers who understand both the intricacies of trademark protection and the technical workings of these digital platforms and tools. Such persons should be the target of brand owners when choosing IP Counsel. Advisors with this hybrid knowledge can better anticipate the legal issues that are unique to digital platforms and help design the enforcement strategies that are best-suited to address them. They would also be better placed to provide guidance on new registration strategies and to advise on emerging law and policies on virtual goods.

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Conclusion

As the Metaverse continues to evolve, it becomes clear that existing national and international IP frameworks require reform. Such reforms include harmonizing classification for virtual goods, developing new dispute resolution mechanisms for digital platforms and avenues for innovative cooperation between IP offices, platforms, and stakeholders. Nigeria and other African countries, for example, must begin to consider how to accommodate protection for virtual IP assets in virtual environments under existing legislation like the Trade Marks Act. These nations must also look towards promoting education and capacity-building within IP registries and amongst relevant stakeholders, including brand owners.

The Metaverse is much more than just an innovative trend. It has occasioned a real shift in how people interact and do business. For brand owners, there are many opportunities, but just as many risks. Hence, it is important for all brands to adopt strong IP strategies that embrace the realities of virtual and augmented spaces. Lawyers, IP regulators, and innovators must also work together to ensure that this digital age is also a legally secure one for everyone's benefit.

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Data Ownership and IP Rights: Navigating the Intersection of Privacy, AI, and Innovation

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Abstract

As data becomes the foundational asset of the digital economy, the intersection of data ownership, Intellectual property (IP) rights, privacy, and innovation present several challenges. This paper explores how emerging technologies, particularly artificial intelligence (AI), have intensified debates surrounding data ownership, ethical data usage, and legal protections. It delves into the blurred boundaries of ownership and control in an era where data is intangible, replicable, and often co-created. It examines the tension between AI development and existing IP frameworks, particularly regarding copyrighted training data and authorship of AI-generated content. Moreover, it highlights the privacy risks posed by AI models' reliance on large datasets, including data leakage, overfitting, and model inversion attacks. As privacy regulations like Europe's General Data Protection Regulation (GDPR) attempt to restore individual control over data, they also impose constraints on innovation. This paper advocates for clearer legal frameworks, redefined IP laws, standardized data exchange mechanisms, and international cooperation to balance data ownership rights with ethical (responsible) innovation and technological advancement.

Keywords: Data ownership, intellectual property, privacy, artificial intelligence, ethical, responsible, innovation

1.0 Introduction

Data is gradually emerging as the most valuable currency in a digital world (Javaid et al., 2024). The rapid evolution of disruptive technologies such as Artificial Intelligence, Blockchain Technology, Cloud Computing and Internet of Things (IoTs) have solidified data's position as the cornerstone of technological innovation. Yet, an increased reliance on data raises critical questions about ownership, intellectual property (IP) rights, and data privacy (Tekic and Füller, 2023).

As emerging technologies require vast datasets for operations, stakeholders such as individuals and corporations are grappling with conflicting claims over data control, legal protections, and ethical responsibilities (Patel, 2024). This article examines the complex interplay between privacy, artificial intelligence and innovation within the context of data ownership and IP rights.

2.0 Data Ownership in the Digital Age

We exist in an era defined by data. Every click, every purchase, every interaction leaves a digital footprint, contributing to an ever-expanding universe of information. The digital age has ushered in an era where data is not just information but a valuable asset driving innovation and shaping industries. As organizations increasingly rely on data-driven technologies, the boundaries between ownership, privacy, and intellectual property become blurred (Henke and Jacques Bughin, 2016).

Data ownership refers to the legal and ethical rights to control, access, and derive value from data. Unlike tangible assets, data is often intangible, replicable, and can be derived from various sources. As a result, traditional legal frameworks for ownership often struggle to accommodate the unique characteristics of data (Scassa, 2018). Additionally, traditional intellectual property laws may fail to address scenarios where multiple parties contribute to data creation (i.e., several social media users contribute to generating content (Zech, 2016).

As a result, several debates over data ownership rights have intensified, particularly in Europe, where policymakers are considering the introduction of *sui generis* or a distinct class of ownership rights to address the complexities of regulating data. By creating a new class of rights, policymakers aim to establish exclusive rights for those who invest in creating or managing datasets. While proponents argue that such rights incentivize innovation and protect proprietary interests, critics of this category of rights are of the opinion that treating data as property could create barriers to access, stifle competition, and undermine efforts to foster open data sharing (Scassa, 2018) Therefore, the increased reliance on data raises questions about who owns the insights and value derived from combining different datasets (Kerber, 2016).

There are several contexts within which data ownership issues may arise. Firstly, in commercial contexts, data ownership is central to the ability of organizations to monetize the data

they collect (Scassa, 2018). As a result, companies and organizations increasingly view data as an asset to be monetized and to do so, they seek to assert control over the data they collect. However, while formal ownership rights in data are often undefined or unclear in law, control is frequently asserted through contractual agreements such as terms of service and technological protection measures like encryption or access restrictions (Scassa, 2018). In practice, companies and dataset managers exercise a disproportionate amount of influence over users conditioned to click “Accept” without thinking twice about what they’re agreeing to..

In addition, the accumulation of large and exclusive datasets by dominant digital platforms has raised serious concerns in terms of market competition. This is because when data ownership is concentrated in the hands of a few companies, it can create significant barriers to entry for competitors, particularly in data-driven sectors like AI, advertising, and e-commerce (Ferrari, 2022). Organizations like OpenAI are currently being sued for copyright infringement, after granting millions of users’ complimentary access to their open source, ChatGPT platform; only to monetize more advanced features dependent on the same datasets (Baker & Hostetler LLP, n.d.).

Lastly, another important and widely discussed aspect of data ownership is how it connects to privacy. While individuals are often not seen as owners of the data they generate, emerging privacy regimes are moving toward giving individuals more robust control over their personal data with rights such as data portability, the right to erasure, and explicit consent (Asswad and Marx Gómez, 2021).

3.0 Data Ownership and Intellectual Property Issues in the Use of Artificial Intelligence

AI models, generative models especially, are trained on massive datasets that often include copyrighted material. This raises concerns about whether the use of such content in training constitutes fair use or copyright infringement. Therefore, a core intellectual property concern with AI systems is their use of training data that may include copyrighted materials such as books, articles, images, and code (Malikova, 2024). Under copyright law, using such data typically requires the permission of the holder of the copyright, unless a specific legal exemption applies. However, the vast scale of data needed to train these AI models makes obtaining individual licenses from every copyright holder impractical, if not impossible (Quang, 2021).

Mitigating IP infringement is even more complicated in light of the widespread use of web scraping or the automated process of extracting data from websites. While some online content is covered by permissive licenses like Creative Commons that allow for reuse, many websites include terms of service that explicitly prohibit scraping (Chandrasekhar, 2025). Even if the scraped content is not protected by copyright, violating these terms could still pose legal risks. This creates a situation similar to data protection consent under privacy laws, where the costs of obtaining consent from each person or rights holder are high (Brown et al., 2024).

Another complex issue is the ownership of data generated by AI systems. Traditional IP frameworks are built on the concept of human authorship. As such, there is ongoing debate over whether AI-generated works such as images, music, or articles can be copyrighted, and if so, who the rightful owner is among the user, the developer, or the AI tool itself (Malikova, 2023).

Likewise, traditional IP frameworks struggle to accommodate AI's unique challenges. In many jurisdictions, AI-generated works are not eligible for copyright protection unless a human can be identified as the author (Zurth, 2020). However, several critics of this decision have stated that this position risks stifling innovation by leaving AI outputs in legal uncertainty (Hristov, 2017).

4.0 Privacy Concerns in Data-Driven Innovation

Artificial intelligence has revolutionized industries by leveraging vast amounts of data to improve decision-making, automate processes, and create innovative solutions. AI, particularly generative models like Large Language Models (LLMs), pose significant privacy and data protection challenges due to its pervasive reliance on personal data for training. This widespread use of data, often collected without explicit consent, often clashes with privacy rights related to consent to processing of data, raising both ethical and legal concerns. For example, in 2023, Italy's data protection authority, Garante della Privacy, temporarily banned ChatGPT due to concerns over its non-compliance with EU privacy laws. However, this ban was later lifted after OpenAI implemented certain privacy compliance measures (Hodžić, 2023).

Another privacy concern in data driven innovation within the context of artificial intelligence systems is that AI systems can memorize parts of their training data sets, either through overfitting where the model learns the training data too well, or by retaining unique details from the data distribution and this increases the risk of leaking sensitive information directly through their outputs (Novelli et al., 2024). For example, in the case of generative AI systems, AI models may inadvertently reveal sensitive information which it retained from its training data in response to an otherwise generic user prompt.

Furthermore, even when data is not explicitly memorized, malicious actors can exploit vulnerabilities in the AI system by using model inversion attacks, which can reverse-engineer inputs to reveal personal details. In addition to this, user interactions with AI tools also introduce risks, as the users may provide prompts that may contain personal data of third parties (Novelli et al., 2024).

In order to ensure data protection, regulations such as the GDPR must grant individuals significant rights over their personal data, including the right to access, rectify, and erase their information (Hoofnagle et al., 2019). Necessarily, these regulations will impact the collection, use, and sharing of data for AI development and training.

For instance, using personal data to train AI algorithms might require explicit consent or a legitimate legal basis under relevant data protection laws. While some may argue that

anonymization and pseudonymization techniques are often employed to mitigate privacy risks, the effectiveness of these methods in the context of sophisticated AI analysis may require additional measures (Humerick, 2017).

Also, the complexity of determining the appropriate context or the right recipient for sensitive information is a subject of ongoing discussion, especially in the context of LLMs where their diverse applications, purposes, and operational environments further complicates things (Yan et al., 2024). This uncertainty is compounded by the fact that data is often collected and shared across multiple platforms, making it hard to pinpoint a single owner or responsible party. In many cases, those who generate or provide data do not retain meaningful control over how it is used, while companies and platforms that aggregate data typically hold the practical power to determine access and usage.

In short, the conflict between privacy and innovation persists. While privacy regulations might aim to protect data ownership rights, overly restrictive rules will undoubtedly hinder the development and deployment of beneficial AI applications that rely on large datasets to operate efficiently (Floridi et al., 2018).

5.0 Navigating the Intersection of Privacy, AI, and Innovation

Establishing clear legal frameworks for data ownership is an important step in navigating the complex interplay of privacy, AI, and innovation. Distinguishing between the mechanisms for owning and controlling the use of data is important as it allows for an approach where individuals or entities might have rights over their personal data while still enabling its use for AI development under specific, legally defined conditions. Clear regulatory guidance can foster innovation by providing a more predictable legal landscape for data-driven technologies, while simultaneously empowering individuals with greater control over their information, thus safeguarding privacy.

Furthermore, it is important to rethink existing intellectual property frameworks. This is largely because current IP laws, designed for human-created works, struggle to address the intricacies of AI-generated content. As a result, defining authorship and inventorship when AI is involved is paramount in order to provide incentives for both AI developers and owners of underlying data. Furthermore, exploring new methods of protection specifically for AI models and datasets will incentivize investment and innovation in the rapidly evolving AI landscape. However, this must be balanced with the need to ensure open access to data for research and development, preventing the monopolization of essential resources capable of stifling progress and exacerbating privacy risks by concentrating control in the hands of a few.

Similarly, data marketplaces with standardized data licensing agreements can create more transparent and efficient mechanisms for data exchange. These initiatives should prioritize fair compensation for data owners, clear usage guidelines, and robust privacy safeguards to encourage participation and ensure ethical data practices that do not undermine ownership of data rights.

Given the inherently global nature of data flows and the development of AI technologies, international cooperation is indispensable for establishing consistent legal and ethical frameworks. Divergent regulations and standards across jurisdictions can create significant barriers to innovation and complicate the enforcement of privacy rights. Therefore, fostering dialogue and collaboration beyond the US is essential to developing shared principles and guidelines on data ownership, IP protection for AI, privacy safeguards, and ethical considerations.

6.0 Conclusion

In today's global economy, where digital information is paramount, resolving questions about data control and protection, especially concerning generative AI, becomes ever more critical. The relentless pace of AI and data-driven technologies has far exceeded current legal capabilities, resulting in widespread ambiguity. The overlapping challenges of data ownership, intellectual property, and privacy create a landscape where individuals and organizations struggle to define their rights and responsibilities. Ultimately, the future of innovation depends on a collective, global effort to establish and implement robust legal and ethical frameworks that govern data use.

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The Future of IP Law Practice: Adapting to Emerging Technologies and Evolving Business Models

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Abstract

This paper explores the evolving landscape of intellectual property practice in the face of rapid technological advancements, particularly with the rise of artificial intelligence (AI) and blockchain. The 21st century has witnessed unprecedented technological growth, transforming industries and challenging traditional frameworks. As the creation and dissemination of intellectual property become increasingly automated, the role of IP practitioners is undergoing significant changes. The paper delves into the key challenges and opportunities presented by emerging technologies, highlighting the need for adaptation and innovation in IP law to foster innovation while safeguarding creators' rights.

Emerging technologies such as AI and blockchain are reshaping the intellectual property landscape but they also pose several challenges. To navigate these challenges, the paper emphasizes the importance of adapting IP practice to emerging technologies and evolving business models. Ultimately, the future of IP practice is not merely about responding to technological changes but about proactively shaping intellectual property frameworks to align with technological advancements.

Keywords: Intellectual Property, Artificial Intelligence, Blockchain Technology, Emerging Technologies

1.0 Introduction

The 21st century is characterized by unprecedented technological advancement, with innovations like AI, blockchain rapidly transforming several industries. These advancements necessitate a critical reassessment of traditional IP law frameworks. As the lines between tangible and intangible assets blur, and as the creation and dissemination of intellectual property become

increasingly automated, the role of IP law practitioners is evolving. This paper examines the key challenges and opportunities facing the IP law practice, emphasizing the need for adaptation and innovation in response to these transformative forces.

2.0 Intellectual Property Considerations in the Age of Emerging Technologies

Emerging technologies are significantly reshaping the landscape of intellectual property (IP) across various domains (Singh & Singh, 2023). The rapid advancement of technologies such as artificial intelligence (AI) and blockchain is not only driving innovation but also challenging traditional IP frameworks. According to the United States Copyright Office, there has been a consistent rise in the registration of copyrights for digital works over the past twenty years. In 2000, there were 275,894 registrations for digital media, which surged to 1,327,567 by 2020, underscoring the growing importance of digital content in the realm of intellectual property (Adams, 2023).

As the technological revolution continues to unfold, it is clear that adapting existing IP frameworks will be critical to fostering innovation while safeguarding the rights of creators and inventors in the digital age. This section will examine different aspects of emerging technologies vis-à-vis their impacts on intellectual property within the digital age.

2.1 Intellectual Property Issues in Artificial Intelligence

The fast-paced nature of technological development, availability of large datasets as well as the rapid increase in computing systems have all contributed to the rapid evolution of artificial intelligence systems (Colther & Doussoulin, 2024). While this presents significant potential for development, it also presents a complex and multifaceted challenge for intellectual property. Data from the UK Intellectual Property Office (IPO) indicates a 15% rise in patent applications focusing on artificial intelligence (AI) and machine learning technologies over the past five years. This highlights the growing need to align intellectual property frameworks with the rapid advancements in emerging technologies (Adams, 2023).

More recently, the question of AI-generated works and their eligibility for copyright or patent protection constitutes a subject of intense debate (Halwachi, 2024). This is largely due to the fact that traditional IP frameworks are originally rooted in human authorship, and this presents an intense struggle toward accommodating the autonomous creative and inventive capabilities of AI systems. Therefore, the emergence of artificial intelligence systems raises several key issues for intellectual property (Mbah, 2024).

Firstly, the issue of copyright raises questions about the ownership of works generated by AI. The rise of AI-generated works has sparked significant debate over copyright ownership. Some legal frameworks do not recognize AI as authors, meaning works solely generated by AI lack copyright protection and fall into the public domain (Abbott & Rothman, 2023). However, when human authorship is involved, copyright may apply to the human-created elements, leaving AI-

generated portions unprotected. These ambiguities raise critical questions about ownership, especially when generative AI tools are trained on copyrighted materials without consent, potentially infringing on existing copyrights. Furthermore, AI's ability to manipulate existing works challenges the boundaries of copyright infringement and the fair use doctrine (Hembt & Smeets, 2024).

Regarding patents, there are serious challenges and questions to be asked regarding AI-generated inventions. Can AI be considered an inventor, or should the patent be assigned to the AI's developer? In essence, the increasing use of AI in research and development necessitates a reevaluation of the criteria for granting patents (Sun, 2022). Furthermore, AI's ability to analyze vast datasets poses risks to trade secrets. For instance, advanced machine learning algorithms could inadvertently uncover proprietary information or patterns from publicly available data. Moreover, businesses must consider how AI systems trained on proprietary datasets could inadvertently expose confidential information during their operation or development (Rauf & Jim, 2024).

On the positive side, Artificial intelligence (AI) has become a powerful tool for enhancing intellectual property (IP) protection by enabling more efficient detection and enforcement of IP rights (Mbah, 2024). For example, AI algorithms can analyze vast amounts of online data to identify potential infringements. These capabilities provide businesses with proactive measures to safeguard their IP assets, reducing reliance on manual monitoring and increasing the speed and accuracy of infringement detection (Mbah, 2024).

Beyond detection, businesses can achieve a more comprehensive approach to protecting their intellectual property in the modern era by leveraging AI strategically to enhance protection of their intellectual property (Lee et al., 2021). For example, blockchain-based solutions integrated with AI can secure immutable records of ownership and usage, providing strong evidence in disputes over copyright or patents (Mbah, 2024). Also, AI's ability to synthesize data rapidly can help businesses conduct audits of their intellectual assets, identifying unprotected value and assessing risks associated with third-party rights (Munoko et al., 2020). These advancements not only strengthen IP enforcement but also empower businesses to maximize the value of their creations while minimizing risks of infringement.

2.2 Blockchain Technology and Intellectual Property

Blockchain technology has evolved significantly beyond its original role in cryptocurrencies. Its secure and decentralized framework makes it highly effective for applications like managing digital identities, ensuring the traceability of goods to verify their origin and ownership, and streamlining agreements via smart contracts (Ikonne et al., 2024). Blockchain technology, powered by its decentralized ledger system, is increasingly transforming the landscape of intellectual property rights (IPR). By leveraging smart contracts, blockchain improves

transparency, streamline transactions and royalty payments, and offers the potential to minimize conflicts (Ghosh, 2025).

A key benefit of blockchain technology for intellectual property (IP) protection lies in its capacity to create a secure and unchangeable record of ownership. When IP rights are registered on a blockchain, creators and inventors can generate lasting and easily verifiable proof of their ownership, accessible to others for validation. This capability reduces the likelihood of intellectual property related disputes and ensures that holders of intellectual property rights receive proper acknowledgment and compensation for their innovations (Ito & O'Dair, 2019).

However, the immutability of blockchain records presents significant challenges in legal disputes requiring modifications or deletions. Blockchain technology prevents tampering or alteration of recorded data, making it ideal for establishing indisputable proof of ownership and originality. However, this inflexibility becomes problematic when legal systems mandate corrections, deletions, or updates to records due to errors, privacy concerns, or court orders (Frolova & Kupchina, 2023).

Also, blockchain technology provides potential for the management of intellectual property rights. For example, smart contracts, which are self-executing agreements programmed on the blockchain network can be used for automating intellectual property licensing and royalty payments (Guadamuz, 2020). By encoding the terms of an agreement directly into the blockchain, these smart contracts automatically execute transactions when predefined conditions are met. This automation ensures transparency as all parties can verify the terms and execution of the agreement and enhance efficiency by streamlining intellectual property related transactions (Guadamuz, 2020). Additionally, smart contracts can help mitigate the risk of infringement by enforcing compliance with licensing terms and ensure that creators are promptly and accurately compensated for the use of their intellectual property rights. This innovation helps to simplify the management of intellectual property rights (Bodó et al., 2018).

Furthermore, blockchain technology can be an innovative tool for providing access to intellectual property protection. For example, blockchain-based IP registries can offer a decentralized and transparent alternative to traditional registries, addressing challenges like inefficiency and limited accessibility, particularly in developing countries (Jain & Sharma, 2024). These registries can leverage blockchain's secure and immutable ledger to record IP rights, ensuring easily verifiable ownership records. This can significantly enhance the registration and licensing of IP rights in regions where centralized systems are underdeveloped or prone to corruption (Jain & Sharma, 2024).

However, in terms of enforcement, while blockchain technology can be a powerful tool for proving ownership and establishing a verifiable record of intellectual property due to its inherent immutability, it does not inherently address the challenge of enforcing those rights against infringers operating outside the blockchain ecosystem (Goniwada, 2024). In addition to this,

enforcement still relies on traditional legal systems, which may lack the tools or jurisdiction to act against unauthorized use of intellectual property, especially in a global digital context. Additionally, blockchain cannot directly prevent or deter infringement as it merely serves as a record-keeping mechanism. This highlights the need for complementary legal frameworks and enforcement strategies to bridge the gap between blockchain's capabilities and real-world IP protection (Ikonne et al., 2024).

3.0 Adapting to Emerging Technologies and Evolving Business Models

Emerging technologies have permeated various fields, and intellectual property is not exempt from the potential for development in this regard. Although several challenges still exist in the deployment of these technologies in the field of intellectual property, it is not out of place to state that there are still several potentials for development. Therefore, adapting to these emerging technologies is no longer a question of if, it has now become a matter of how we can harness them for the future of intellectual property law practice. The following recommendations will provide an insight into the various ways to adapt to emerging technologies vis-à-vis evolving business models.

3.1 Leveraging Advanced Technologies for IP Management

A key way to adapt to emerging technologies is by leveraging advanced technologies for intellectual property protection and management. The integration of emerging technologies like artificial intelligence (AI) and blockchain into IP law practice offers great potential. For example, AI can streamline processes such as patent searches, trademark monitoring, and copyright infringement detection, enhancing efficiency and accuracy. These tools will allow intellectual property practitioners to manage rights more effectively and adapt to the complexities of digital innovation (Unnikrishnan, 2024).

3.2 Enhancing Digital Literacy for IP Practitioners

As emerging technologies continue to evolve, it is crucial for IP professionals to enhance their digital literacy. This involves staying updated on the latest technological advancements and understanding how they impact intellectual property practice. Therefore, by investing in continuous education and training, IP practitioners can be well positioned to advise clients on how to navigate the complex landscape of emerging technologies in relation to intellectual property (Trencheva et al., 2020).

3.3 Development of Flexible Legal Frameworks

Also, developing flexible legal frameworks is another means of adapting to emerging technologies within the context of intellectual property. Traditional intellectual property laws often struggle to address the challenges posed by emerging technologies. As a result, developing flexible regulatory frameworks is essential for adapting to emerging technologies and evolving business

models. Intellectual property laws must be capable of evolving alongside technological advancements to ensure they remain relevant and effective. This involves creating legal frameworks that are adaptable to new challenges and opportunities (Kumar, 2024).

3.4 Fostering International Collaboration on Intellectual Property Standards

On a global scale, emerging technologies often transcend national borders, necessitating international collaboration to establish consistent intellectual property standards. This collaboration can help harmonize IP laws across countries, facilitating global innovation and reducing complexities for businesses operating internationally. International agreements and forums can provide platforms for discussing and setting these standards, ensuring that intellectual property protection aligns with technological advancements. Also, as digital technologies transcend borders, enforcing IP rights globally becomes increasingly complex. Intellectual property practitioners should also explore innovative enforcement strategies that leverage technology while collaborating with international organizations to harmonize laws across jurisdictions (Feng & Sik, 2024).

3.5 Enhancing Collaboration Among Stakeholders

Emerging technologies often blur industry boundaries, requiring cross-sector collaboration to address IP challenges effectively. Thus, intellectual property practitioners can foster partnerships between technology developers, businesses, and policymakers to create cohesive strategies for intellectual property protection within the domain of emerging technologies. These collaborative efforts can lead to standardized intellectual property governance frameworks, consistent intellectual property management systems, and ethical guidelines that promote innovation while safeguarding intellectual property rights (Akpobome, 2024).

4.0 Conclusion

The future of IP practice is inextricably linked to the rapid evolution of emerging technologies and business models. Adapting to this dynamic environment requires a proactive and forward-thinking approach, characterized by technological literacy, strategic advisory, interdisciplinary collaboration, and advocacy for legal reform. IP practitioners must embrace innovation and engage in continuous learning to effectively navigate the challenges and opportunities presented by emerging technologies. By doing so, they can ensure that IP law remains a relevant and effective tool for promoting innovation and protecting intellectual property in the 21st century and beyond. The future of intellectual property is not simply about reacting to change but about shaping it and ensuring that intellectual property frameworks remain adaptable in the face of technological advancements.

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IP Enforcement in the Age of Digital Piracy and Counterfeiting

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Abstract

The rapid advancement and widespread adoption of digital technology have fundamentally transformed the landscape of intellectual property (IP) enforcement, introducing a complex array of new challenges. Among these challenges are the pervasive issues of digital piracy and counterfeiting, which have become increasingly sophisticated and difficult to control. This paper critically examines the impact of unauthorized reproduction and distribution of copyrighted materials, as well as the manufacture and circulation of counterfeit goods, on economic interests, innovation, and public safety. Such illicit activities not only erode the revenues of legitimate creators and businesses but also stifle creativity and technological progress, while posing significant risks to consumers through substandard or unsafe products.

Focusing specifically on Nigeria, the study analyzes the country's evolving legal frameworks designed to address these challenges. Key legislative instruments such as the Copyright Act 2022, the Cybercrimes Act 2015, and the Trade Marks and Merchandise Marks Acts are explored in detail, highlighting their provisions for modern enforcement mechanisms, including digital takedown procedures and enhanced criminal sanctions. Despite these robust legal measures, enforcement remains a formidable task due to factors such as the anonymity afforded by digital platforms, the cross-border nature of online infringement, and the exponential growth of digital marketplaces.

The paper argues for the urgent need to integrate advanced technological solutions with strengthened international cooperation to effectively safeguard intellectual property rights in the digital era. Ultimately, it advocates for a dynamic, technology-driven, and collaborative approach as essential to preserving the integrity of intellectual property, thereby fostering sustainable economic growth and cultural development in Nigeria and beyond.

Keywords: Intellectual Property, Digital Piracy, Counterfeiting, Infringement, Digital Takedown, Technological Protection Measures.

Introduction

In an increasingly interconnected and digitized world, the enforcement of intellectual property (IP) rights faces unprecedented challenges. The rapid proliferation of digital technologies has made the unauthorized reproduction, distribution, and sale of copyrighted works, trademarks, and patented innovations easier and more widespread than ever before. Digital piracy and counterfeiting not only undermine the economic interests of rights holders but also threaten innovation, consumer trust, and cultural development. As traditional enforcement mechanisms struggle to keep pace with these evolving threats, there is an urgent need to explore adaptive legal frameworks, technological solutions, and international cooperation aimed at safeguarding IP rights in the digital age.

Digital Piracy

Digital piracy represents one of the most profound challenges to IP enforcement. Digital piracy is the unauthorized reproduction, distribution, and use of copyrighted content such as music, films, software, books, and broadcasts through digital platforms without the permission of the rights holders (Jindal, 2024). The growth of internet access and mobile technology across Nigeria has expanded opportunities for content creators, but it has equally facilitated widespread infringement activities that undermine their rights and economic interests (Jindal, 2024).

In Nigeria, the primary legal framework for addressing digital piracy is the Copyright Act 2022, which repealed the Copyright Act, Cap C28, Laws of the Federation of Nigeria 2004. The 2022 Act modernized copyright protection by specifically recognizing digital works and extending protection to online infringements. By virtue of Section 27 of the Copyright Act, acts such as unauthorized online dissemination, streaming, and downloading of copyrighted material without a license from the copyright owner are clearly prohibited (Copyright Act 2022, s 27). Section 20 of the Act further empowers copyright owners to take civil action against infringers, including seeking injunctions, damages, and delivery up of infringing copies (Copyright Act 2022, s 20).

Beyond civil remedies, the Act also provides for criminal sanctions against digital piracy. Section 29 of the Act stipulates that any person who communicates a work to the public without authorization, especially through digital means, commits an offense and is liable to fines and imprisonment (Copyright Act 2022, s 29). Furthermore, the Nigerian Copyright Commission (NCC) has been vested with broader enforcement powers under the Act, including the authority to conduct digital monitoring and to collaborate with internet service providers (ISPs) to curtail access to infringing content (Kolawole & Alabi, 2024).

Progressively, Nigeria's approach to digital piracy is also informed by the Cybercrimes Act 2015. While the Cybercrimes Act focuses broadly on offenses committed through computer

systems and networks, it reinforces copyright protection by criminalizing unauthorized access and transmission of protected works. Section 16 of the Cybercrimes Act criminalizes unauthorized access to computer systems to commit intellectual property violations, thereby supporting the efforts under the Copyright Act (Cybercrimes (Prohibition and Prevention) Act 2015, s 16).

Nigeria is also a party to several international agreements that guide its enforcement of copyright in the digital environment. Notably, Nigeria is a member of the World Intellectual Property Organization (WIPO) and has acceded to the WIPO Copyright Treaty (WCT) 1996 and the WIPO Performances and Phonograms Treaty (WPPT) 1996. Both treaties require signatories to provide legal remedies against the circumvention of technological protection measures (TPMs) and the unauthorized online use of copyrighted works. The bypassing of technological measures placed on streaming platforms and websites to prevent unauthorized copying constitutes a circumvention that is contrary to copyright law and subject to criminal prosecution (Efthimiadis, 2024). Section 50(1) of the Copyright Act is to the effect that TPMs that protect access to work is protected. Importantly, the entire section provides a blueprint on the issues of TPMs (Copyright Act 2022, s 50(1)).

Digital piracy often occurs anonymously and across borders, making detection and prosecution difficult. Despite the robust legislative framework, enforcement remains a significant hurdle as the proliferation of digital works such as films, music, e-books, digital arts continue to grow on social media apps such as Telegram and other illegal websites where these works are shared widely.

Counterfeiting

Counterfeiting is the production or distribution of goods under someone else's name without permission, often with the intent of deceiving consumers and profit from the reputation and goodwill of established brands (INTA, 2024). It is a significant global problem that spans various industries including fashion, pharmaceuticals, electronics, currency and fast-moving consumer goods (FMCGs). Counterfeiting undermines brand integrity, poses serious health and safety risks, and results in substantial economic losses for legitimate businesses and governments (Rojek, 2016).

At its core, counterfeiting involves the unauthorized replication of a product and its packaging to resemble the original. This deception is usually aimed at consumers who believe they are purchasing authentic goods. In some cases, consumers knowingly buy counterfeit goods, often because they are sold at a fraction of the price of the original, but the practice still weakens the value and exclusivity of genuine brands. The effects of counterfeiting are wide-reaching.

For businesses, counterfeiting leads to revenue loss, brand devaluation, and increased costs associated with brand protection efforts such as legal battles and enforcement measures. For governments, counterfeiting erodes tax revenues and can strain regulatory systems tasked with ensuring public safety and fair competition (Atoyebi, 2024). On a broader level, counterfeiting has

been linked to organized crime, with proceeds from counterfeit goods funding illicit activities around the world.

Consumers are directly affected by counterfeiting, especially when it comes to products like pharmaceuticals, automotive parts, and electronics where quality and reliability are critical. Counterfeit drugs, for example, may contain incorrect doses or harmful substances, putting lives at risk. Similarly, counterfeit automotive parts may fail under stress, leading to accidents and injuries. The rise of e-commerce and global trade has made counterfeiting more pervasive and difficult to control. Online marketplaces provide counterfeiters with easy access to vast consumer markets while complicating efforts to track and shut down illicit operations (Atoyebi, 2024). Despite the efforts of governments and international organizations to enforce intellectual property rights, counterfeiters frequently operate across borders, taking advantage of inconsistent legal frameworks and enforcement capabilities in different jurisdictions.

IP Enforcement in Combatting Digital Piracy

The expansion of digital technology has dramatically changed the production, distribution, and consumption of creative works. At the same time, it has created serious threats to the protection and enforcement of intellectual property rights. Digital piracy undermines the creative economy, especially the music, film, and publishing sectors. The Nigerian legal framework has responded with measures aimed at addressing these challenges, notably through the Copyright Act, 2022, which introduced more targeted and practical enforcement mechanisms for the digital environment (Atoyebi, 2024).

Section 56 of the Act sets the procedure for takedown of infringing content. The section provides that copyright owners may serve a takedown notice on online service providers (OSPs), requesting the removal or disabling of access to infringing content hosted on their platforms. This provision requires that the takedown notice contains specific information, including identification of the copyrighted work alleged to have been infringed, details of the infringing material, and a statement asserting the ownership of the rights in question. The notice must also include an undertaking by the complainant that they will indemnify the service provider against any liability that might arise from complying with the notice (Copyright Act 2022, s 56).

Upon receipt of a properly issued takedown notice, the online service provider is obligated to act expeditiously to either remove or disable access to the infringing material. Failure to comply with a valid takedown notice may expose the service provider to liability for copyright infringement. This approach places an important responsibility on intermediaries, making them active participants in the enforcement process against digital piracy.

In addition, the Act provides a mechanism for counter-notification. If a user believes that the material was wrongly taken down, they may send a counter-notice to the service provider explaining their position. Upon receipt of the counter-notice, unless the copyright owner files an action in court to restrain the user, the service provider may restore the material after a specified

period. This two-way mechanism seeks to balance the interests of copyright holders with the rights of users against wrongful or abusive takedown demands (Agbakoba-Onyejianya and Akinade, 2024).

The takedown procedure reflects international best practices similar to those seen under the United States' Digital Millennium Copyright Act (DMCA) but tailored to Nigeria's enforcement realities. It offers a practical and less litigious option for rights holders to protect their work in the digital environment, recognizing the difficulty of tracking and litigating every single instance of online infringement. The inclusion of takedown procedure in the Act has helped creatives to pull off infringing content from platforms like YouTube, however, there are no recorded cases of takedown notices for Telegram channels, but it is suggested that the procedure can apply, nevertheless.

Apart from the takedown mechanism, the Copyright Act retains traditional enforcement tools, including civil actions for infringement where rights holders may seek remedies such as damages, injunctions, and orders for the delivery-up of infringing copies. Criminal sanctions for willful infringement for commercial advantage are also available, including fines and imprisonment.

IP Enforcement in Combatting Counterfeiting

The primary legal instruments for combating counterfeiting are the Trade Marks Act Cap T13 Laws of the Federation of Nigeria 2004, the Merchandise Marks Act Cap M10 Laws of the Federation of Nigeria 2004, and relevant provisions of the National Agency for Food and Drug Administration and Control (NAFDAC) Act. IP PROFESSIONALS

The Trade Marks Act provides a clear legal basis for trademark registration and enforcement. A registered proprietor has the exclusive right to use the trademark for the goods or services it covers (Trade Marks Act, s.4). Infringement arises when a third party uses a mark that is identical or confusingly similar without the consent of the owner, likely causing deception or confusion among the public. The Act allows for civil remedies such as injunctions, damages, accounts of profits, and delivery up of counterfeit goods. However, enforcement is not restricted to civil actions alone. Counterfeiting of trademarks can attract criminal sanctions under the Merchandise Marks Act, which prohibits the forgery or fraudulent imitation of any mark and prescribes penalties including imprisonment (Eke, 2020).

The Merchandise Marks Act, one of the lesser-known intellectual property laws, specifically addresses false trade descriptions and forged trademarks. Section 3 of the Act criminalizes the application of false trade descriptions to goods or the sale of goods with false trademarks (Merchandise Marks Act, s 3). Section 5 of the Act further criminalizes the possession of goods for sale knowing they bear a forged trademark. The Act empowers the police and other law enforcement agencies to seize counterfeit goods, and it provides for the prosecution of offenders in criminal courts (Merchandise Marks Act, s 5).

Apart from these statutory measures, intellectual property owners may initiate private enforcement actions through the courts. Civil litigation offers remedies such as permanent injunctions, orders for the destruction of counterfeit goods, and monetary compensation for losses suffered due to infringement. In practice, rights holders often combine private enforcement with regulatory and criminal measures to maximize effectiveness.

Additionally, several initiatives have been undertaken to strengthen enforcement. Public-private partnerships, such as the Anti-Counterfeiting Collaboration (ACC) Nigeria, bring together government agencies, rights owners, and legal practitioners to improve coordination and develop practical enforcement strategies. Trademark owners are also increasingly using technological tools such as product authentication solutions and track-and-trace systems to combat counterfeiting. Additionally, ongoing reforms to intellectual property legislation aim to update existing laws to better address modern challenges.

Conclusion

The fight against digital piracy and counterfeiting demands a dynamic approach. Strengthening IP enforcement in the digital era requires not only updating legal frameworks but also leveraging technology, fostering public awareness, and enhancing cross-border collaboration. As the digital economy continues to evolve, so must strategies for protecting intellectual property, ensuring that innovation and creativity are duly rewarded. Ultimately, a balanced and forward-thinking enforcement regime is essential to maintaining the integrity of the global IP system and promoting sustainable economic and cultural growth.

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Artificial Intelligence and Copyright: Who Owns AI-Generated Works?

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Abstract

Over the past two years, debates about the relationship between copyright law and artificial intelligence have intensified, especially following the release of OpenAI's ChatGPT. The use of copyrighted material by AI systems has raised concerns about potential violations of existing copyright laws. This article examines current legal requirements for copyright protection, including the standards of originality and fixation. It also analyzes why creators have initiated lawsuits to protect their rights. The discussion considers whether these actions are driven by fear or by legitimate concerns about AI's impact on creativity in the digital age, where data and visibility are crucial for creators. The article further evaluates the application of "fair use" or "fair dealing" doctrines and whether a balance can be achieved that rewards creators while allowing technological innovation. Finally, it offers recommendations to strengthen copyright protection, promote transparency and accountability, and encourage collaboration among stakeholders to address the challenges posed by AI.

Keywords: Copyright, Artificial Intelligence, Generative work, ChatGPT

Introduction

Following the recent release of a new version of ChatGPT featuring a viral Studio Ghibli-style image generation stunt that replicates the distinct Japanese anime style (O'Brien & Parvini, 2025), fans of Hayao Miyazaki have been able to transform popular internet memes or personal photos into the unique style of Ghibli's founder. However, this development has raised AI copyright concerns regarding authorship, ownership, ways of exploiting copyrighted material in the digital age, available dispute resolution mechanisms, and whether alternatives such as "fair

dealing,” “fair use,” licensing, or open source could create the necessary balance in the creative space as it applies to copyrighted materials.

When considering copyright, the primary focus is usually on originality, which must meet the basic requirement of being expressed in any medium and involve some effort to give the work an original character. In contrast, AI-generated works from large language models such as ChatGPT, DALL·E 2, Midjourney, Stable Diffusion, JukeBox, and MusicLM attempt to predict or produce the next text, image, or music based on prompts inputted by humans and data scraped from the internet to generate the final output. According to Callison-Burch, the generation continues until a word count limit is reached or until the model outputs a special “end of generation” token, which signifies the end of a complete thought or a good stopping point for a passage of text (Callison-Burch, 2023).

The Big Debate

One of the primary debates when it comes to copyright and AI-generated work has centered on the levels of human involvement in creating these copyrighted works. This is because the thin line between inspiration and infringement is so invisible that liability is being demanded to be assigned to the companies developing and deploying these AI models. These technology companies have also been in conflict with authors and performers, and their defense has always been that the use of these datasets, composed of copyrighted work, amounts to fair use and not infringement. However, the creators are all demanding fair remuneration, recognition, and identification as authors of the work used while making emphasis on their moral rights that have been tampered with. This is especially because, for copyrighted works, originality is synonymous with authorship.

Furthermore, under most copyright laws, the presence of a human authorship is what would guarantee that the said copyrighted work is protected under the law and in an event whereby AI models like DALL·E 2, or Midjourney are used, the creator seeking protection under the law is required to disclose such use in their application so a thorough examination of the application to copyright the said work would be carried out. This was the case in the *Zarya of the Dawn* case (United States Copyright Office, 2023) where the U.S. Copyright Office rejected the application, citing insufficient human authorship (*Zarya of the Dawn v The United States Copyright Office*, 2023).

However, in a case where you are trying to determine originality and whether the work is deserving of copyright protection, this will depend on if the work is an AI-assisted work or AI-generated work as well as what the laws actually provides in relation to the basic requirements for such intellectual protection and what the copyright implication on this work would be. For instance, on March 18 2025, in the case of *Stephen Thaler v Shira Perlmutter, In Her Official Capacity as Register of Copyrights and Director of the United States Copyright Office and U.S.*

Copyright Office, a 3 judge panel of the US Court of Appeal for the District of Columbia had ruled that they agreed with the decision of the Copyright Office to deny Dr. Thaler's application based on its established human-authorship requirement which is in line with the US Copyright Act of 1976.

This changed the direction of the AI and copyright conversation, especially because copyright law incentivizes the creation of original works so they can be used and enjoyed by the public (United States Copyright Office, 2023).

Challenges of Copyright in the Digital Age and Emerging Areas Like AI

The protection requirement of deposition and registration against the automatic IP system most jurisdictions practice serves as a guide for establishing a balance between copyright owners, technology companies who own the AI models, and users who may not be paying attention to what the terms of use are. While the ease of reproduction has been touted to be one of the top challenges in the digital age, the marriage between artificial intelligence and copyright has raised more issues bordering on unlicensed training using existing copyrighted work, copyright infringement and unfair competition. In the defense of technology companies such as OpenAI and Microsoft, works created by using AI models would amount to fair use or fair dealing depending on the jurisdiction. This allows the unlicensed use of copyrighted works under certain conditions to promote freedom of expression without obtaining express consent and permission.

For example, a Creative Commons (CC) license is a voluntary copyright alternative that grants permission for reuse in situations where copyright permission is typically required. However, this does not apply straightforwardly in discussions about copyright and AI-generated works. When copyrighted works are used to train AI models without permission, the financial benefits often go to technology companies, which have frequently challenged creators and copyright law. If a Creative Commons license is obtained to allow users to distribute a work, the question remains whether that work can then be used for AI training. According to Robot (2023), this depends on the specific use: if the AI training falls under a copyright exception or limitation, there is no need to rely on Creative Commons licenses. But if Creative Commons licenses are used for AI training, the relevant terms and conditions of those licenses (Robot, 2023) must be strictly followed.

From an enforcement perspective, a comprehensive mechanism to protect intellectual property rights against AI models should focus on preserving relationships by establishing an acceptable and mutual dispute resolution process. This process should prioritize the interests of authors, performers, and technology companies involved in AI training, while also allowing space for continued investment within the creative economy.

AI: The Big Flaw in Between Creativity

Recently, the introduction of a new AI model, DeepSeek, has raised two major issues in the AI market: whether it constitutes copyright infringement to use copyrighted material to train AI models, and whether it is infringement if an AI model uses outputs from another AI model for training purposes (Solicitors, 2025).

This author is of the view that, despite the significant potential of AI, identifying its flaws within the creative economy requires a focus on AI ethics, transparency, and improved copyright law. Adaptive regulation for all stakeholders is essential to encourage creativity, respect creators' rights, and ensure fair compensation for the use of their intellectual property.

The deployment of AI in creative industries also raises important questions about the appropriate legal framework to govern relationships between content producers and AI operators (Paris, 2025). For example, the case of Andersen et al. v. Stability AI Ltd, which centers on the copyright implications of AI-generated art, highlights the need for a deeper examination of how AI companies use copyrighted works to train their systems and whether these practices violate existing copyright laws (Schor, 2024).

AI's deployment in creative industries raises questions on what appropriate legal framework should govern relationships between content producers and AI operators (Paris, 2025). In the case of Andersen et al. v. Stability AI Ltd which is centered on the copyright implications of AI-generated art requires a deeper examination of how AI companies use copyrighted works to train their systems and whether these practices violate existing copyright laws (Schor, 2024).

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The Future of Copyright in the Age of AI: The Nigerian and International Perspective

According to Toyosi Etim-Effiong, the Nigerian creative economy is projected to contribute \$100 billion to Nigeria's GDP by 2030. However, when discussing the interplay between AI and copyright, existing laws such as the Copyright Act 2022 are limited in protecting Nigerian authors and performers from unauthorized training and misappropriation of their text, images, music, and likenesses (Etim-Effiong, 2025).

To date, Nigeria has not seen any major AI-related case that would spark significant discussion or pose copyright questions at various stages of the AI lifecycle, unlike jurisdictions such as the United States, China, and the EU, where case law and regulations are beginning to set important precedents. As an African country, Nigeria is poised to bring an emerging perspective to the legal debates surrounding copyright and AI-generated works.

Internationally, the United States leads in the number of AI cases and has actively engaged with the implications of AI for copyright law, authors, and performers. The January 2025 "Report of The Register of Copyrights" stated that works generated wholly by AI are not copyrightable and

set out the legal principles for analyzing copyright applications for AI-generated content³. Such frameworks should be adapted to address protection gaps in other jurisdictions, incorporating cross-border provisions to tackle unauthorized use. The “Notice of Inquiry” further concluded that human contributions to AI-generated outputs must be sufficient to constitute authorship, to be analyzed on a case-by-case basis. Countries like Nigeria should consider enacting similar provisions to foster legal development in the AI industry.

The United States has also introduced the Generative AI Copyright Disclosure Act of 2024, requiring developers to disclose copyrighted works used in training their models to increase transparency and address intellectual property concerns. Despite these efforts, it may take time for widespread acceptance of AI-generated works, potentially requiring some adjustment to the exclusive rights traditionally granted to authors and performers.

In contrast, the Beijing Internet Court in China held in the 2023 case of *Li v. Liu* that an AI-generated picture could be protected by copyright if it reflected the original intellectual input of a human, recognizing it as a work under copyright law⁵. The court found the defendant liable for infringing the plaintiff’s rights by using the image without consent, removing the signature watermark, and distributing it publicly. The defendant was ordered to apologize and compensate the plaintiff, and neither party contested the ruling.

Recommendation and Conclusion

As the digital era continues to evolve, it has become imperative to establish a global treaty requiring member states to create a working committee that monitors technology companies owning AI models and holds them accountable for any unlicensed training conducted using their products. Additionally, a new licensing model must be developed to address the extent of misappropriation and to provide fair remuneration to affected authors.

With the increasing number of AI related cases, there may also be a need to establish a specialized AI tribunal composed of experts who meet specific criteria relevant to the disputes, taking into account the complexity of these matters. Existing enforcement mechanisms for online content should be amended to become more swift, reliable, and transparent. Furthermore, the creation of an AI collecting society could help track unauthorized training involving copyrighted works.

Finally, technology companies that own AI models and provide user access should offer an opt-out option and ensure their models comply with copyright law. They must take necessary steps to mitigate potential risks, such as verifying that the training data is free from unlicensed content and developing methods to moderate generated content effectively.

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Enhancing Access to Intellectual Property (IP) in the Digital Era: A Pathway to Sustainable Development

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Abstract

The digital revolution has fundamentally reshaped Intellectual property creation, distribution, and access, presenting both opportunities and challenges for innovation and sustainable development. This article examines the evolving dynamics of IP in the digital age. It highlights key challenges, including digital piracy, jurisdictional ambiguities in cross-border enforcement, the ethical complexities of AI-generated content, and the blurred boundaries of fair use. These issues underscore the inadequacy of traditional IP frameworks designed for a pre-digital world. The article argues that outdated legal structures and enforcement mechanisms risk stifling education, research, and technological progress while disproportionately disadvantaging marginalized communities. To address these gaps, the article proposes actionable strategies, such as modernizing IP laws to reflect digital realities, fostering international legal harmonization, promoting digital literacy, and embracing alternative models like open-source licensing and Creative Commons. By advocating for adaptive policies that balance incentives for innovation with public access, the article positions IP management as a cornerstone of sustainable development in the digital era. Ultimately, it calls for collaborative efforts among policymakers, creators, and users to build inclusive frameworks that prioritize both protection and the global public good.

Keywords: Intellectual Property, Digital Age, Sustainable Development

Introduction

The digital era has fundamentally transformed how Intellectual property is created, distributed, and accessed. Intellectual property serves as a cornerstone of innovation and sustainable development by granting creators exclusive rights to their works. However, the rise of digital technologies has intensified tensions between protecting these rights and ensuring public access as a pathway to sustainable development. While stringent IP protections aim to incentivize creativity, overly restrictive frameworks can stifle education, research, and technological progress. Hence, the need to consider the strategies for enhancing access to Intellectual Property as a pathway to sustainable development in the digital era.

The Evolution of Intellectual Property in the Digital Age

Historically, IP protection was confined to physical mediums such as books, artworks, and inventions. However, the advent of the internet and digital technologies has blurred these boundaries, enabling the reproduction and distribution of creative works (Klein et al., 2015). For instance, the digitization of media in the area of music from MP3s to streaming services today has dismantled traditional business models reliant on intermediaries such as publishers and distributors, shifting the dynamics between creators, intermediaries, and Intellectual property owners.

Essentially, digital technologies have revolutionized the creation, distribution, and consumption of information and creative works, enhancing access to intellectual property while simultaneously complicating the management and protection of IP rights (Unnikrishnan, 2024). This transformation is evident in the rise of decentralized platforms. Social media networks like TikTok and Instagram have democratized content creation, enabling amateur creators to monetize their work through algorithms and ad revenue. Also, platforms like YouTube allow digital creators to reach audiences directly. Thereby, changing the very culture of creativity and innovation.

However, the ease of copying and distributing digital works has led to conflicts over piracy, fair use, and licensing. This shift challenges conventional IP models designed for Intellectual property before the digital era (Vinjamuri & Singh, 2023). Moreover, the rise of blockchain technology and non-fungible tokens (NFTs) has introduced new paradigms for IP management. NFTs enable creators to authenticate digital art and collect royalties through smart contracts, yet they also raise questions about the permanence of digital ownership of Intellectual property rights. Furthermore, these technologies now require creators and consumers to understand Intellectual property rights, commercialization, and licensing to obtain benefits similar to those of previous business models that depended on greater formality.

The World Intellectual Property Organization (WIPO) notes that digital connectivity has expanded IP's scope, necessitating adaptive frameworks (WIPO, 2017). For example, WIPO's

2016 Treaty on Copyright for Libraries and Archives attempted to address digital access gaps, but implementation remains uneven across nations.

Challenges of Intellectual Property in the Digital Age

A significant challenge associated with enhancing access to Intellectual property in the digital age is the issue of digital piracy and unauthorized distribution (Celestin, 2024). The ease of copying and distributing digital content has led to widespread piracy, undermining the economic interests of creators and industries. Digital piracy not only causes financial losses but also diminishes the incentive for innovation, as creators may be reluctant to invest time and resources without assurance of protection (Walia et al., 2025).

IP laws were primarily designed for a pre-digital world, leading to ambiguities in their application to digital contexts. Jurisdictional challenges further complicate enforcement, as IP infringements often occur across borders, requiring international cooperation and harmonization of laws (Feng & Sik, 2024). Digital piracy remains one of the most persistent and damaging challenges in the quest to enhance access to intellectual property in the digital age. This not only deprives creators of rightful compensation but also undermines the incentive structures that support innovation and creative labor (Celestin, 2024).

Furthermore, the borderless nature of the internet has redefined the landscape of Intellectual property enforcement, creating significant challenges. Prior to the digital era, enforcing Intellectual property rights was largely confined to national borders, where local laws and institutions provided mechanisms for the enforcement of Intellectual property rights (Deng, 2024). However, digital content can now cross borders in seconds, with infringing content often hosted in countries with weak or incompatible legal frameworks. This creates a complex web of enforcement gaps, where owners of Intellectual property rights may find it difficult to pursue legal action against infringers of their Intellectual property rights in other jurisdictions (Azizi & Parsa, 2023). Also, the lack of harmonized legal standards means that what constitutes infringement in one jurisdiction may be considered legal in another jurisdiction, which further complicates Intellectual property protection in the digital age (Zakir & Ali, 2023).

In addition, the challenge of balancing copyright protection with the principles of fair use and open access is serious in the digital age where content consumption and sharing are central to education, research, and cultural participation (Walia et al., 2025). However, distinguishing between permissible use and infringement has become increasingly difficult. This is because digital content can be remixed, repurposed, and distributed across digital platforms at an incredible speed. Thus, the lack of clarity around these boundaries can stifle creativity and limit access to information, especially in a world driven by knowledge and access to information (Thakur, 2024).

Likewise, online platforms and digital intermediaries have become the central hubs for content distribution, making them both enablers of access and potential facilitators of intellectual property infringement. Social media platforms, streaming services, and file-sharing websites allow creators to reach global audiences with ease (Asadi, 2023). At the same time, these platforms can be used to distribute copyrighted content without permission, usually at a scale that challenges traditional enforcement mechanisms. As a result, determining the liability of these online intermediaries is a contentious legal and policy issue as there is a need to balance the need to protect IP rights with the need to preserve freedom and innovation. Thus, while overregulation may lead to censorship or the stifling of legitimate expression, under-regulation may allow piracy to flourish (Cely, 2022).

Emerging technologies such as artificial intelligence (AI), machine learning, and deepfakes introduce complex new dimensions to intellectual property management. These technologies can be used to create original works such as music, images, articles, and even software that challenge traditional notions of authorship and ownership. At the same time, they can also be used to replicate existing works without authorization, complicating efforts to detect and prove infringement. (Unnikrishnan, 2024).

For instance, AI-generated content might closely mimic a human artist's style or reproduce copyrighted material that was included in training data. This raises critical questions such as who owns the rights to AI-generated works and if machines can infringe on IP laws designed for human behavior. Current legal frameworks are ill-equipped to handle these issues, often lacking clear definitions or enforcement mechanisms for AI-related issues. Moreover, as these technologies become more accessible, the scale and sophistication of potential infringement are likely to increase. (Unnikrishnan, 2024).

Enhancing Access to Intellectual Property in the Digital Age as a Pathway to Sustainable Development

Firstly, modernizing intellectual property (IP) laws is a foundational step toward enhancing access and protection in the digital age (Adams, 2023). Traditional IP laws were conceived in an era dominated by physical media. However, in recent times, the digital environment has dramatically transformed how intellectual works are created, distributed, and protected (Klein et al., 2015).

Issues such as digital piracy, unauthorized streaming, peer-to-peer file sharing, and the rapid distribution of open-access resources present new challenges that outdated legal frameworks struggle to address. Modern intellectual property frameworks must account for the immediate nature of sharing digital content while maintaining a fair balance between protecting Intellectual property rights and ensuring public access to knowledge (Gupta, 2024).

Additionally, the digital age has dissolved physical borders, allowing digital content to move across several jurisdictions seamlessly. While the borderless nature of the internet can be helpful in ensuring access to Intellectual property in the digital era, it also complicates the enforcement of IP rights (Deng, 2024).

Therefore, strengthening cross-border enforcement is vital to ensuring Intellectual property protections in the global digital economy. This is because Intellectual property infringements might originate in one country but affect owners of intellectual property rights in another country, thereby making unilateral enforcement efforts largely ineffective. Therefore, harmonizing legal standards across countries is a practical step toward building a more cohesive global IP protection system while at the same time enhancing access to intellectual property (Feng & Sik, 2024).

In the digital age, nearly everyone is either a content consumer or content creator, whether they are uploading photos to social media, producing videos, or developing apps (George et al., 2021). Therefore, promoting digital literacy and education is an essential strategy in balancing the gap between access to intellectual property and protecting intellectual property rights (Lazariuc, 2021). Educating users about their rights and responsibilities is therefore critical in fostering respect for IP and reducing unintentional infringement. Ultimately, an informed population is more likely to support sustainable digital ecosystems where creativity thrives alongside access to knowledge and information (Lazariuc, 2021).

Likewise, adapting alternative intellectual property models is another useful strategy for enhancing access while preserving the incentives that Intellectual property protection aims to provide (Chesterman, 2025). Alternative models such as open-source licensing and Creative Commons offer a spectrum of rights that can be tailored to different contexts in the digital era. These frameworks can allow creators to maintain distribution and control over commercial use while enabling broader access to their work (Muhammad, 2023). For example, open-source software has revolutionized the tech industry by encouraging collaborative innovation, reducing costs, and enhancing the development of products. Similarly, Creative Commons licenses empower educators, researchers, and artists to share knowledge without losing their intellectual property rights (Hassan et al., 2023).

Conclusion

The digital age has irrevocably altered the landscape of intellectual property, thereby presenting both opportunities and complex challenges. The dilemma between protecting intellectual property rights in the digital age and ensuring equitable access to knowledge remains central to fostering innovation and sustainable development. The evolution of IP from physical to digital mediums has democratized creativity and distribution. However, this shift has also heightened issues such as digital piracy, jurisdictional ambiguities, and the ethical dilemmas posed by emerging technologies like artificial intelligence.

Ultimately, enhancing access to intellectual property as a pathway to sustainable development in the digital era involves striking a balance. The future of IP must prioritize not only protection but also the public good, ensuring that the digital age becomes an era of shared innovation and sustainable development for all.

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The Role of Intellectual Property in Startup Growth: Strategies for Protection and Commercialization

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Abstract

Intellectual property (IP) is a critical asset for startups, serving as both a safeguard for innovation and a catalyst for growth. This paper explores how startups can strategically leverage IP to secure competitive advantage, attract investment, and achieve long-term sustainability. In today’s knowledge-driven economy, IP not only protects startups from imitation but also facilitates commercialization opportunities such as licensing, franchising, and joint ventures. This paper also highlights the multiple contributions of IP to startup growth. For startups to maximize the value of their IP, they must adopt robust protection strategies. These include timely registration of rights, contractual agreements with employees and collaborators, encryption technologies for digital assets, and proactive surveillance mechanisms to detect infringements. Commercialization strategies such as licensing, spinoffs, and joint ventures further enable startups to monetize their IP while expanding market reach. Conclusively, this paper emphasizes the need for startups to prioritize IP management towards unlocking their full potential in competitive markets.

Keywords: Startups, Commercialization, Protection, Intellectual Property

Introduction

Startups are considered to be key drivers of innovation as their ability to disrupt existing markets and create novel solutions hinges on their unique intellectual assets (Zahra, 2024). In turn, innovation ultimately leads to the creation of intellectual property in various forms depending on the type of market and product offerings of the startup in question (Pathak and Muralidharan, 2020).

Startups are driven through the wheels of innovation and intellectual property (IP) plays a pivotal role in the growth and sustainability of startups by safeguarding these innovations. In today's knowledge-driven economy, startups rely on their intellectual property rights to protect their innovations, attract investment, and enhance their position in the markets they operate in. Therefore, effective IP management not only prevents imitation but also opens avenues for commercialization (Rani, 2025). This paper examines how startups can strategically leverage their intellectual property for growth as well as key protection mechanisms. Furthermore, it will provide key insights into the various pathways available to startups for the commercialization of their intellectual property.

Relevance of Intellectual Property to Startup Growth

According to a 2019 EPO/EUIPO study, it was demonstrated that small medium enterprises that have at least one IP right are 21% more likely to experience a growth period (European Patent Office, 2019). Therefore, it can be stated that intellectual property serves as a catalyst to the growth of startups in several ways (Beltrán-Urvina et al. 2025). Firstly, one of the key ways through which intellectual property contributes to the growth of a startup is in terms of providing competitive advantage and differentiation in the market. Specifically, IP assets such as patents or copyrights can differentiate a startup's offerings in the market, making them more appealing to investors who value unique and proprietary innovations (Grimaldi et al. 2021). Thus, intellectual property provides startups with a legal mechanism to protect their innovations, preventing competitors from copying their products or services. In turn, this will help to create barriers to entry thereby allowing startups to establish a unique position in the markets where they operate (Vaverka, 2023).

Likewise, another contribution of IP to the growth of startups is its ability to establish and protect brand identity, which is essential for fostering customer loyalty and market recognition. Trademarks, for instance, safeguard a startup's logo, name, and other distinctive elements that define its brand. Thus, by legally securing their IP assets, startups can ensure that their brand remains unique, and this prevents competitors from imitating or diluting their brand reputation (Gupta, 2024). Additionally, IP protection enhances the credibility of a startup in the eyes of investors and customers. This is because a well-protected brand fosters trust and loyalty among customers and this translates into long-term customer relationships, thereby enabling startups to build a loyal customer base. (Vaid et al. 2023).

In addition, intellectual property can help a startup with revenue generation through commercialization thereby contributing to the startup's financial sustainability. For example, licensing agreements enable startups to earn royalties by permitting other parties to use their technology which allows it to generate steady income in the process (Keogh & Johnson, 2021). Furthermore, investors often view IP as a critical indicator of a startup's potential. Therefore,

intellectual property can help contribute to the growth of startups by attracting investment and funding from potential investors (Schaberg, 2023).

Another keyway IP contributes to a startup is in terms of long-term growth and exit strategy planning. A strong IP portfolio increases startup's valuation during mergers, acquisitions, or IPOs. Acquiring firms often prioritize startups with protected IP (London, 2023). For example, Facebook's \$1 billion acquisition of Instagram, partly driven by its technology patents is a case in point (Glass & Tardiff, 2023). Additionally, IP assets can be sold or spun off into separate entities, thereby creating additional revenue streams for the startup (Nguyen et al. 2022).

Startups are vulnerable to infringement especially in very competitive markets. However, a well-documented IP portfolio can deter frivolous litigation and provide defensive protection against IP related disputes. Also, for startups looking to scale on an international level, a strong IP portfolio can help the startup achieve global expansion and enhance its protection in these global markets (Vaverka, 2023).

Furthermore, IP enhances the attractiveness of startups to potential partners by showcasing their innovative capabilities. This can lead to partnerships that amplify the startup's growth trajectory. Intellectual Property therefore acts as an asset in collaborative ventures, enabling startups to negotiate favorable partnerships and access complementary resources (Sansare et al. 2024). For example, a startup can use its trade secrets as leverage in negotiations with larger firms or research institutions to secure funding or technological resources. This is particularly important for startups competing against established players with greater resources. Thus, by leveraging their IP strategically in collaborations, startups can level the playing field and access opportunities that they would otherwise not be able to access. This would in turn contribute to the growth and development of the startup in the long run (Lubinski & Viebig, 2022).

Strategies for the Protection of Intellectual Property in Startups

There are several strategies a startup can adopt to ensure the protection of its intellectual property. One foundational way is through registration of its intellectual property rights (IPRs). This is a fundamental step for startups seeking to protect their innovations and derive economic benefits from them. Unlike copyrights, which arise automatically upon creation, other intellectual property rights such as patents, trademarks, and industrial designs require formal registration to be enforceable (Narwaria et al. 2024). By securing these rights early, startups can establish public ownership of their creations, prevent unauthorized use, and build investor confidence. Moreover, timely registration ensures that the business retains exclusive rights to exploit its innovations commercially, avoiding complications if competitors attempt to claim ownership (Mary & Enoch, 2024). While the registration process might prove to be costly in terms of effort and finances, the cost and effort involved in registering IPRs are often outweighed by the long-term advantages of safeguarding these assets (Maataoui, 2021).

Also, contractual agreements are vital tools for startups to protect their intellectual property when collaborating with employees, freelancers, suppliers, or partners. These agreements should explicitly define ownership of any intellectual property created during the engagement. Non-disclosure agreements (NDAs) can also be employed to prevent unauthorized sharing of sensitive information by employees working on IP-related projects (Iswara et al. 2024). Additionally, startups must ensure that freelancers assign all rights to the business through assignment clauses in contracts. For collaborative projects involving multiple stakeholders, detailed agreements should specify ownership rights and responsibilities to avoid future disputes. Such provisions not only protect the startup's IP but also clarify expectations and strengthen relationships with external parties (Gith, 2022).

Furthermore, the use of encryption technology can offer startups an effective method to secure their intellectual property against external threats. This strategy is particularly effective for protecting digital assets stored on servers or transmitted online. Startups can implement encryption across various platforms, including emails and databases, ensuring that only authorized personnel can access confidential information. Furthermore, encrypted systems reduce the risk of data breaches and bolsters trust among clients and investors (Vaid et al. 2023).

Also, educating employees about intellectual property rights is an essential strategy for startups aiming to minimize risks associated with IP violations. Employees who understand the importance of IP protection are more likely to comply with internal policies and avoid actions that could lead to infringement claims or loss of proprietary information. This proactive approach not only safeguards the startup's assets but also empowers employees to contribute effectively to innovation (Vaid et al. 2023).

Another way for startups to protect their intellectual property is through the adoption of Virtual Data Rooms. Virtual Data Rooms (VDRs) provide startups with a secure online platform for storing and sharing confidential information related to intellectual property. These digital workspaces allow businesses to control access permissions, ensuring that sensitive data is only available to authorized users such as investors or collaborators. VDRs are particularly useful during funding negotiations where IP documentation needs to be shared securely with potential investors (Wang, 2021).

Likewise, adopting surveillance mechanisms for monitoring intellectual property is crucial for detecting potential infringements early and taking timely action against violators. Therefore, startups should implement systems for tracking their registered trademarks, patents, or copyrights. Regular surveillance helps identify unauthorized use or counterfeit products that could harm the business's reputation or revenue streams. Therefore, by staying vigilant and responding promptly to infringements, startups can maintain control over their assets and protect their competitive advantage (Vaverka, 2023).

Lastly, developing comprehensive IP policies is another strategic move for startups seeking to govern the usage and management of their intellectual property within and outside the organization. An effective IP policy outlines rules regarding ownership rights, licensing agreements, confidentiality measures, and enforcement procedures for violations. These policies will help to serve as a framework for decision-making on matters pertaining to the startup's intellectual property (Golkowsky, 2022).

Strategies for the Commercialization of Intellectual Property as a Catalyst for Startup Growth

There are several means through which startups can engage in the commercialization of their intellectual property. Firstly, one of the ways through which a startup can recover the benefits of its innovative efforts is through assignment. Assignment involves the permanent transfer of intellectual property (IP) ownership from the original owner (assignor) to a new owner (assignee). This strategy is particularly effective for startups seeking immediate cash flow, as assignments typically involve lump-sum payments or structured payments over time (Mary & Enoch, 2024). However, a disadvantage of this is that the assignor relinquishes all rights and control over the IP, forfeiting any future benefits if the assignee successfully commercializes the asset. Assignments are most suitable when a startup needs to shut down specific operations, recover capital during insolvency, or use the IP as collateral for debt. While this approach provides immediate financial relief, startups must weigh the long-term implications of losing control over valuable IP assets (Wieser et al. 2025).

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In addition, licensing allows startups to retain ownership of their IP while granting others permission to use it under specified terms. This strategy enables startups to generate recurring revenue streams without incurring additional operational risks. Additionally, licensing enables startups to leverage the licensee's customer base and marketing efforts. Licensing offers a balanced approach for startups aiming to monetize their IP while maintaining strategic control over their IP assets (London, 2023).

Franchising is another effective strategy for startups with scalable business models and strong brand presence. Under this arrangement, the franchisor allows franchisees to replicate their business operations in new locations. The franchisee benefits from access to the franchisor's IP and operational know-how, while the franchisor gains ongoing revenue through initial fees and royalties (Dermonde & Fischer, 2023). Franchising also ensures quality control through established standards and regular assessments. For startups, franchising provides a low-risk pathway to growth while enabling market penetration through partnerships with local entrepreneurs and they can expand rapidly without significant capital investment (Dermonde & Fischer, 2023).

Furthermore, Joint ventures (JVs) involve partnerships between two or more entities that share resources, including IP, for mutual benefit while remaining independent organizations. For startups, JVs offer a faster route to market access and allows them to combine complementary IP assets with partners to tackle market challenges or innovate collaboratively (Raj, 2024). Unlike licensing agreements, JVs do not involve direct payments for IP usage but focus on shared benefits such as co-development of products or services. This strategy is particularly advantageous for resource-constrained startups looking to amplify their market presence through strategic alliances (Raj, 2024).

Lastly, spinoff is another useful strategy towards helping startups commercialize their intellectual property. It involves creating separate legal entities to commercialize a parent company's IP assets (Wiebel & Freytag, 2023). This approach is ideal for startups aiming to transform innovations into market-ready products or services while maintaining a degree of operational independence. Spinoffs allow startups to focus exclusively on developing and scaling specific innovations without diluting attention from core business activities. Additionally, spinoffs can attract targeted investments and partnerships tailored to the new entity's objectives. For startups with groundbreaking technologies or niche markets, spinoffs represent an efficient way to unlock IP value and drive growth (Wiebel & Freytag, 2023).

Conclusion

In conclusion, this paper has provided a comprehensive overview of the role of IP in startup growth and proposed practical strategies for maximizing the value of their IP assets. As the startup ecosystem continues to evolve, a deep understanding of IP management will be essential for startups to thrive in the competitive global marketplace. By embracing a culture of innovation and prioritizing IP protection, startups can unlock their full potential and contribute to the advancement of knowledge and economic development.

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The Bridge from Intangible to Indisputable: NFT Use as Evidence of Intellectual Property Ownership

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Abstract

Intellectual property law has always struggled to prove what cannot be touched. In a digital age where creation is instantaneous and reproduction effortless, the need for reliable evidence of authorship and ownership is urgent. This paper explores how blockchain and non-fungible tokens (NFTs) offer a structural solution to that evidentiary gap. NFTs are not just speculative assets; they are cryptographic records that can function as proof of title, timestamp, and chain of custody. When paired with blockchain's immutable ledger and backed by legal recognition under the Uniform Electronic Transactions Act (UETA), NFTs become powerful tools for substantiating intangible rights. By examining the mechanics of blockchain, the evidentiary requirements of IP law, and the legal recognition of cryptographic evidence, this paper proposes a framework in which NFTs serve not only as assets, but as instruments of legal fact. This framework has the potential to reshape how courts evaluate digital authorship, particularly in jurisdictions seeking to modernize evidentiary standards. Moreover, it invites policymakers and legal practitioners to reconsider the intersection of emerging technologies and traditional notions of proof.

Keywords: NFT, intellectual property, blockchain, digital ownership, smart contracts, digital rights, proof of ownership, digital evidence, ownership verification, evidence law

The Evidentiary Abyss of Intangible Rights

The intangibility of intellectual property has always made it a challenging legal construct. Without form or physicality, IP rights are uniquely reliant on legal proof and recognition in order to exist. The advent of artificial intelligence and its potential to infringe has given rise to a manifest necessity: we must revisit traditional methods of proving the existence, authorship, and ownership

of intangible assets. As we delve further into an era dominated by digital creation and reproduction, the infrastructure of evidence must evolve. Blockchain and non-fungible tokens (NFTs) offer a radical reconfiguration of how intangible rights may be evidenced, managed, and transferred.

Around 2021, NFTs gained popularity as a speculative asset. (Mattei, 2021). However, that popularity is divorced from NFTs' higher potential purpose as digital evidence of legal rights and instruments. My team is currently developing and instantiating such a reconfiguration in the form of a blockchain-driven intellectual property marketplace. (Creator Coin Collective). At the core of our innovation is a simple legal insight: mathematically verifiable evidence is afforded presumptive validity under the Uniform Electronic Transactions Act (UETA). (WestLaw, n.d.). Such evidence includes NFTs' cryptographic hashes.

The traditional struggle in intellectual property law is not in the creation of rights, but in the substantiation of those rights. Courts ask for timestamps, chain-of-title documentation, or corroborative witness testimony to determine when and by whom intellectual property was first authored in terms of copyright, reduced to practice in terms of patent, or used in commerce in terms of trademark. These evidentiary demands often exceed the practical abilities of individual creators, especially those operating independently of large institutional frameworks.

As intellectual property becomes increasingly digitized, via digital rendering, cloud storage, or virtual simulations, the means by which we prove authenticity is increasingly decoupled from traditional paper trails. (Sozio, 2017). Modern intellectual property requires proof that is tamper-evident, verifiable, and universally accessible.

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Bridging the Abyss: Blockchain as a Cryptographic Notary

Blockchain technology introduces a decentralized infrastructure in which data is time-stamped, encrypted, and immutable. (Susnjara, 2025). A unique cryptographic hash seals each transaction in a blockchain. The hash is unique because it is mathematically infeasible (to the point of near impossibility) to generate the same hash for a different transaction. The hash is immutable or inalterable without invalidating the chain.

In other words, blockchain may serve as a notary whose integrity is mathematically secure rather than institutionally trusted. The key innovation lies not in the recording of information, but in the verifiability of that record. Anyone with access to the blockchain can independently confirm the time, content, and authorship of an entry. (Susnjara, 2025)

Self-authenticating evidence holds special importance in IP law, where disputes often arise years after initial creation. (Legal Information Institute, n.d.) By using blockchain as a platform to register creative works, inventors and artists can generate an immutable timestamp that precedes any infringing act. This timestamp becomes a silent yet compelling digital affidavit.

The Load-Bearing Logic: How Blockchain and NFTs Operate

Blockchain is a sequence of data blocks in which each block contains a list of timestamped transactions and a cryptographically hashed reference to the previous block. (Susnjara, 2025). This sequence or “chain” functions as a ledger of transactions and ensures the integrity of the ledger itself. If any prior block is altered, its hash changes. This invalidates every subsequent block. Thus, a blockchain defends itself against attempts to tamper with it.

Blockchain technology relies on consensus protocols, or algorithms by which nodes in a decentralized network must agree on the current state of the ledger. (Susnjara, 2025). Such protocols ensure that no single actor can unilaterally alter the ledger without the consensus of the majority, and the protocols function to replace institutional trust.

On top of this infrastructure, NFTs are deployed as smart contracts—pieces of self-executing code that reside on the blockchain. (Campbell, n.d.) When an NFT is minted, a smart contract is created, recording not only the token’s unique identifier but also its metadata. This metadata may include the title of the work, the author’s name, a link to the asset or its hash, and any licensing terms. Critically, the NFTs’ utility lies in non-fungibility. Unlike cryptocurrencies such as Bitcoin, which are interchangeable, each NFT is singular. This singularity is what makes it apt for IP use cases: it can represent a specific artwork, invention, or symbol. The NFT becomes the vessel in which an intangible right is embedded and through which future transactions are autonomously governed. The evidentiary power of NFTs is disproportionately beneficial for intangible assets.

Physical assets can assert their uniqueness through material form. For example, a painting can be held, touched, inspected, and forensically analyzed for authenticity. The physical object is, by its very existence, its own best evidence. In such cases, an NFT may offer information on origin or supplemental verification, but the physical object remains the core proof.

Intangible assets, by contrast, have no body to show for themselves. Copyright, patent, trademark, or trade secret exist in law, not in matter. These are amorphous legal rights that float in conceptual space until tethered by documentation or testimony. When such an asset is affixed to an NFT, it gains a surrogate body. The NFT operates as a digital anchor, rendering the intangible knowable, fixed, and demonstrable. In doing so, the NFT bridges the chasm between idea and artifact, transforming legal fiction into a technical fact.

In practical terms, this means that an NFT minted for a piece of intellectual property can contain within it all of the data necessary to verify authorship, determine the scope of rights, and automate enforcement. The cryptographic hash within the metadata anchors the NFT to the work it represents, drawing the connection with evidentiary weight beyond mere reference.

The Anchors of Ownership: NFTs as Proof of Title

Non-fungible tokens extend blockchain's evidentiary potential by linking unique metadata to specific digital or physical assets. (Campbell, n.d.). Where blockchain provides a ledger, NFTs provide specificity. Each NFT contains a token ID and metadata that can include the title, author, creation date, and cryptographic hash of the underlying asset.

When an artist mints an NFT corresponding to a work, they generate not just a record of authorship but a verifiable instantiation of rights. In practice, this means that licensing, transfers, and registrations can be encoded and automated via smart contracts embedded within the NFT. The evidentiary function of NFTs is therefore twofold. It furnishes proof of existence at a point in time, and it establishes a chain of custody that is transparent and auditable.

V. Legal Footing: UETA and the Formal Recognition of Cryptographic Evidence

The Uniform Electronic Transactions Act (UETA) is a U.S. legal innovation that cements the enforceability of electronic transactions. (WestLaw, n.d.). UETA recognizes that digital records and signatures can carry the same legal weight as their physical counterparts so long as they are trustworthy and retrievable. More significantly, UETA recognizes electronically created records as valid evidence so long as they are logically associated with the signatory and are capable of being retained. Cryptographic hashes fulfill those requirements perfectly. Hashes are mathematically verifiable, logically linked to a specific object, and immutable over time. When an NFT is minted and recorded on a blockchain, it meets or even exceeds UETA's evidentiary requirements.

This alignment is non-trivial. UETA provides a clear path for a creator who registers an NFT of their work on a compliant blockchain to present that record in court as evidence of creation and ownership. The evidentiary value of that NFT does not depend on trust in a third-party platform but on the logical and mathematical integrity of the blockchain.

Crossing the Bridge: A Blockchain-Driven IP Marketplace

Our team's blockchain-based IP marketplace brings this legal architecture into practice. Here, NFTs serve as registration tools, licensing instruments, and vehicles of record. Creators upload their work, mint an NFT, and select licensing options encoded into smart contracts. All transactions from first registration to sub-licensing are logged immutably on-chain.

The interface is user-friendly, but the backend is jurisprudentially rigorous. Each NFT is paired with a SHA-256 hash of the uploaded work which is stored permanently on-chain. This hash is effectively the evidentiary signature of the work. Coupled with metadata including author identity, title, and creation date, the NFT becomes a dossier of authorship.

By ensuring that each record conforms to UETA standards, the marketplace renders every transaction courtroom-ready. We envision a future in which a creator need not rely on declarations,

cease-and-desist letters, or third-party middlemen. Instead, creators may present a simple blockchain record that speaks louder than any affidavit.

Structural Stressors: Legal and Practical Challenges

Despite its promise, the blockchain-NFT framework is not without friction. The challenges to adoption are doctrinal, technical, and cultural.

Doctrinally, courts remain more comfortable with traditional paper documents than with cryptographic records. (Tysver, n.d.). Although UETA provides a legal basis for cryptographic records, courts vary on the level of confidence they will give such records. Smart contracts may not be considered controlling over paper documents, and courts may disregard the terms of a smart contract's self-executing code due to equitable considerations.

NFTs' reliance on off-chain storage and consensus protocols poses threats from a technical perspective. (Tysver, n.d.). If an NFTs' off-chain storage disappears, the evidentiary link between an NFT and its underlying asset could be severed. Furthermore, although blockchains are designed to be tamper-resistant, they are not immune to certain attacks that would allow a bad actor to manipulate information stored on a blockchain. One such attack is a 51% attack where a bad actor seizes over 50% of the nodes required to satisfy a blockchain's consensus protocol. (Coinbase, n.d.).

Finally, widespread adoption heavily depends on understanding. Without broader legal and technical fluency, even mathematically sound evidence may be misinterpreted or disregarded. The tools with which legal systems can modernize evidentiary proceedings are there, but legal systems may not be culturally prepared to accept such modernization.

The Paradigmatic Shift in Evidentiary Weight

The trajectory is clear. As digital creation continues to outpace traditional legal systems, the need for verifiable, tamper-resistant proof grows ever more urgent. Blockchain and NFTs are not panaceas, but they are formidable tools that can equip individual creators with the same evidentiary muscle as centralized institutional methods.

Legal systems must evolve to meet this new terrain. Just as paper gave way to electronic records, courts must become comfortable with cryptographic proofs. Legislators must recognize blockchain registries as functional analogs to traditional methods of common law documentation. Creators have a unique opportunity to control how their IP is created, claimed, and transacted.

In a world where ownership can be copied, claimed, and corrupted, the best defense is certainty. Blockchain, paired with NFTs and validated under laws like the UETA, offers a new evidentiary language in the form of hashes and timestamps. We must not underestimate the

significance of this technological and jurisprudential shift. Blockchain does not replace IP law; it refines it. It empowers the individual to assert their rights with incontrovertible mathematical proof. And in the courtroom, proof is power.

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Bridging the Gap: How IP Frameworks Can Support Underrepresented Entrepreneurs in the Digital Economy

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Abstract

In the rapidly evolving digital era, the nature of Intellectual property (IP) rights is undergoing unprecedented transformation. New technologies—blockchain, artificial intelligence, and decentralized platforms—are revolutionizing how IP is created, protected, and monetized. This article explores the shifting legal landscape, highlights challenges facing underrepresented creators, and outlines innovative models, including Software-as-a-Service (SaaS) solutions and IP-as-a-Service (IPaaS), to democratize IP access and empower emerging entrepreneurs. Drawing upon real-world experience building a legally compliant, blockchain-enabled licensing platform, the author offers insight into future policy frameworks and practical pathways to equity and global value creation.

Keywords: Intellectual Property, Blockchain, IP-as-a-Service, Access to Justice, Digital Licensing, Artificial Intelligence, IP Rights, SaaS, Legal Technology, Innovation Equity

Introduction

The digital revolution has disrupted every sector of society, including the very foundations of Intellectual property law. Traditional IP systems, while rooted in centuries of jurisprudence, are ill-equipped to address the nuances of machine-generated content, decentralized authorship, and transnational enforcement. For IP to retain its relevance and purpose—protecting creativity, incentivizing innovation, and enabling commercialization—law, technology, and equitable access must converge.

I. The Role of Emerging Technologies

Blockchain technology enables immutable, time-stamped records of ownership, and smart contracts automate licensing terms without intermediaries. This presents a radical shift in IP administration—from registration to enforcement—reducing friction and costs. Artificial intelligence, meanwhile, brings both opportunity and disruption. Generative AI creates original works that challenge the legal frameworks around authorship and ownership. Courts and policymakers now face the question: who owns AI-generated work, and how should liability or moral rights be interpreted in this context? Smart contracts further offer autonomous execution of licensing and royalty agreements. With no intermediary, creators can receive micropayments instantly and globally. However, technical literacy and platform interoperability remain significant adoption barriers, especially in lower-income or less connected regions.

II. Challenges Facing Underrepresented Creators

Marginalized entrepreneurs face systemic barriers in accessing IP rights and legal resources. These challenges stem not only from economic exclusion but also from cultural, educational, and geographic marginalization. Traditional IP protection mechanisms are slow and expensive, requiring formal applications, expert guidance, and ongoing monitoring—all of which disproportionately burden creators without institutional support. Through pro bono legal services, accelerator programs, and software innovation, the author's ventures have addressed this equity gap directly. For example, T-I-L® developed an IP-as-a-Service platform offering integrated copyright registration, blockchain timestamping, and license distribution. Coupled with education and community building, the approach has empowered creators in the U.S., Ethiopia, and Vietnam to commercialize work and attract investment. Global policy frameworks also emphasize inclusion. UN Sustainable Development Goal #9 promotes industry, innovation, and infrastructure, while Goal #10 calls for reducing inequality within and among countries. Bridging IP inequity directly contributes to these priorities.

III. Case Study: T-I-L® Technology-Innovation-Law, LLC

Founded in Washington, D.C., T-I-L® operates at the intersection of social impact, legal innovation, and digital entrepreneurship. It is a social impact Intellectual property focused law practice that designed a digital service solution model. Since its inception, T-I-L® has served over 100 creators, including musicians, designers, app developers, and small business owners. Using its digital services model these clients have created over \$43MM in cumulative estimated value by protecting and commercializing and monetizing their works. In many instances, the value creation was witnessed through increases in operating profits or market-priced asset sales.

Originally developed through research funded by the National Science Foundation's I-Corps Program, the firm's digital service model blends IP and legal services with innovation to reach a wide demographic such as 95% people of color, 60% women, and 50% small business or startup founders, including creatives and social impact entrepreneurs. Clients range in age from 7 to 67, with educational and economic backgrounds spanning from elementary school to graduate education, and from public housing to the middle class. Services cover traditional IP (e.g., copyright, trademarks, trade secrets, and pro se patent support) as well as emerging areas like data rights and name/image/likeness protection. Insights from this work led to the creation of T-I-L-Group, Benefit Corp. (dba "IPRights4All™") in 2024, a mission-driven spinout aimed at scaling access to IP protection for all.

IPRights4All™ has launched its minimum viable product and is going to market with learning from test and paid pilot clients. Its benefit corporation model mission is to democratize Intellectual property rights for under-served communities by making it easier and less costly for them to protect and monetize their innovation. The initial focus is on Copyrights in this phase of launch – with an eye toward including other forms of IP where it makes sense for its mission. The business model is to be a support for end users and their allies, for example attorneys, to complement licensed legal services and proprietary SaaS technology open standards, including blockchain for tamper-proof licensing.

Collectively, Technology-Innovation-Law and IPRights4All have been recognized by NASDAQ's Milestone Makers, 1863 Ventures, African Diaspora Network, Georgetown Venture Lab, University of Maryland Blockchain Accelerator, Smart City Works Actuator. The IPRights4All™ Software as a Service technology model incorporates privacy-by-design principles, machine-readable licenses, and hybrid dispute resolution (including AI-assisted mediation), making it a vehicle for adapting to next-generation IP policies and systems. It is supported by research from the National Science Foundation's I-Corps program, linking academic insight with entrepreneurial implementation.

IV. Emerging Market Impacts

Currently global policy, non-state and state actor violence, and technology shifts are contributing to a challenging environment for Intellectual property. Yet there are four emerging opportunities that exemplify salient reasons to continue the work toward democratization. They are:

- **\$1 trillion of additional annual gross domestic product growth** - in the US alone, from expanding the diversity of entities contributing to intellectual property, with comparable value for other countries. ("Diversity data reveals the size of missed opportunities in inventors and patenting," n.d.).

- **Diversion to peace and commerce from violence and war** – the United States Institute of Peace and other entities recognize that economic opportunity may reduce ("path to public safety requires economic opportunity: Trends and solutions in urban, suburban, and rural communities," 2025).

- **Innovation leverage through digital inclusion** - valuation of IP focused startups like Story Protocol show that an \$80 million investment may produce a \$2 billion valuation.

- **Contribution to the United Nations Sustainable Development Goals** – innovation is democratic and individual, by its human nature, empowering organizations, and people to produce unique local solutions that have potential for other parts of the world. At this moment of global stressors, it is imperative that we source and share local ideas that can generate global solutions. (Lunden, 2024).

There are win-win-win reasons to support the progress and resilience of Intellectual property rights as we lurch into the next phases of the digital society. The creators and inventors retain economic and personal happiness opportunities. Communities and governments should benefit from public service cost avoidance or reduction and tax inflows. The world realizes a relatively untapped source of ideas to complement established innovators.

V. Legal and Regulatory Implications

As innovation outpaces regulation, legal frameworks must evolve. Key areas needing reform include:

- Definition of Authorship: Legal systems must address the status of AI-generated content and the concept of joint human-machine authorship.
- Smart Contract Recognition: Jurisdictions differ in whether smart contracts are enforceable under existing contract law.
- Global Interoperability: Cross-border IP enforcement is inconsistent and often favors well-capitalized entities. Harmonization of digital IP rights and recognition of decentralized identifiers is essential.
- Safe Harbors for Innovation: Developers of platforms that support IP creators should be protected from secondary liability, encouraging open collaboration.

Furthermore, education is crucial. Creators need access to legal literacy, especially in rapidly evolving fields like NFTs and digital collectibles. Law schools, bar associations, and policy institutes must accelerate curricular reform to prepare future lawyers for digital IP stewardship.

Conclusion

The future of IP in the digital age demands a paradigm shift. It is not only about adapting existing legal frameworks—it is about rethinking access, participation, and global equity. By embedding IP tools within accessible, affordable, and secure digital environments, innovators from all backgrounds can thrive. T-I-L® and similar ventures demonstrate the feasibility of this vision. They exemplify how technology, law, and entrepreneurship can converge to democratize ownership, monetize creativity, and enhance inclusion. With intentional investment, collaborative policymaking, and bold experimentation, we can build an IP system fit for the digital age.

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