
INTELLECTUAL PROPERTY RIGHTS IN THE DIGITAL ERA: CHALLENGES OF ARTIFICIAL INTELLIGENCE, COPYRIGHT, PATENTS AND ONLINE INFRINGEMENT

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Abstract

The digital era has changed intellectual property (IP) from a system largely addressing identifiable human creators, territorial markets and discrete acts of copying, to a legal field challenged by automated creation, data-intensive machine learning, global platforms and near-frictionless reproduction. The rise of AI – in particular, generative AI – brings existing tensions in copyright and patent law to the boil. The copyright law must set out when the output of a machine-assisted system is considered human-authored to a sufficient extent. It must also clarify whether using a protected work in the training of a model constitutes reproduction for purposes of copyright law. Further, the law must specify in which cases exceptions, for example, fair dealing or fair use, will apply. Finally, it must determine how civil liability should be attributed in case a system outputs substantially similar or infringing material. Patent law needs to consider the creation of AI-assisted invention, whether a human inventor is required, the patentability of computer-related inventions and the quality of disclosure. Infringement online remains a major enforcement problem. This is because unauthorized copies can be hosted, mirrored and redistributed at scale across borders. In the study, Indian law has been examined alongside important developments of the USA, the U.K, European Union and European Patent Office using a doctrinal and comparative method. It analyzes Copyright Act, 1957, Patents Act, 1970, Information Technology Act, 2000 and important cases including *R.G. The case of Anand v. Deluxe Films*, *Eastern Book Company v. D.B.* bears relevance to the present case. The legal disputes in these cases include *Modak v. MySpace*, *UTV v. 1337X*, *Ferid Allani v. Union of India* and *ANI Media v. OpenAI*. A comparison of International decisions namely *Thaler v. Perlmutter*, *Thaler v. Comptroller-General* and EPO DABUS decisions. As discussed here, the key policy task is not between maximal innovation or maximal control by right holders, but rather the establishment of a clear framework for human-centred authorship, of proportionate licensing, technically realistic patent standards, narrow and effective intermediary obligations and high-quality remedies against commercial piracy.

Keywords: artificial intelligence; copyright; generative AI; patents; computer-related inventions; online infringement; intermediary liability; dynamic injunctions; digital piracy; intellectual property.

1. Introduction

The development of intellectual property law had always been jurisprudential in a response to technological change. In other words, the ways the media is made and the means by which it gets developed are important. The current transformation differs in magnitude, as digital networks and artificial intelligence can jointly automate the creation and global dissemination instantly. To copy, index, stream, and redistribute what you have found can be achieved in seconds, thanks to the power of digital platforms. machine learning systems can be trained on the humongous collection of text, images, music, software and audiovisual material. As noted in WIPO (2019, 2020), these developments may increase the long-standing challenge of balancing incentives for creators/inventors with access, competition, research and technological development.

India has many laws covering many aspects of IPL, however it provides no clarity as to the impact of generative AI yet. The Copyright Act of 1957 provides for the protection of original literary, dramatic, musical and artistic works, cinematograph films and sound recording. It also provides for the right to reproduce, communicate to the public, and adaptation of such works. The Act has a special provision for some computer-generated works – Section 2(d)(vi) states that the person who causes the work to be created is the author. The Patents Act, which was enacted in 1970 by India, protects inventions connected with a process, product or improve that satisfies novelty, inventive step and industrial applicability. However, it does not protect mathematical or business method, a computer programme *per se* and also algorithms under section 3(k) (The Government of India, 1957, 1970). The provisions one must work under today relate to computer programs that may create expression; optimize a technical system; suggest a chemical structure; contribute to the making of the inventive.

The digital environment also modifies infringement. In the physical sphere, the enforcement has mostly been on a producer or publisher or some physical distributor. The uploaders, cyberlockers, social-media platforms, search engines, hosting providers, domain registrars, content-delivery networks, payment processors and internet service providers are also potential targets of infringement. In response, Indian courts have laid down standards on intermediary safe harbour, specific knowledge, blocking of websites and dynamic injunctions (*MySpace Inc v Super Cassettes Industries Ltd*, 2016; *UTV Software Communication Ltd v 1337X.to*, 2019). These developments indicate that the definition of exclusive rights is as vital as the procedural architecture for IP enforcement.

Before 2023, questions surrounding copyright, patent and platform-law were brought together by Artificial Intelligence. Developers needed a lot of data, creators wanted control and remuneration, users wanted access to new computational tools, and governments increasingly examined the effect of AI on existing intellectual-property rules. WIPO's international consultation identified by 2020 authorship, ownership, training data, inventorship and patentability as key policy questions, whereas courts in several jurisdictions were addressing whether an AI system can be legally labelled as inventor (WIPO, 2020; EPO, 2022; *Thaler v.*



Vidal, 2022). The status remained confusing, especially since the copyright and patent statutes were mostly written on the assumption of human authors and creators.

2. Objectives and Research Questions

1. To explain how digital technologies and generative AI challenge conventional concepts of authorship, inventorship, copying and infringement.
2. To analyse Indian copyright law relating to AI training, AI-generated outputs, originality, substantial similarity, fair dealing and online dissemination.
3. To examine patent-law issues involving AI-assisted invention, human inventorship and computer-related inventions under section 3(k) of the Patents Act, 1970.
4. To evaluate intermediary liability, safe harbour, notice-and-takedown practice, website blocking and dynamic injunctions against online piracy.
5. To compare Indian developments with influential approaches in the United States, United Kingdom, European Union and European Patent Office.
6. To propose reforms that protect creators and inventors while preserving competition, research, user rights and responsible AI innovation.

3. Research Methodology

The study utilizes a variety of research methods in law. The Constitution of India, the Copyright Act 1957, the Patents Act 1970, the Information Technology Act 2000, rules made thereunder and reported judicial decisions. The Supreme Court and High Courts of India have made decisions which are used to locate controlling or persuasive principles. Sources of comparison may include cases and materials published officially by the USA, England, EPO and EU institutions prior to 2023. Books and WIPO papers are examples of secondary materials. The research deliberately confines its information, authorities, citations and references to items available on or before 31 December 2022 so that subsequent developments do not affect the analysis.

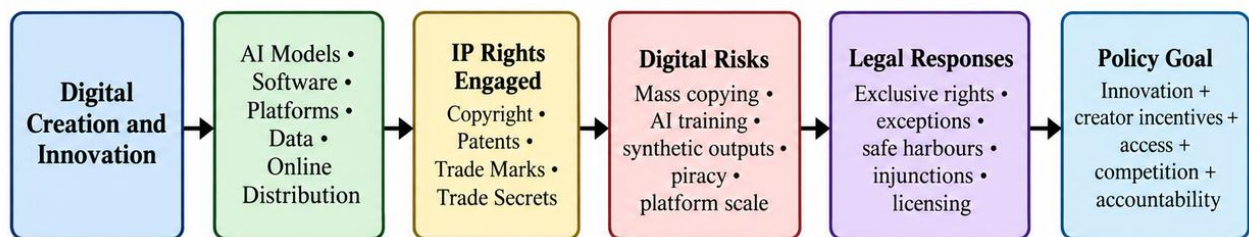
4. Digital Transformation of the Intellectual Property System

The rationale behind intellectual property must be in equilibrium. The exclusive rights must reward investment in creative and inventive activity. Limitations, finite terms, disclosure obligations and public-domain rules are also crucial to prevent exclusives rights from becoming permanent barriers to learning and competition (Landes & Posner 2003; Lemley 2015). The growing importance of radio as an international medium of communication has led to an upsurge of interest in frequencies in many parts of the world. While developing countries are not primarily interested in renewals of existing short-wave frequencies, the countries controlling those frequencies should be prepared to give up the past rather than endanger the future. Caching, indexing, tokenisation, cloud synchronisation, model training all involve temporary or permanent copies. Their technical role may differ from their legal significance.

AI introduces another layer, as it does not purely disseminate a final product; instead, as we will see, it modifies input data into statistics and generates a new product. The legal analysis must therefore break down the acquisition of training materials, the storage and preprocessing

of training data, the training of models, and the generation of outputs. If you treat all the stages as one act, you may lose your rights and exceptions. Before 2023, various scholarship and policy consultations already recognized the fact that machine learning may involve reproductions of protected material, and at which point the law will still have to determine whether those computational uses fall within an exception, license or infringement (WIPO, 2020; Guadamuz, 2017).

Figure 1. Digital-Era Intellectual Property Ecosystem
Digital-Era Intellectual Property Ecosystem



Source: Author's conceptual synthesis based on copyright, patent and platform-law principles.

5. Copyright in the Age of Artificial Intelligence

5.1 Originality, Human Authorship and Computer-Generated Works

Copyright protection begins with something protected work. The Indian originality doctrine links with *Eastern Book Company v. D.B. In Modak* (2007), the Supreme Court rejected a purely mechanical sweat-of-the-brow standard and required creative input involving skill and judgment. R.G. The case of *Anand v. Deluxe Films* (1978) remains central to infringement analysis as it distinguishes the unprotectable nature of ideas, themes and facts from expression and emphasizes upon copying which must be substantial and material. The cases that have come before the courts in India are instructive. You can't monopolize facts, style, themes and general ideas, but a sufficiently original human expression embodied in a work can be protected. (*Eastern Book Company v. D.B. Modak*, 2007; *R.G. Anand v. Deluxe Films*, 1978).

India has a unique legal provision under section 2(d)(vi) of the Copyright Act, which in relation to a computer generated literary, dramatic, musical or artistic work refers to the person who causes the work to become. The provision is outdated considering modern generative AI, hence does not answer any question currently. It might include works where software has been brought into play with considerable human direction, but harder cases arise where the model independently determines most expressive elements after a short prompt. The identity of the user, developer, commissioning party or other actor may be identified according to factual control through the term "causes the work to be created." A wide reading that grants ownership to anyone who inputs a prompt could lead to excessive monopolies over outputs that involve little human creativity (Guadamuz, 2017; Ginsburg & Budiardjo, 2019).



Before 2023, the United States was very much human-centered in its approach to copyright authorship. Copyright is there to protect the results of intellectual labour that are seeded in creative powers of the human mind. Works produced by the nature, animal or machines without sufficient human authorship are not registrable. All this is according to the Compendium of U.S. Copyright Office (U.S. Copyright Office, 2021). Many cases, such as *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884) and *Naruto v. Slater*, 888 F.3d 418 (9th Cir. 2018), emphasize human creativity as a basis of copyright. The Indian courts are not bound by these authorities. However, it would be useful to refer to them as a comparative distinction between the use of AI as a tool for creation vs the use of an autonomous system as the author.

5.2 AI Training, Reproduction and Fair Dealing

Creating machine learning systems poses a complicated copyright issue as a copy is usually needed for computation analysis. Downloading, cleaning, indexing, tokenising or otherwise processing the works. According to section 14 of the Copyright Act in India, reproduction right consists of, among other things, the right to store the entire copyrighted material in an electronic form. The Act states that the technical act of reproduction may matter in law. Before 2023, India had no specific ruling on whether copyright law was violated by training.

The nearest guidance on what can be considered comparably relevant was from the text-and-data-mining debates, search-engine cases and policy studies of whether computational analysis ought to be licensed or treated as an exception (Government of India, 1957; *Authors Guild, Inc. v. Google, Inc.*, 2015; WIPO, 2020).

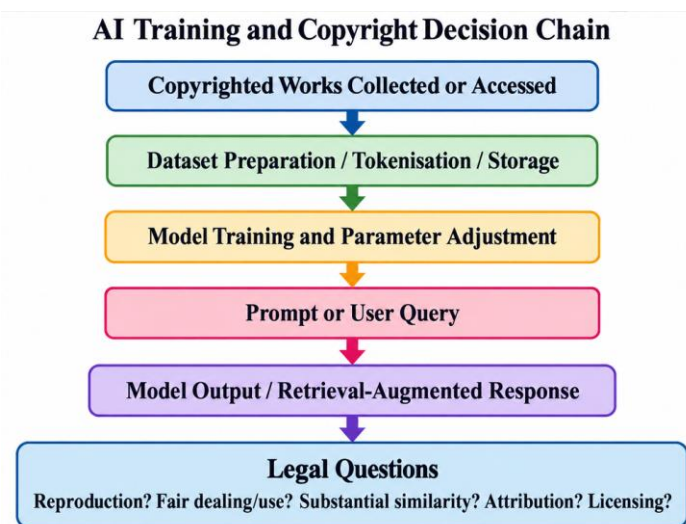
The lack of judgment pertaining to Indian generative-AI training prior to 2023 required an analysis from settled doctrine. The Copyright Act protects reproduction rights while section 52 provides specified exceptions including fair dealing for specified purposes. Whether large-scale machine learning could fit an existing exception depends on the interpretation, purpose, extent and nature of copying, and potential market effects. Thus, Indian law prior to 2023 offered principles, not an answer. Given the uncertainty, there is a strong case for legislative or policy clarification and not for assuming that all training is automatically lawful or automatically infringing.

ANI Media uses a process to get around the India restrictions. Instead of adjudicating on the legality of all AI training, the Court separated reproduction from exception. You'd prefer this analytically because section 52 is meant to mediate exclusivity versus permission. Still, the ruling is incidental and fact-specific. Upcoming lawsuits may relate to paywalled databases and licensed archives; actual circumvention of technical restrictions, professional datasets or output that crowd the source market. These variations could significantly impact the fairness assessment. This means that it would be hard to justify the categorical rule on the label AI training.

Before 2023 different approaches appeared in comparative law. The fair-use doctrine in United States law was open-ended, and *Authors Guild v. Google* established that in this particular factual situation, mass digitisation for search and for text analysis is transformative (*Authors*

Guild, Inc. v. Google, Inc., 2015). According to Directive (EU) 2019/790, the EU included specific text-and-data-mining exceptions as well as a broader rights-reserved exception (European Union, 2019). The UK maintained a narrower exception for text and data mining for non-commercial research. In 2022, the UK was consulted on possible changes to support AI and data mining activity (UK Intellectual Property Office, 2022). According to these models, pre-generative AI, lawful access, lawful purpose, lawful market impact and lawful rights reservation were all part of the initial design choices.

Figure 2. AI Training and Copyright Decision Chain



Source: Author's synthesis of machine-learning stages and copyright analysis.

5.3 Output Infringement, Memorisation and Substantial Similarity

Outputs can infringe on their own, even if training is allowed. A model generating long texts, unique images, musical sequences or codings, which resembles an earlier work, may infringe reproduction or adaptation rights regardless of the legality of training.

The right question, therefore, is output-specific. R.G. under Indian law of substantial similarity analysis The question before us is whether protected expression has been materially copied, rather than whether the two works share an idea, theme or style. This distinction is particularly important in the context of generative AI as the models can mimic high-level stylistic features without mimicking copyrightable expression (*R.G. Anand v. Deluxe Films*, 1978).

The legality of training is different than output infringement. Even if the computational analysis and training of the model are lawful, the output may still infringe copyright if it produces a substantial part of a work. Indian law's concepts of idea-expression and substantial copying remain relevant. In the event, a claimant would need to identify protectable expression and demonstrate material copying, rather than merely rely upon similarity of style, theme, facts or overall ideas (*R.G. Anand v. Deluxe Films*, 1978; *Eastern Book Company v. D.B. Modak*, 2007). Before 2023, no Indian court had yet developed an artificial intelligence (AI)-specific test for

memorisation or regurgitation. Ordinary infringement doctrine thus remains the appropriate starting point.

Model providers have many ways to reduce risk, such as using anti-regurgitation measures, similarity filters, non-user-provided copyright text request limits, provenance systems and takedown responsiveness. These controls do not determine liability by themselves. However, they are relevant to the effective assessment of knowledge, intent, market harm, and relief. On the flip side, right holders also require reliable tools that allow them to identify unauthorized reproductions without claiming exclusivity over facts, styles or generic elements. The enforcement of AI copyright in the future will most likely depend as much on technical evidence and auditability as on high-level legal doctrine.

6. Patents and Artificial Intelligence

6.1 Inventorship: Can an AI System Be an Inventor?

Patent laws only cover protection for technical invention and not for expression. When it comes to AI, there is a corresponding authorship question: Who is the inventor when a machine contributes in a material way to an inventive concept? The global DABUS litigation question was whether an AI system could be named as inventor. As of the year 2022, the EPO's Legal Board of Appeal in J 8/20 confirmed that a designated inventor under the EPC has to be a natural person. The U.S. Court of Appeals for the Federal Circuit similarly held in *Thaler v. Vidal* (2022) that an inventor under the U.S. A person must be a human being. As per the UK Court of Appeal under domestic law patent in 2021, the same practical conclusion was reached (EPO, 2022; *Thaler v Vidal*, 2022; *Thaler v Comptroller-General*, 2021).

The crucial policy question is not whether AI can produce results that are technically useful (it can). It is how law assigns human responsibility. A human inventor can deploy advanced tools including machine-learning systems just as inventors have long employed simulation, computation and laboratory automation. When the human cannot credibly assert he invented the invention, a problem arises. According to Abbott, the owner will be automatically named as inventor by default unless some further redrafting occurs. This would rip inventorship away from intellectual contribution. Naming the AI will require a much broader rewriting of legal personality and entitlement rules (2020).

Given the current provision of the Patents Act, India's relatively safer option would be to maintain human inventorship while clarifying the threshold for AI-assisted inventions. Applicants must provide the names of the individuals who are responsible for making a significant invention contribution. This will be to any invention aspect. When no human meets the inventorship standard, legislation, not administrative interpretation, may determine whether



protection is appropriate. This avoids the creation of patent rights with no legally responsible inventor through a fiction not expressly authorized by statute.

6.2 AI-Related and Computer-Related Inventions in India

The Patents Act's Section 3(k) excludes a mathematical or business method or a computer programme *per se* or algorithms. The term *per se* has placed technical character at the core of Indian software-patent practice. The Delhi High Court stated in *Ferid Allani v Union of India* (2019) that inventions related to computers should not be denied because they are concerned with software and stressed technical effect or technical contribution. This approach recognizes that modern-day inventions usually consist of the software component along with hardware with networking and control system and measurable technical results (*Ferid Allani v. Union of India*, 2019).

Prior to 2023, Indian patent legislation with regard to software and AI-related innovation was primarily shaped by section 3(k) of the Patents Act along with the Controller General's Guidelines for Examination of Computer Related Inventions, 2017. The guidelines require the examiner to determine whether a claimed innovation falls within the excluded mathematical method, business methods, computer programme *per se* or algorithms whereas judicial interpretation has established technical effect or technical contribution. The Delhi High Court gave a very important judgment in *Ferid Allani v. Union of India* (2019). In said case, it stated that all inventions must not be rejected simply because they are computer programs. Moreover, the court emphasized the significance technical effect (Controller General of Patents, Designs and Trade Marks, 2017) (*Ferid Allani v. Union of India*, 2019).

Disclosure challenges also exist with AI patents. Patent law grants limited exclusivity in exchange for sufficient public disclosure of invention. A claim that relies on a non-publicly available model, unspecified training data, or undisclosed parameters may prove difficult to reproduce. Before 2023, the WIPO studies on AI and patent information have already highlighted the increasing importance of machine learning across technical fields, and the need for practices capable of supporting them (WIPO, 2019). This means that applicants should provide all the architecture, the relevant functional relations, and various implementation details that add up to the claimed effect but legitimate trade secrets outside the claimed invention must remain intact.

7. Online Infringement and Digital Piracy

7.1 Scale and Forms of Online Infringement

Unauthorized streaming, downloading and file-sharing; live-sports piracy; reposting of photos and videos; software piracy; distribution via cyberlockers; circumvention of technological measures in shops and sale of counterfeit digital or physical goods via online platforms. The key enforcement challenge is replicability: When a file is removed from one location, it appears again via another account, mirror domain or messaging channel. Because servers, registrars,



operators and users may be located in different countries, territorial jurisdiction is also strained (Frosio, 2020).

Copyright Act addresses the digital exploitation of copyright work through reproduction and communication-to-the-public rights. It includes civil liabilities, penalties and technological-protection measures provisions. The newly added provisions in the 2012 amendment, sections 65A and 65B, deals with circumvention of technological measures and protection of rights-management information. The copyright laws acknowledge that enforcement in the digital environment necessitates protection not merely from copying but also from interference with the technologies and metadata which are meant to control and trace authorised uses (Govt of India, 1957; Govt of India, 2012).

7.2 Intermediary Safe Harbour and Specific Knowledge

Intermediary liability balancing effective enforcement and the risk of platforming automatically liable for the massive volume of third-party content. The safe harbour created by Section 79 of the Act is conditional and is for intermediaries satisfying the statutory requirements. In *Shreya Singhal v. Union of India* (2015), the Supreme Court interpreted the “actual knowledge” provision in the intermediary framework in a manner tethered to court orders or government notices for unlawful content. This limited incentives for private censorship. Copyright is a matter of additional complexity because section 81 of the IT Act says that the rights under Copyright Act are preserved. However, it tries to harmonise the two.

The verdict in *MySpace Inc. v. Super Cassettes Industries Ltd.* was delivered by the Delhi High Court on 16 February 2016. The court held that safe harbour under section 79 can apply in copyright cases. Furthermore, it was held that general awareness is insufficient to attribute liability. The Court sought detail about the infringing content in question, and characterised the issue of safe harbour as a defence to be proven rather than a blanket immunity. The Demand Principle is best suited to large platforms because a demand to identify every potential infringement in advance would amount to imposing generalized monitoring or filtering. A platform that takes specific notice or plays an active role in the infringement at the same time cannot rely on the technical status of an intermediary to escape liability (*MySpace Inc. v. Super Cassettes Industries Ltd.*, 2016).

Notice-plus-accountability is the best enforcement model. Those who have rights should provide the specifics of identifiers, URLs or fingerprints. Intermediaries should act expeditiously, when legally obliged. Systems dealing with repeat infringement should target demonstrably abusive accounts. Counter-notice or review mechanisms should protect lawful use, criticism, quotation and public-domain material. Although automated filters can be helpful, they should not be considered infallible. The filters can be useful in identifying licensed

uses or exceptions. Moreover, it can incorrectly detect incidental similarity in material, which does not infringe copyright.

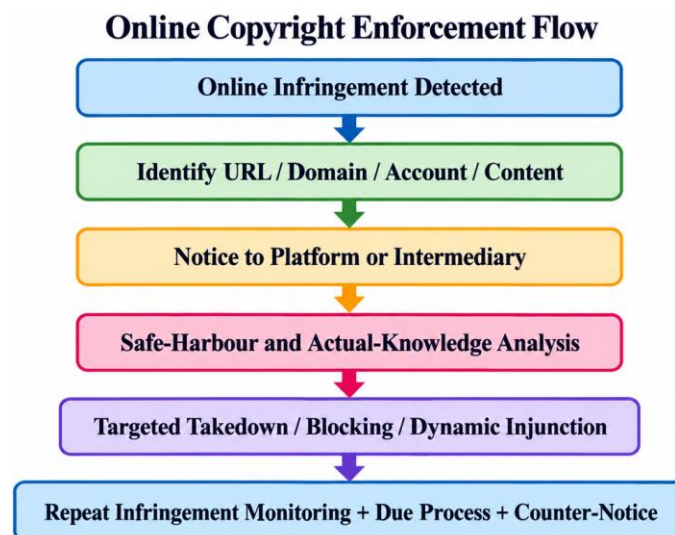
7.3 Rogue Websites and Dynamic Injunctions

The Indian courts have come up with dynamic injunctions for piracy sites that use mirror, redirect or alphanumeric domain names, thus evading conventional injunction orders.

The Delhi High Court outlined factors to determine whether a website is a “rogue website” primarily dedicated to infringement and allowed the plaintiffs to implead mirror or redirect sites so that the existing injunction would remain effective in *UTV Software Communication Ltd. v. 1337X.to* (2019). The remedy acknowledges that pirate operators move domain names quickly (*UTV Software Communication Ltd. v. 1337X.to*, 2019).

Injunctions that are dynamic enhance their efficacy but raise rule of law problems. Blocking orders for hosting providers that provide shared infrastructure can impact lawful content. Domain-level blocking orders may be disproportionate where the alleged infringement is limited to specific URLs only. It is necessary for courts to mandate proof of the site’s overwhelmingly infringing nature, include mechanisms for affected third parties to reach out for alteration, and differentiate between mirrors and independent websites. The publication of transparency reports by ISPs and right holders could reduce over-blocking and facilitate enforcement.

Figure 3. Online Copyright Enforcement Flow



Source: Author’s synthesis of intermediary safe-harbour and digital-injunction principles.

8. Streaming, Licensing and New Digital Markets

The processes of digital distribution have exposed gaps in statutory licensing. In the case of *Tips Industries Ltd. v. Wynk Ltd.* (2019), the Bombay High Court found that the statutory licensing under Section 31D of the Copyright Act did not cover the on-demand internet services and held that there was infringement due to unlicensed streaming and download activities. The



case shows a digital dilemma: Laws based on old broadcast categories do not lend themselves easily to personalized, interactive offerings. Expanding a compulsory or statutory license is a huge policy call as it affects bargaining power and remuneration; courts should therefore be slow to create such licenses by interpretation when the statutory text does not provide for it clearly (*Tips Industries Ltd. v. Wynk Ltd.* 2019).

There is a similar licensing issue with AI training. License agreements that are purely bilateral may work for high-value publishers or specialized databases, but they can be impractical where millions of works are involved. Policies like collective management and voluntary opt-out systems can lessen the costs of negotiations and other transactions. Any system should recognize small creators, public domain, open licenses and different level of market harm caused by difference usage of AI and give use and exploit choice. A rule that imposes one royalty on all trainings would likely not be efficient or fair.

9. Comparative International Approaches

Regulatory philosophies are quite different in the US, EU and UK. The doctrine of fair use and human authorship is central to U.S. copyright law.

According to a multi-part study conducted by the U.S. Copyright Office, only a human can author a work that could be copyright protected. The study suggests analyzing the training of AI through existing fair-use principles. It does not recommend creating an automatic exclusive right for AI. Use your own words to write about the content mentioned in the above text.

Prior to 2023, the EU had one of the clearest statutory approaches to computational analysis via Directive (EU) 2019/790. The Directive enables organisations engaged in research to conduct text-and-data-mining, outlines an exception for lawfully accessible works in cases where right holders have not expressly reserved their rights (European Union, 2019). Even though this framework does not target today's generative AI, it set a pre-2023 model for balancing computational use with licensing and rights reservation.

The United Kingdom had a narrow text-and-data-mining exception for non-commercial research and consulted on AI and IP in 2021-2022. The 2022 response was concerned with changes to the data-mining regime. Further, it addressed questions of computer-generated works and patents. The DABUS litigation reiterated the human-inventor assumption under present law. The European Patent Office achieved a similar outcome in J 8/20, and the U.S. *Thaler v. Vidal* (2022) by Federal Circuit also required the human inventor. The comparative trend was thus evident by the close of 2022: legal systems were willing to accommodate AI-assisted innovation but had not accepted the AI systems as such, as inventors, under domestic patent law (UK Intellectual Property Office, 2022; EPO, 2022; *Thaler v. Vidal*, 2022).

10. Comparative Table of Legal Issues

Issue	India	United States	EU / EPO / UK	Core challenge
AI-generated output	Section 2(d)(vi) addresses computer-generated works; modern AI scope unsettled	Human authorship required; protection for sufficient human creative contribution	Human-centred approaches remain dominant	Defining meaningful human creative control
AI training	No reported Indian generative-AI training judgment by end-2022; analysis based on Copyright Act and comparative TDM/fair-use principles	Fair-use analysis remains central and fact-specific	EU TDM exceptions with rights-reservation mechanism under Directive (EU) 2019/790	Licensing, market harm and lawful data acquisition
AI inventorship	Existing framework assumes human inventor; no settled DABUS-style Indian ruling	DABUS rejected under human inventorship approach	UK Court of Appeal, EPO and U.S. Federal Circuit require human inventors under existing law	Attributing conception and entitlement
Software/AI patents	Section 3(k); technical effect/contribution emphasized in Ferid Allani and CRI Guidelines	Software patentability governed by subject-matter eligibility doctrine	EPO technical character/technical effect approach	Avoiding patents on abstract algorithms
Online infringement	Safe harbour + specific knowledge + dynamic injunctions	DMCA notice-and-takedown and safe harbour	Copyright directives and the Digital Services Act framework adopted in 2022	Fast enforcement without over-removal

11. Major Indian and International Cases

Case	Court/Year	Issue	Significance
<i>R.G. Anand v. Deluxe Films</i>	Supreme Court of India, 1978	Idea-expression and substantial similarity	Foundational Indian test for copyright infringement
<i>Eastern Book Company v. D.B. Modak</i>	Supreme Court of India, 2007	Originality	Requires skill and judgment with creative input
<i>Shreya Singhal v. Union of India</i>	Supreme Court of India, 2015	Intermediary knowledge	Restricts actual-knowledge framework to legally cognizable notice
<i>MySpace v. Super Cassettes</i>	Delhi High Court, 2016	Copyright and safe harbour	Requires specific knowledge; harmonizes Copyright and IT Acts
<i>Ferid Allani v. Union of India</i>	Delhi High Court, 2019	Computer-related patents	Emphasizes technical effect/contribution
<i>UTV Software v. 1337X</i>	Delhi High Court, 2019	Rogue websites	Develops dynamic injunction against mirror sites
<i>Tips Industries v. Wynk</i>	Bombay High Court, 2019	Internet streaming licence	Rejects section 31D statutory licence for service at issue
<i>Authors Guild, Inc. v. Google, Inc.</i>	U.S. Court of Appeals, 2015	Mass digitisation and fair use	Treats search and text analysis as transformative on the facts
<i>Thaler v. Vidal</i>	U.S. Court of Appeals for the Federal Circuit, 2022	AI patent inventorship	Holds that an inventor under the U.S. Patent Act must be a natural person
<i>Thaler v. Comptroller-General</i>	UK Court of Appeal, 2021	AI patent inventorship	Rejects DABUS as inventor under existing UK patent law
<i>EPO J 8/20</i>	EPO Legal Board of Appeal, 2022	AI patent inventorship	Requires inventor designation of a natural person
<i>Google LLC v. Oracle America, Inc.</i>	U.S. Supreme Court, 2021	Software copyright and fair use	Illustrates fair-use analysis in the software and digital environment

12. Core Challenges for Intellectual Property Law

12.1 Defining Human Contribution

Both copyright and patent law depend on identifying human contribution, but AI makes contribution granular. A novelist may use AI for brainstorming while writing every sentence; a designer may generate hundreds of images and select one; an engineer may define a technical problem while an optimization model identifies a solution. Law should avoid binary categories of “human” versus “AI” creation. Instead, institutions should identify which legally significant choices were made by humans. For copyright, those choices concern expression. For patents, they concern conception of the inventive concept. This functional method is more stable than relying on the amount of computational assistance.

12.2 Transparency Without Forced Disclosure of Trade Secrets

Due to lack of transparency in datasets and model-development processes, right holders may not be able to know if their works are part of large datasets for machine learning. Publishing complete datasets on a mandatory basis could result in disclosing confidential information, trade secrets or personal data. Through policy work prior to 2023, a distinction grew between transparency and unrestricted disclosure. The WIPO consultation on AI highlighted the related but distinct nature of data access, ownership and confidentiality/Transparency and flagged the need for a future governance model that maintains accountability and legitimate secrecy. (WIPO, 2020)

12.3 Transaction Costs and Licensing

Government must be able to implement it. Asking for individual consent for every single work in a large dataset can create huge transaction costs. On the other hand, prohibiting licensing possibilities altogether may also undermine the market for protected content. scholars and lawmakers had already considered various avenues for reducing transaction costs by 2023, including collective management, machine-readable permissions, extended licensing, and statutory exceptions. Different sectors, such as news, music, software, photography and scientific publishing, have different market structures, making a single rule for every form of computational use, inappropriate. (Gervais, 2022 WIPO, 2020)

12.4 Jurisdiction and Cross-Border Enforcement

Disputes over digital IP are transnational. A dataset may be assembled in one country with servers located in another, a platform may be incorporated elsewhere and an infringing communication may reach users in India. Previously, evidence before 2023 in online copyright and intermediary cases shows that territorial rights must work in a networked environment. As a result, courts had to marry domestic jurisdictional rules with principles of comity, targeted

remedies and technical feasibility rather than simply assume that server location solves answer infringement question (Frosio, 2020; UTV Software Communication Ltd v 1337X.to, 2019).

12.5 Evidence and Technical Expertise

AI copyright lawsuits may hinge on unfamiliar factual nuances compared to run-of-the-mill litigation scenarios. For instance, parties might litigate whether a model memorized a work; whether a response was produced from model weights or external retrieval, how much of a dataset was retained. Evaluation of model architecture, technical effect and enablement is also necessary in Patent cases. Neutral technical expertise, carefully framed expert evidence and discovery protocols that protect legitimate confidentiality while permitting meaningful testing of claims. Courts and patent offices require this. In the absence of such mechanisms, outcomes may hinge on crude descriptions of AI systems.

13. Policy and Legislative Recommendations

1. Amend the Copyright Act or official guidance to clarify how section 2(d)(vi) applies to generative-AI works which will require proof of the existence of a human creative contribution rather than just setting in motion an automated process.
2. Maintain the separation between the legal permissibility of AI training and the legal permissibility of model outputs. Training ought to be assessed against reproduction rights, legal access, statutory exceptions, licensing and market effect; output infringement should remain subject to substantial similarity and other normal doctrines.
3. Create an efficient rights-reservation and licensing infrastructure for machine consumption for creators who would like to signal restrictions on commercial training through AI while ensuring usability for public-domain and open-licensed works.
4. Think about using collective or extended licensing models in an industry where individual transaction costs are extremely high; ensure governance and distribution rules are transparent and provide for meaningful opt-out rights.
5. Large commercial AI providers should have auditable records of major sources of training data and copyright compliance. Summary-level disclosure will be public, with more detailed confidential access for regulators and courts as legally justified.
6. Maintain human inventorship as mandated by the Patents Act until explicitly altered by Parliament The guidance on what human contribution is sufficient to warrant inventorship was issued.
7. Ongoing refinement of CRI examination so that AI claims are evaluated based on technical contribution not labels. Claims related to the business logic or abstract algorithms must remain excluded with proper scrutiny on actual technical solutions.
8. Improve patent disclosure standards for AI inventions. Disclosures should require sufficient information about the architecture, the functional steps, the training conditions and technical effect so as to enable the claimed invention. However, don't require disclosure that is unlikely beneficial to the public and that would force the disclosure of irrelevant trade secrets.

9. Establish guidelines for dynamic injunctions to ensure greater consistency across the courts, including evidentiary thresholds for rogue websites, procedures for adding mirrors, transparency, proportionality and rapid review for wrongly blocked domains.
10. Revamp notice-and-takedown mechanisms by introducing standardized electronic notices, validating rights-holders, including counter-notices, imposing penalties for abusive notices, and ensuring compatibility with reliable content-identification systems.
11. I think this website has a lot of potential and the information is very important. If you are also planning to launch a similar website, then I would recommend going to the best web development services to achieve that.
12. It is important to encourage the coordination of practices internationally, through WIPO and bilateral mechanisms, as training datasets cloud infrastructure and online infringement routinely cross borders.

14. Proposed Integrated Regulatory Model

Regulatory layer	Primary objective	Suggested mechanism	Safeguard
Creation / authorship	Protect genuine human creativity	Human-contribution test for AI-assisted works	No monopoly over ideas, styles or purely autonomous output without statutory basis
Training data	Balance innovation and rights	Fair dealing + licensing + rights-reservation infrastructure	Lawful access, transparency, market-effect review
Patent system	Reward technical invention	Human inventorship + technical-contribution test	Enablement and section 3(k) scrutiny
Platforms	Reduce recurring infringement	Specific notice, repeat-infringer controls, trusted notices	Counter-notice and no general monitoring mandate
Piracy sites	Effective enforcement	Dynamic injunctions against proven rogue sites	Proportionality and review against over-blocking
Governance	Increase trust and evidence	Audit logs, source summaries, expert procedures	Trade-secret and privacy protection

15. Discussion

The doctrinal developments analysed in the paper demonstrate that existing IP principles continue to remain useful but need more specificity. Copyright could plausibly distinguish idea



from expression, exclusive rights from exceptions, and direct infringement from intermediary liability. Patent law makes clear distinctions between abstract subject matter and technical invention, as well as affording legal personhood. Thus, the immediate need is not a separate “AI property right”, but clear rules about how existing principles apply to automated systems.

Pre-2023 copyright laws and systems demonstrate how far things can go and how far they can’t. The established norms could deal with originality, reproduction, substantial copying, fair dealing, intermediary liability and online injunctions, but these had not been tested holistically against contemporary generative-AI in Indian courts. This gap holds significance. Thus, any inference regarding AI training or autonomous output ought to be framed as doctrinal analysis and policy proposals and not as settled Indian case law. An approach to build from statutory text, established copyright principles, text-and-data-mining models and international consultations while acknowledging unresolved questions offers a reliable way forward pre-2023.

Just like everything else patent law has felt a similar risk of overreaction. Creative activity can occur at an accelerated pace with AI without any legal status for machines as inventors. According to IP Australia’s commentary, human inventorship will continue to work as long as agencies define what constitutes a material inventive contribution, and the applicants keep records. The bigger challenge for next year may be patent quality since broad AI claims drafted at a high level of abstraction could pre-empt fields of research without an enabling technical disclosure. It is thus essential to examine under novelty, inventive step, sufficiency and section 3(k) rigorously rather than just increasing the number of AI patents.

The area of digital IP law which is most operationally mature is online infringement. The ruling in MySpace and UTV Software shows that the Indian courts can combine intermediary protections with targeted enforcement. Open digital platforms need a safe harbour but it must exclude deliberate facilitation of infringement. Flexible injunction orders must be in place against sites where the design is such as to evade the existing orders. However, it should not be an automatic mechanism to get the domain-name blocked. Both areas are governed by a similar principle which is specificity: specific protected works, specific infringing locations, specific evidence of rogue conduct and specific procedures for correction.

16. Conclusion

The digital age intellectual property rights are changing as a result of three connected forces – artificial intelligence, software-driven innovation and worldwide online distribution. Generative AI questions the presumption that creates who, what copies, and when computational analysis is a legally pertinent use. Patent laws must figure out how to reward AI-assisted technical invention without stripping human inventorship or granting monopoly over abstract algorithms. The remedy required for online infringement must be capable of functioning at internet speed and not transform intermediaries into universal monitors.

Crucial foundations have already been built by law. R.G. Anand and Eastern Book Company have laid down perennial tests of expression and originality. A technical-effect framework for



computer-related inventions is given by Ferid Allani. MySpace protects conditional intermediary safe harbor while requiring specificity. UTV Software provides an antidote against evasive rogue sites. The recent *ANI Media v. OpenAI* case emphasizes the copyrights of producers in limited media and how to assess output similarity of generative-AI by fair dealing and reproduction. The evidence illustrates that through principled interpretation, the legal order can adapt, but any major policy choice should ultimately be made openly and transparently through legislation and regulation.

The most sustainable reform agenda, therefore, is human-centred, technologically informed and procedurally balanced. Copyright should protect human creativity and legitimate markets while allowing for research, criticism, public-domain access and innovation. Contribution de la façon dont un problème est résolu. Platform rules must enable swift targeted action while ensuring safe harbours and counter-notice protections. AI suppliers must enhance transparency and auditability, but not to the detriment of legitimate trade secrets. If India adheres to these principles, a coherent force of creativity and AI can strengthen the country while ensuring that digital innovation is consistent with the rule of law.

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