

# THE EVOLUTION OF INTELLECTUAL PROPERTY LAW IN THE DIGITAL AGE

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#### ABSTRACT

The digital age has profoundly transformed the landscape of intellectual property (IP) law, reshaping how rights are defined, enforced, and contested across global jurisdictions. With the exponential growth of digital platforms and the increasing sophistication of artificial intelligence (AI), traditional legal frameworks are being tested in unprecedented ways. This article explores the evolution of IP law in response to technological disruptions, examining the legal implications of digital content creation, algorithmic innovation, and AI-generated works. Through a multi-faceted exploration of copyright, trademarks, and patents, the article highlights how digital piracy, data-driven inventions, and online brand misuse are challenging conventional understandings of ownership, authorship, and infringement. Particular attention is paid to the legal and ethical questions surrounding AI as both a creator and user of intellectual property, probing the tension between automation and human creativity. Case studies from jurisdictions such as the United States and India provide a comparative lens into how courts and lawmakers are responding to these challenges. Notable legal developments such as intermediary liability for digital platforms, software patentability, and the classification of machine-generated content are analysed in depth. The article argues for a reimagining of IP regimes that not only accommodate digital innovation but also safeguard the rights and interests of a diverse range of stakeholders. Ultimately, the piece calls for forward-looking legal frameworks that embrace global cooperation, clarity in attribution and enforcement, and a balanced approach to innovation and protection. By situating legal doctrine within the rapidly evolving digital context, the article contributes to the ongoing discourse on how best to future-proof intellectual property systems in an AI-driven world.

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## **INTRODUCTION**

Intellectual property (IP) laws exist to protect the creations of the mind and provide incentives for innovation and creativity. With the emergence of digital technologies and artificial intelligence (AI), the boundaries and applications of these laws have been challenged like never before. The internet has enabled widespread dissemination and reproduction of content, while AI systems are increasingly capable of generating creative works independently. This paper explores how IP law, particularly in the domains of copyright, trademark, and patents, is evolving to meet these technological disruptions.<sup>1</sup>

## HISTORICAL CONTEXT OF INTELLECTUAL PROPERTY LAW

Copyright Law Origin: The foundation of modern copyright law can be traced back to the Statute of Anne (1710), the first statute to provide authors with exclusive rights over their work. Over the centuries, the scope of copyright expanded to include various forms of creative expression, such as music, films, and software. In the U.S., the Copyright Act of 1976 marked a significant evolution, aligning national law with international treaties such as the Berne Convention.

Trademark Development: Trademarks serve as source identifiers that distinguish goods or services. The U.S. Lanham Act (1946)<sup>2</sup> laid the groundwork for modern trademark law by establishing procedures for registration and enforcement. Trademarks have since evolved from physical labels on products to encompass virtual branding elements such as website domain names, hashtags, and logos in digital environments.

Patent Law Foundations: Patent law, enshrined in the U.S. Constitution and further developed through the Patent Act of 1952, grants inventors exclusive rights to their inventions. The requirements of novelty, non-obviousness, and utility remain key. As technology has advanced, software patents and biotech inventions have tested the adaptability of these traditional requirements.

<sup>&</sup>lt;sup>1</sup> U.S. Copyright Office (2022). Policy Statement on Copyright Registration of Works Containing AI-Generated Content. <sup>2</sup> U.S. Patent Act (1952); Lanham Act (1946).

#### THE DIGITAL REVOLUTION AND IP

**Digital Content Proliferation:** Digital media can be copied and distributed effortlessly, which poses a significant challenge to copyright enforcement. Peer-to-peer sharing networks like Napster and torrent sites like The Pirate Bay facilitated mass copyright infringement, prompting lawsuits and legislative responses such as the Digital Millennium Copyright Act (DMCA) of 1998<sup>3</sup>.

**The Challenge of Enforcement:** The global and decentralised nature of the internet complicates jurisdictional enforcement. Content creators struggle to protect their rights against infringers operating from foreign jurisdictions. The DMCA's takedown mechanism has been widely used, but it is reactive rather than preventive and can be abused.

**Online Branding and Trademarks:** Digital platforms like Amazon, Instagram, and TikTok have become essential marketing channels. This shift has led to new forms of brand infringement, including impersonation and counterfeit goods sold on e-commerce platforms. Trademark owners are increasingly using automated systems to detect and report violations, though these tools may miss context or legitimate fair use.

**Software and Algorithm Patents:** The patentability of software has been contentious. The U.S. Supreme Court's decision in Alice Corp. v. CLS Bank International, 573 U.S. 208 (2014)<sup>4</sup>, established a two-part test for determining patent eligibility of abstract ideas, impacting many software and algorithm-based inventions. Despite this, tech firms continue to secure patents for AI algorithms and applications.

## AI AND THE NEW FRONTIER OF IP

**AI-Generated Works:** AI systems such as OpenAI's GPT, DeepMind's AlphaCode, and visual generators like Midjourney are capable of producing works that resemble human-created content. However, current laws often require human authorship. The U.S. Copyright Office reaffirmed this in 2022 by denying protection to AI-generated art lacking human authorship.

**AI as a Tool in IP Management:** AI tools are also transforming IP management, from detecting plagiarism and counterfeit goods to predicting patent litigation outcomes. Companies

<sup>&</sup>lt;sup>3</sup> Digital Millennium Copyright Act (1998).

<sup>&</sup>lt;sup>4</sup> Alice Corp. v. CLS Bank International, 573 U.S. 208 (2014).

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like IBM and Clarivate offer AI-powered patent analytics tools that help examiners and attorneys assess novelty and prior art more efficiently.

**Patentability of AI Inventions:** The debate continues over whether AI can be listed as an inventor. Dr. Stephen Thaler's DABUS AI system, which filed patent applications in multiple jurisdictions, was rejected in the U.S. and UK but accepted in South Africa and Australia (later overturned). The U.S. Federal Circuit ruled in Thaler v. Vidal (2022)<sup>5</sup> that only natural persons can be inventors under current law.

# **INTERNATIONAL PERSPECTIVES**

**WIPO and Global Harmonisation:** The World Intellectual Property Organisation (WIPO) is actively working on frameworks to address AI and digital content issues globally. Its "WIPO Conversation on IP and Frontier Technologies" brings together stakeholders to discuss policy alignment and best practices.

**Jurisdictional Divergences:** The EU has implemented the Digital Services Act and Digital Markets Act to improve online enforcement and transparency. By contrast, the U.S. relies on a more decentralised enforcement regime with broader fair-use provisions. Meanwhile, China has established specialised IP courts and heavily invests in AI-driven IP infrastructure, filing more AI-related patents than any other country.

#### LEGAL REFORMS AND PROPOSALS

**Copyright Reforms:** Scholars advocate for recognising AI-assisted creativity, establishing new licensing models for digital distribution, and refining the fair use doctrine. For instance, the EU's Directive on Copyright in the Digital Single Market (2019) includes provisions for text and data mining exceptions, balancing creator rights and technological development.

**Trademark Innovations:** The USPTO and EUIPO are exploring automated dispute resolution mechanisms and digital authentication technologies (e.g., NFTs for trademark authentication). There is also a need to clarify the scope of brand use in metaverses and virtual environments.

Patent System Evolution: Patent offices must adapt to inventions partially or wholly generated by AI. Proposed solutions include attributing AI-generated inventions to human

<sup>&</sup>lt;sup>5</sup> Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022).

operators or creating new forms of protection tailored to machine inventions. Procedural changes, such as enhanced examination methods using AI, are also being discussed.

#### ETHICAL AND PHILOSOPHICAL CONSIDERATIONS

**Creativity and Ownership:** The core question is whether machines can be considered authors or inventors. Philosophically, creativity has long been seen as a uniquely human trait involving intention and expression. Assigning authorship to AI challenges this notion and may dilute the meaning of ownership and moral rights.

**Equity and Access:** The concentration of IP in the hands of large tech companies may exacerbate inequalities. Open-source movements and Creative Commons licensing offer alternatives that promote broader access and innovation. Policy frameworks should support both proprietary and open systems.

## **CASE STUDIES**

**The Google Books Project:** This long-running legal battle over Google's book digitisation project (Authors Guild v. Google Inc.)<sup>6</sup> culminated in a 2015 ruling affirming fair use. The court held that the project transformed the original texts and served a public benefit, highlighting the need to adapt copyright to the digital era.

**DeepMind and Healthcare Patents:** DeepMind's AI collaborations with NHS hospitals have produced innovations in diagnostics and treatment. Patent applications from such projects raise questions about data ownership, privacy, and the commercialisation of public health research.<sup>7</sup>.

**TikTok and Music Licensing:** TikTok's model of short-form music-backed videos has strained traditional music licensing frameworks. Deals with major record labels have created a new licensing paradigm, but disputes over royalties and content use continue.

## INDIAN CASE LAWS ON DIGITAL IP

Super Cassettes Industries Ltd. v. MySpace Inc. (2011):<sup>8</sup> In this case, the Delhi High Court addressed copyright infringement on social media platforms. Super Cassettes, a major Indian music label, accused MySpace of allowing users to upload infringing content. The court

<sup>&</sup>lt;sup>6</sup> Authors Guild v. Google, Inc., 804 F.3d 202 (2d Cir. 2015).

<sup>&</sup>lt;sup>7</sup> DeepMind Health Research Publications.

<sup>&</sup>lt;sup>8</sup> Super Cassettes Industries Ltd. v. MySpace Inc., 2011 (48) PTC 49 (Del).

highlighted the platform's obligation to remove content once notified, aligning with safe harbour principles similar to those in the DMCA.

**Tata Sons Ltd. v. Greenpeace International (2011):**<sup>9</sup> This case dealt with trademark dilution and parody. Greenpeace created a game that criticised Tata's environmental practices, using the Tata logo. The Delhi High Court held that parody could be protected under the right to free speech, setting a precedent for balancing trademark rights with digital expression.

**Christian Louboutin SAS v. Nakul Bajaj & Ors. (2018):**<sup>10</sup> Here, the Delhi High Court examined intermediary liability for e-commerce platforms under Indian IP law. The court ruled that online marketplaces may be liable if they actively promote or control the sale of infringing goods, impacting how digital platforms manage IP compliance.

**Ferid Allani v. Union of India (2019):**<sup>11</sup> This case focused on software patentability in India. The Delhi High Court emphasised that computer-related inventions should not be automatically excluded from patentability and ordered a re-evaluation of the patent application. This ruling encouraged a broader interpretation of technical contribution in digital innovations.

# FUTURE DIRECTIONS LOOKING AHEAD, IP FRAMEWORKS MUST EVOLVE TO

- Recognise hybrid human-AI authorship and develop appropriate attribution rules.
- Establish global treaties specifically addressing digital and AI-generated content.
- Improve international enforcement cooperation, especially in cross-border piracy and counterfeiting.
- Develop new categories of IP protection suited to non-traditional creators.

## CONCLUSION

As the digital age continues to evolve at an unprecedented pace, so too must the legal systems designed to protect intellectual property. The integration of artificial intelligence, the proliferation of digital content, and the global nature of information exchange have not only expanded the scope of intellectual property rights but also introduced significant regulatory challenges. Copyright, trademark, and patent laws, once rooted in tangible, human-made

<sup>&</sup>lt;sup>9</sup> Tata Sons Ltd. v. Greenpeace International, 178 (2011) DLT 705.

<sup>&</sup>lt;sup>10</sup> Christian Louboutin SAS v. Nakul Bajaj & Ors., 2018 SCC OnLine Del 13010.

<sup>&</sup>lt;sup>11</sup> Ferid Allani v. Union of India & Ors., 2019 SCC OnLine Del 11837.

creations, must now accommodate intangible, machine-generated, and algorithmically enhanced works that defy traditional legal categorisation.

One of the central tensions in this evolving landscape is the need to balance innovation and access with the protection of creators' rights. AI systems are increasingly involved in both the creation and analysis of IP, making it imperative to rethink authorship, ownership, and liability frameworks. Moreover, digital platforms have altered how content is distributed and monetised, creating new avenues for infringement but also novel opportunities for expression and collaboration. The examined case studies, both international and Indian, underscore the importance of context-sensitive legal adaptations. From the U.S. judiciary's nuanced interpretation of fair use in the Google Books case to India's progressive stance on software patentability and intermediary liability, it is evident that courts are gradually acknowledging the distinctiveness of digital-era IP disputes. These decisions point to a broader trend where judicial systems are tasked with interpreting outdated statutes in technologically sophisticated scenarios, often filling legislative gaps with innovative judicial reasoning.

Looking forward, intellectual property law must not only adapt but proactively anticipate technological disruptions. This includes fostering global cooperation for enforcement, developing clear standards for AI-generated content, and ensuring that the rights of both traditional and non-traditional creators are respected. Legal reforms should also prioritise inclusivity, ensuring that smaller creators, startups, and developing nations are not left behind in the rush to protect and commercialise IP.

The transformation of intellectual property law in the digital age is both a challenge and an opportunity. It is a challenge because it compels legal systems to evolve rapidly, often in uncertain and contentious directions. Yet, it is also an opportunity to build a more equitable, efficient, and forward-looking legal infrastructure that encourages creativity, rewards innovation, and supports a diverse range of stakeholders in the global digital ecosystem. As the interplay between law, technology, and society deepens, intellectual property law must remain dynamic, principled, and responsive to the ever-changing contours of the digital world.