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GENETIC INFORMATION AND MARKET SUPREMACY: A STUDY ON DIGITAL AND ALGORITHMIC BIOPIRACY IN MODERN BIOTECHNOLOGY UNDER PATENT AND COMPETITION LAWS

B. Veena Nirudhiya*

ABSTRACT

Undeniably, machines and humans have begun to co-exist due to the rise of artificial intelligence and machine learning. These technologies have entered the domains of biotechnology, genomics, and biodiversity-based innovative processes, creating numerous opportunities from digitised biological data. The conceptualisation of digital and algorithmic biopiracy, particularly in genomic and computational biotechnology, is the focal point of this paper. This concept can be understood as the appropriation of knowledge associated with biodiversity through technical and AI-driven processes, in which algorithmically generated outputs are protected by patent law without compliance with access and benefit-sharing obligations. This biopiracy operates through patent rights and digital control over biological data, raising concerns not only regarding environmental issues but also within the purview of patentability and competition laws. Algorithms with technical effect can be protected under the patent regime, and granting patents over AI-derived biological innovations without scrutinising the data can potentially lead to monopolisation. Such patent protection can create anti-competitive consequences and ensure a dominant position and disproportionate control over the essential algorithmic inputs in various pillars of modern biotechnology. Algorithmic biopiracy can significantly cause anti-competitive concerns in bio-digital markets by granting exclusive control, affecting market participation. The paper demonstrates the interconnectivity between patent and competition laws in countering digital and algorithmic biopiracy by adopting a doctrinal and comparative approach, and analyses the legal frameworks of patent and competition law with reference to various global perspectives on algorithmic and digital

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biopiracy in modern biotechnology. The study highlights significant legal lacunae in addressing this biopiracy within the ambit of anti-competitive practices and economic concerns, and questions the adequacy of existing patent law and competition law frameworks in effectively addressing the issues in ensuring dynamic market competition and fair access to biological knowledge.

KEYWORDS: Patent, Biopiracy, Algorithm, Digital, Biotechnology, Competition.

INTRODUCTION

Patent law plays a vital role by granting exclusive rights to the inventors. Due to innovative aspects, Biotechnology holds a significant position in the Patent law. It holds an unavoidable place in the modern, technologically advancing society. It actively integrates biological science with the technological processes in order to develop new products in various pillars of biotechnology, like in pharmaceuticals, agricultural, industrial applications and mostly in genomic and computational processes.

In modern biotechnology, biological materials are not used or stored in the traditional laboratory methods, but rather, they have been transformed into data and datasets that possess patentability value. If the sources used for the invention relating to biotechnology, collected from any specific population, holding inventive value, the benefit must be shared properly with such groups by the inventors. If any appropriation of biological resources, genetic materials or any related knowledge capable of patentable claims had been utilised with no prior consent or benefit sharing, it amounts to Biopiracy.

It is pertinent to note that traditional and earlier forms of biopiracy, known to the public involves physical extraction of resources, like any plant varieties or medicinal products and patenting the same, making the accessibility of the resources complicated and ensuring no benefits reach the hands of the people from whom such resources had been extracted. However, in the case of genetic components, sequences, microbial data, and datasets, which are converted to digital form, analysed, and forwarded for patent claims, this is done without proper recognition of the actual source of the collected material.

In patent regimes, if broader claims are made, particularly over isolated genes, functional sequences, or any biological processes, it can create an adverse impact on biological resources as private property. The intersection of algorithmic and computational tools used in genomic biotechnology has potentially increased concerns regarding biopiracy.

It is pertinent to note that biotechnology can be considered as a genus operating applied biological innovation. In contrast, Bioinformatics is a subdomain that supports biotechnological research through computational analysis of biological data. The application and development of AI in bioinformatics, particularly through AI-based diagnostics, demonstrate its emergence as a transformative force in the traditional biotechnological landscape.

In genomic and computational biotechnology, when a genome is sequenced, it generates numerous digital datasets that cannot possess any valuable meaning. Through bioinformatics, the data will be analysed by the algorithms, and then the same will be compared with the existing genomes, which will be used as references to identify necessary patterns like disease-causing gene variants, etc. The resulting algorithmic and digital output based on the analysis will later be used in biotechnology to develop drugs or apply gene-editing techniques, etc. Thus, these outputs are capable of clearly identifying the important elements to be studied from the genomic data, which amounts to a biotechnological innovation and potentially raises patentability concerns.

Furthermore, such outputs are a crucial component of biotechnological invention, and they become tools for biopiracy if they are not acquired under the proper conditions. Also, control over the algorithmic outputs used in genomic and computational biotechnology poses serious anti-competitive threats. If proprietorship is granted to genomic datasets, it can create substantial barriers to entry into the marketplace, apart from environmental and healthcare concerns. Practices such as patent thicketing, clustering, evergreening, misuse of data exclusivity provisions, and dominance through biotechnological data can potentially distort various markets and result in public concerns. Thus, the outputs generated cannot be used in this manner, raising serious questions about the entire genomic biotechnological field. Therefore, the intersection of patent law, biotechnology, bioinformatics, and algorithmic innovation needs clear scrutiny through the principles of competition law.

BACKGROUND OF THE STUDY

It is evident that the biotechnological advancements is increasingly dependent on bioinformatics and algorithmic outputs to access the biological data and from the results to create an innovative process or product. The algorithms are utilised to analyse the DNA sequences, identify variants, predict genomic functions and study the protein structures. These generate the results, which can be referred as algorithmic outputs. These are necessary for genetic diagnostics, gene editing, drug discovery and even in precision medicine, which shows

a significant evolution from laboratory focused experiments to data-driven innovation. However, this essential shift also raises questions regarding concerns on patent law frameworks.

Concerning Patent law, algorithmic outputs derive interpretations from naturally occurring genetic information which primarily resides in the grey area between the patentable and non-patentable inventions as well as the position between discovery and an invention. In addition to this, the output generation through software and AI tools also questions the fundamental aspects of patent law. Even though, the technical contribution is considered, that may be serve in all the cases where it may lead to failure of incentivisation of the work.

In the lens of biotechnology, if such incentivisation is provided without addressing the actual population which supported with the knowledge can potentially leads to biopiracy, not in the conventional way but in the digital manner. This will affect the community as well as the other companies in the marketplace when the dominance is exerted through anti-competitive measures. Thus, an analysis of role of algorithmic outputs, the consequences of patentability of such outputs, how potentially it affects the respective community if it is acquired without consent, and imbalance between the patent and competition laws framework is necessary to understand the implications of digital and algorithmic biopiracy in the patent and competition perspectives.

The integration of bioinformatics and algorithm outputs into genomic and computational biotechnology has significantly transformed the traditional aspects of biological innovation. However, existing patent regimes address the conventional methods used in biotechnology like giving primary focus to the laboratory-based inventions. At first place, there is an inadequacy in properly addressing the innovations derived through interpretation and computational analysis of naturally occurring genetic information like incorporation of bioinformatics and interpretation through algorithmic outputs and pros and cons of such usage in both the lens of biopiracy and anti-competitive concerns. The need for addressing the biotechnological inventions in the competition law perspective is essential because the future advancements can potentially focus on the economic benefits as well as the public concerns. To sustain in the marketplace, embracing technological advancements in biotechnology is also crucial.

But it is pertinent to note that the patent regime is inadequate in referring digital and algorithmic biopiracy, affecting both the people and fellow competitors in the market due to inherent

loopholes and fundamentally questioning whether such incentivisation of outputs can provide overarching powers to the companies, leading to monopolisation and unfair competition.

CONCEPT OF DIGITAL AND ALGORITHMIC BIOPIRACY

ROLE OF COMPUTATIONAL GENOMICS IN BIOTECHNOLOGY

In modern biotechnology, computational genomics plays a significant role in transforming the industry of biotechnology according to technological and scientific advancements. Computational genomics is the interdisciplinary field that potentially utilises advanced statistical and computational methods to analyse the data regarding the whole genome and to derive conclusions regarding the biological functions controlled by the DNA sequences.[1]

It utilises various fields like mathematics, computer science and genomics to conclude and has various applications like biotechnology that may potentially lead to the development of new bioproducts, synthetic medicines and precision medicines.

In order to achieve the practical biological advancements, computational genomics utilises bioinformatics algorithms that eventually generate the algorithmic outputs necessary for the identification and interpretation of variations and sequences in genes. For instance, Multiple sequence-alignment algorithms can potentially generate outputs that help identify gene mutations associated with a particular disease. This can be achieved by comparing across genomic sequences and used in developing diagnostic tests and therapies.[2] Thus, it is evident that computational genomics significantly applies the generated outputs and helps in transforming raw biological data into new biotechnological inventions.

WHAT ARE ALGORITHMIC OUTPUTS

Algorithmic outputs can be understood as the results that can potentially help in interpreting new aspects of the complex datasets. It can be generated by advanced computational models used in all fields of bioinformatics and computational genomics in biotechnology, particularly in medical sciences.[3] These outputs are derived from the genomic data. It differs from the normal computer outputs, which usually automate already defined tasks alone. These algorithms are generated through bioinformatics and encompass gene functions, protein structures, and other related information. The evolution of genetic resources into abstract outputs potentially induces commercial exploitation even without physical access to that

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[1] Lee S, *Computational Genomics: The Future of Biotechnology, Harnessing the Power of Genomics Data for Innovation and Discovery,* https://www.numberanalytics.com/blog/computational-genomics-future-biotechnology

[2] *Key Bioinformatics Algorithm*, FIVEABLE, https://fiveable.me/lists/key-bioinformatics-algorithms

[3] World Intellectual Property Organisation [WIPO], *WIPO Technology Trends 2019: Artificial Intelligence* 25–30 (2019), <https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf>

particular biological material, which may consequently derogate the obligations of benefit sharing under the Convention on Biological Diversity[4] (CBD) and Nagoya Protocol.[5]

It is pertinent to note that the bioinformatics algorithm plays a significant role in generating the outputs to interpret the issues. The bioinformatics algorithms can be understood as the computational engines that are capable of altering raw biological data into meaningful data. It is essential to understand not only the functions of such algorithms but also why they work. These are closely associated with addressing the questions relating to evolution, diseases, and the functions of genes[6].

These act as tools to determine the association and correspondence between the DNA sequences, genes, and genetic variations that may be crucial to identify in different traits[7]. Algorithmic outputs are the results of bioinformatics algorithms. The tools of computational bioinformatics hold significance in understanding the correspondence between DNA sequences and genes, and in identifying characteristics that may reflect traits or diseases.

DIGITAL BIOPIRACY IN THE LENS OF COMPETITION LAW

Since the algorithms hold an important position in computational genomics in biotechnology, they can also lead to various issues in the aspects of inappropriate and unfair usage. It is well known that biopiracy occurs when there is an unauthorised usage, access, extraction and/or exploitation of the biological resources without prior consent or benefit sharing to the actual community that holds the knowledge of such resources.[8] It is clear that using the bioinformatics algorithms as a tool, the outputs can be generated, and such generated elements and outputs, like isolated gene functions, compounds, etc can potentially have the value of patentability. Though mere algorithms cannot be patented per se, by using such algorithmic outputs, if any novel invention has been made, such can amount to proprietorship under patent law.

In these cases, Digital Biopiracy can arise when those algorithms are processed, the genetic data can be assessed, and it can be converted into knowledge that can be protected by a patent regime. It provides proprietorship to such data, without informing and sharing the benefit with the communities, where it paves the way to claim exclusive rights over such biological

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[4] Convention on Biological Diversity, 1760 UNTS 79, 31 ILM 818 (1992)

[5] Nagoya Protocol on Access To Genetic Resources and the Fair And Equitable sharing of Benefits arising from their utilisation to the Convention On Biological Diversity, 2010 3008 U.N.T.S. 3.

[6] Supra note. 2

[7] GeeksforGeeks. (2024, April 26). *Bioinformatics and its Application*. GeeksforGeeks. https://www.geeksforgeeks.org/biology/bioinformatics-application/

[8] Agrani Bati, *BIO-PIRACY: A GLOBAL CONCERN AND PROTECTION OF TRADITIONAL KNOWLEDGE IN INDIA*, NLUA Journal of Intellectual Property Rights ISSN: 2583-8121 (Online) Volume 3 Issue 1.

information that originates specifically from any indigenous regions.[9] From the perspective of competition law, Biopiracy not only affects the indigenous communities but has the potential to distort the marketplace through monopolising the biotechnological inventions. It can consequently result in increasing restrictions on access to knowledge and stifling innovation.

Also, when a dominant entity holds ownership towards the inventions based on such algorithmic outputs and uses the same with the intention to exclude its rivals from its way, it marks a potential abuse of dominant position in the market. Thus, it is necessary to understand that Biopiracy in this aspect is two-fold, which can disrupt the enjoyment of the indigenous community through such biological resources and through overarching rights; it can affect the rivals and disrupt fair competition in the market. For instance, a plant genome is stored in a public database where the algorithm identifies the medicinal property of the gene while analysing the genome. Through the value of such property, a company claims exclusive protection through a patent for a drug on the basis of that gene. In such circumstances, this amounts to biopiracy when there is no prior informed consent or equitable benefit sharing reached the respective community.

PATENTABILITY OF ALGORITHMIC OUTPUTS IN GENOMIC AND COMPUTATIONAL BIOTECHNOLOGY

Patents are granted as an exclusive right to the respective owner to prevent any other third party from making, using, or commercially exploiting an invention for a limited period, which is mostly up to 20 years in most of the jurisdictions. This monopolistic control is justifiable as it is intended for the incentivisation of any invention made that eventually benefits the public as a whole.[10] However, it is pertinent to note that such incentivising exclusive rights may become a monopolistic approach when such protection overarches to fundamental knowledge on the resources or any essential information holding outputs.

As stated earlier, the algorithmic and digital outputs in genomic and computational biotechnology are inclusive of gene disease associations, predictions on gene mutation, and gene variations regarding traits or diseases through bioinformatics and AI. These are indeed produced through computational processes and actively represent the interpretations of naturally occurring biological data in modern genomic biotechnology. From these

[9] *ibid*

[10] What is a Patent? Patent Meaning & Definition | 9 Major Benefits. (2026). Intepat.com. https://www.intepat.com/blog/patent-meaning-significance

characteristics, it is necessary to answer whether such outputs can potentially hold the value of being an "invention" by itself or a mere abstract algorithm.

In Indian Patent law, algorithms per se cannot be patented.[11] The provision deliberately excludes algorithms and computer programmes within the ambit of patent protection in India. In addition to that, the mere discovery of a natural phenomenon can never be patented in India.[12]

Thus, the functions of algorithmic outputs are mere identification and analysis of the biological data, which can be excluded from the purview of patent protection if the claim was made independently. However, if the claim is made as the method or system that utilises such outputs for achieving a technical effect or it possesses an inseparable link with the hardware, the protection under patent can be claimed.

The case that cannot be ignored in the circumstances where the patentability of computational inventions is discussed is Ferid Allani v. Union of India[13], emphasising Section 3(k) cannot act as an absolute barrier for patent protection. This case clarified the position of patentability of computational relations, where the claim for protection can be made when the claimed invention demonstrates any technical effect or contribution. The algorithmic outputs can be patented when they are capable of solving technical issues and producing an industrial outcome without theoretical and information-providing outputs per se. In genomic biotechnology, these outputs can be protected under the ambit of a patent only when they are integrated clearly with the technical system and show industrial applicability, like the improvement of efficiency in gene sequencing.

The landmark case of Association for Molecular Pathology v. Myriad Genetics, Inc.[14] speaks about the extent of patent protection to the naturally occurring genetic information. It was made clear from this case that when genetic information was identified through technologies and isolated, such information cannot be patented merely on this ground. The principle can be applied in the aspect where proprietorship on naturally occurring substances cannot be claimed due to the extraction made through technological tools. This is the exact focal point that answers why patenting such outputs can threaten the aspect of discovery into an unjustified monopoly.

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[11] The Patent Act, 1970, §3(k)
[12] The Patent Act, 1970, §3(c)
[13] Ferid Allani v. Union of India, Dec 12, 2019
[14] Association for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013)

If the mere algorithmic outputs were granted a patent shield, the monopolistic approach can be seen not through the physical products or substances but rather through essential knowledge inputs. These are essential for any biotechnological invention, and when this has been derived without benefit sharing and attempting to monopolise in the purview of technical effect can harm the field of modern genomic biotechnology. These outputs function as necessary elements to be referred to in diagnosis and drug development, where if these are provided with exclusive rights can potentially affect the marketplace participants from offering alternative tests using the knowledge, potentially restrict the research access and stagnates the further innovation in the field. In addition to this, when there is non-compliance with Access to Benefit Sharing, it significantly undermines the market foreclosure.

Thus, Indian patent law prevents digital biopiracy and encourages a fair competitive marketplace. However, it is pertinent to note that mere assertions of technical contributions cannot be considered as a ground of patentability where the strict adherence to the "real technical effect" condition is to be followed. There is a need to revise the guidelines in this regard periodically, and the aspect of technical effect must be keenly observed according to the cases. On this basis, patent protection must be granted when it comes to genomic and computational biotechnology with clear assertions.[15]

ANTI-COMPETITIVE DIMENSIONS AND STRATEGIES IN ALGORITHM USAGE IN GENOMIC BIOTECHNOLOGY

Digital and algorithmic biopiracy can likely occur in cases where the algorithmic outputs are appropriated and granted patent protection without complying with Access and Benefit-Sharing obligations. It clearly differs from traditional biopiracy due to the exploitation of information derived from biological data by altering and converting the publicly available knowledge into a private asset. In addition to biotechnological concerns, it can also potentially cause serious anti-competitive concerns.

In cases when the algorithmic outputs are made inaccessible in the guise of "technical effect" they can stifle innovation. The technical contribution is a necessary ground, but it cannot be considered as a sole justification for the grant of patent protection to an algorithm if it does not comply with the essential aspects of patent and ABS compliance. It is against innovation because it can restrict the development of alternative solutions in diagnosis, drug development and any other crucial process in genomic biotechnology, due to such protection.

[15] Microsoft Technology Licensing LLC v The Assistant Controller of Patents and Designs, C.A. (COMM.IPD-PAT) 29/2022

It is also significant to note that strategic patent thicketing, exclusive licensing of the patent and misusing the protection through data exclusivity can be considered as notable anti-competitive strategies that may be used by the dominant entities.

PATENT THICKETING

Patent Thicketing is a strategy of creating a dense web of overlapping patents that are closely interrelated regarding a particular product, research or technology, which prevents any competitor from entering the market in such regard.[16] It pushes the competitors to negotiate for multiple licenses as the only way, and this poses a high level of infringement risks. It keeps the competitors in a constant fear of developing alternative technologies due to litigation, licensing or prohibition through high royalty imposition. Even though there is no deliberate case seen in digital and algorithmic biopiracy, this sector of genomic and computational biotechnology is also highly prone to the risk of thicketing due to its nature.

This practice is prominently seen in biotechnology, where this field includes higher investment in genetic research.[17] Patent Thicketing can also be used in this sector due to the active involvement of algorithmic outputs and information derived from biological resources, and converting the same into digital data. Due to multiple overlapping patents, the dominant entities can hold more control and transform non-commercial biological information into proprietary assets, restricting access to the available information by giving it a shape. Thus, this can be considered as the potential obstacle as a threat of biopiracy on one hand, as well as an anti-competitive practice in other hand in genomic biotechnology.

LICENSING TRENDS

The strategic licensing of patents can also contribute as an anti-competitive measure, where it is prominently used by dominant entities. This strategic usage looks like protecting the rights, but implicitly, it amounts to aggressive enforcement of their exclusive rights. it can be in the way of express and deliberate restrictive licensing conditions or implied strategic conditions.

This practice significantly affects competitors from accessing essential technologies. The licensing terms must not be exerting the dominance but rather impose fair conditions.[18] In the landmark case of Federal Trade Commission v. Qualcomm Inc.[19], though the act of the party was considered hyper competitiveness regarding the “no license, no chips” policy, it will not

[16] *What is Patent Thickets - An Analysis*. (n.d.). Www.globalpatentfiling.com. https://www.globalpatentfiling.com/blog/examining-various-dimensions-patent-thickets

[17] *Untangling Patent Thickets: The Hidden Barriers Stifling Innovation - TT CONSULTANTS*. (2024, June 26). Ttconsultants.com. https://ttconsultants.com/untangling-patent-thickets-the-hidden-barriers-stifling-innovation/

[18] Mosanto Holdings Private Ltd. and ors v. Competition Commission of India and Ors, W.P. (C) 1776/2016

[19] Federal Trade Commission v. Qualcomm Inc., No. 19-16122 (9th Cir. 2020)

remain the same circumstance, and it will amount to an anti-competitive measure when it exceeds the threshold of using licensing terms more strictly, non-beneficial to others in the marketplace. The licensing terms cannot be used as a mask to enforce the rights aggressively by any dominant entities.

In genomic and computational biotechnology, strategic licensing over bioinformatics algorithms and their outputs, like controlling access to gene-disease relation, algorithms associated with disease or traits, etc can stifle innovation and restrict the alternative research approach of other existing entities in the market. In addition to this, if the same strategy utilised towards the indigenous community from whom the information is collected, such restrictive licensing can potentially amount to algorithmic biopiracy due to alteration of biological knowledge into commercial products without proper appropriation. Thus, strategic licensing can lead to both patent law and competition law concerns and scrutiny upon this aspect is necessitated.

DATA EXCLUSIVITY AS AN ANTI-COMPETITIVE TOOL

Data exclusivity can be understood as a protection provided to the innovators for a particular period of time over any datasets or outputs that have been submitted for regulatory approval.[20] This is one of the best protections given to the proprietors for their invention, but it can also be utilised as a tool to abuse the exclusive rights. The algorithmic outputs can be considered as the essential inputs in genomics and computational biotechnology, which can be substantially misused for the self-serving purposes of dominant entities. This can potentially align with the aspects of digital biopiracy when terms were not complied. This incentivising aspect can be used as a shield, and the aspects of misappropriation may not be seen during such a temporary period. When the genetic resources in question without ABS compliance had been provided with exclusivity protection, it challenges the rights of the respective community and competitors simultaneously.

This can lead to reinforcement of anti-competitive practice through the data and information, where the aspect of data exclusivity can function as a catalyst for digital and algorithmic biopiracy. Hence, the actual objective of data exclusivity can be misused to create a barrier to entry and concentration of market power easily through combining with non-compliance to ABS and patent terms.

COMPARISON OF POSITIONS OF THE US AND EU WITH INDIA

[20] Supriya Malviya, *DATA EXCLUSIVITY AND RIGHT TO HEALTH: AN ANALYTICAL STUDY*, I P BULLETIN Vol. V Issue 1, JAN-JUN, 2024, Pg. 20-34.

There is no sufficient address towards the study by combining both the domains, but the principles and legislative measures can be interpreted in a way to represent the issue. Through the existing frameworks, the issues can be addressed to a certain extent.

THE UNITED STATES

The legislative frameworks in the US can be evidently seen to balance incentives for innovation and competition aspects, encouraging proper access to the resources in computational biotechnology and genomics. The Hatch-Waxman Act[21] provides for data exclusivity for drugs, can implicitly protect the outputs used for drug development, disease and trait identification through genes by ensuring that the same cannot be used for the exertion of a dominant position. Furthermore, the Bayh-Dole Act[22] permits the institutions to own inventions, including algorithms for genomic analysis, ensuring public access and private rights.[23] The States ensure the protection of the algorithms and prevention against improper usage, as different issues, but attempt to protect against the same, attempting to balance the private and public interests, but addressing the issue effectively is necessary.

EUROPEAN UNION

The ambit of competition and data exclusivity has been regulated by the EU in various ways, including algorithms to protect innovative practices and against anti-competitive measures. The focus was given to the pharmaceutical sector in most of the countries, where the regulatory data protection protects for 8+2+1 years, and the market protection is provided for 1 year.[24] The indirect protection can be the only path available at present in the cases of algorithmic outputs in biotechnology. In the aspect of Anti-trust law, the Digital Markets Act and antitrust rules of the EU prevent the exertion of dominance and anti-competitive agreements, particularly in digital markets, aligning with the protection of data and algorithms.[25] But there is a necessity to specifically address the algorithmic outputs and related emerging issues associated with genomic and computational biotechnology.

Thus, it can be understood that the US and EU have data protection regimes linked with competition and patent law to protect innovation. Though they take measures to safeguard

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[21] The Drug Price Competition and Patent Term Restoration Act (Public Law 98-417)

[22] The Bayh–Dole Act or Patent and Trademark Law Amendments Act (Pub. L. 96-517, December 12, 1980)

[23] *Biologics and Biosimilars Landscape: IP, Policy, and Market Developments | JD Supra*. (2024). JD Supra. https://www.jdsupra.com/legalnews/biologics-and-biosimilars-landscape-ip-5898809

[24] Garattini, L., Badinella Martini, M., & Mannucci, P. M. (2021). Pharmaceutical patenting in the European Union: reform or riddance. *Internal and Emergency Medicine*. https://doi.org/10.1007/s11739-021-02887-6

[25] Team, S. P. (2025). *Digital Markets Act (DMA) Explained [2025]*. Https://Secureprivacy.ai/; Secure Privacy. https://secureprivacy.ai/blog/digital-markets-act-dma-explained-2025

biotechnological innovations, they incorporate measures separately, and the concern of digital and algorithmic biopiracy is yet to be focused on and addressed. Even in India, the same concern arises, but the importance of the balance between public access and private rights is somehow given more necessity compared to other developed countries.

ADEQUACY OF THE EXISTING PATENT AND COMPETITION REGIME IN INDIA

The doctrinal connection between Patent and competition law, along with the aspects of biodiversity in the ambit of genomic and computational biotechnology, shows an inherent conflict in properly addressing the overlapping issues. The issue seems to be less serious, but it can potentially cause significant implications by combining different underlying principles in various legal domains in one particular biotechnological field. The patent law grants exclusive rights, which in certain cases can potentially conflict with the biodiversity principles due to the absence of a clear definition in the understanding of "technical effect" and its changing nature according to the cases.

From a competition law perspective, though there are evident practices of anti-competitive measures, the application of this law in IP cases remains inconsistent. Though there are cases aligning in the domains of both patent and competition laws, the concerns regarding anti-competitive measures are less focused, leading to the usage of anti-competitive strategies potentially remaining higher.

It is necessary to combine the principles actively to protect the rights of the aggrieved parties. The genomic data holder can affect the rights of the communities as well as restrict the active participation of the competitors effectively, if the principles in the patent and competition laws are not effectively utilised, depicting that there is a clear imbalance in the Indian framework.

CONCLUSION

The intersection of modern biotechnology, like computational genomics and AI, has created a complex concern called digital and algorithmic biopiracy. The terms are inherently different, where the former is wider, including the latter. There is a clear transition from physical storage to digital datasets. The traditional way of protecting the components is considered insufficient in this modern era. The new emerging issues, like this question the protection given by the Convention on Biological Diversity (CBD) and the Nagoya Protocol. The bioinformatics algorithms process the genomic sequences, and the outputs generated regarding various genes and their variants play a crucial role in computational genomics, where the dominant entities can also attempt to claim protection over them. The claim of patent protection through

undefined technical effects, non-physical access to the source material, and non-compliance to ABS are some of the potential ways through which the digital and algorithmic biopiracy can be made by such entities. This study depicts the existing patent and competition law frameworks in the US, EU and India, where it is found that there is an inadequacy in effectively addressing these new challenges regarding the bio-digital market. Due to this, it can potentially leave a lacuna in protecting the rights of the respective communities to whom the knowledge is known, as well as the emergence of an unfair market ambience in the marketplace due to monopolistic control over the information and strategic dodging of the responsibility in allowing public access to such biological resources. Though there are no evident cases now in this regard, there is a deliberate threat regarding this issue due to the development and technological advancements in modern biotechnology. To align the incentivisation and fair competition, Patent regimes should require compulsory disclosure of Digital Sequence Information and other details utilised for the generation of the algorithmic outputs from the biological resources. It is also necessary to clearly explain the technical effect and contribution to oppose the misuse of this aspect in genomic biotechnology. The competition law measures must also be scrutinised along with patent and biodiversity concerns to counter the strategies used in the bio-digital markets effectively.

BARRIERS FACED BY WOMEN INVENTORS IN ACCESSING INTELLECTUAL PROPERTY PROTECTION

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Dr Inderpreet Kaur[**]

ABSTRACT

The present era is marked by significant milestones for women across various fields. Although women inventors have existed in the past, the range of opportunities and areas available for invention today is broader than ever before. The women-led movement is steadily gaining momentum, reflecting a transformative shift in societal attitudes and increased recognition of women's capabilities as innovators, leaders, and change-makers across diverse sectors. However, it is not easy for women to make a mark as inventors, as there are many barriers which are faced by women as they put their intellect and abilities to good use. The study highlights key obstacles such as a lack of awareness and legal literacy regarding IP rights, financial constraints associated with filing and maintaining IP registrations, procedural complexities, limited institutional support, and persistent gender biases within innovation ecosystems. It further explores how these barriers affect women, particularly those from marginalised and rural backgrounds, thereby reinforcing existing inequalities in innovation and technological advancement. Adopting a doctrinal approach, the paper analyses relevant IP laws, policies, and institutional frameworks, complemented by secondary data. The paper concludes by emphasising the need for gender-responsive IP policies, enhanced awareness programmes, simplified procedures, and targeted institutional support to ensure equitable access to IP protection for women inventors. Strengthening access to IP rights is essential not only for empowering women inventors but also for fostering inclusive and sustainable innovation.

KEYWORDS: Women inventors, Intellectual property rights, Gender inequality, Access to IP protection, Innovation.

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INTRODUCTION

Intellectual Property (IP) protection is a key mechanism for recognising and securing innovations. It confers exclusive rights to inventors, enabling them to commercialise, profit from, and be credited for their inventions. Strong IP rights are widely acknowledged as drivers of technological advancement, economic growth, and social development. However, access to these protective mechanisms is not evenly distributed across socio-demographic groups. Globally, women inventors are significantly underrepresented in IP systems. Despite increasing participation of women in science and engineering, data consistently show lower rates of patent applications and grants among women compared to men. This gap reflects not a lack of ingenuity but systemic barriers that impede women's full participation in innovation ecosystems.

Scholarly research indicates that women face distinct challenges in pursuing IP protection. These challenges include limited access to information and awareness about IP rights, gender biases in legal and institutional processes, unequal access to resources and networks, and socio-cultural expectations that often do not give preference to women's innovation work. Moreover, women entrepreneurs and inventors frequently report difficulties in accessing funding, legal counsel, and mentorship that could support their IP strategies. Such barriers are made worse in developing countries where legal literacy and institutional support for IP are already uneven. Consequently, the underutilization of IP protection by women has implications not only for gender equity but also for the economy. In the Indian context, although there have been strides in enhancing IP infrastructure and awareness campaigns, women inventors continue to be underrepresented in patent filings and IP commercialisation. National statistics reveal a persistent gender gap, women constitute a smaller share of inventors listed on patent applications, and fewer women are seen in high-impact technology sectors. Institutional reports and rights-based advocacy groups have highlighted structural impediments, including a lack of gender-inclusive IP education, limited mentorship opportunities, and constraints in accessing formal legal mechanisms. This situation reflects broader patterns of gender inequality in science, technology, engineering, and mathematics (STEM) fields, wherein women's innovations may remain unprotected and undervalued .[26]

[26] Banerjee, D. (2026, February 11). *Gender gap in STEM learning widens, despite female intake at IITs doubling in 7 years*. *The Indian Express*. https://indianexpress.com/article/education/gender-gap-science-technology-stem-learning-widens-female-intake-rises-iit-admissions-doubled-jee-main-2026-advanced-unesco-10525028/

This study, therefore, investigates the barriers faced by women inventors in accessing IP protection, with an emphasis on legal, institutional, socio-economic, and cultural factors that shape women's experiences. By centring women's voices and experiences, the research seeks to inform both academic understanding and practical strategies for advancing gender equity in the innovation landscape.

Even though women's contributions to innovation, science, and entrepreneurship are increasingly acknowledged, women inventors are still greatly underrepresented in intellectual property systems, especially in patent filings and commercialisation. Although legal frameworks governing intellectual property are formally gender-neutral, women continue to face structural, institutional, socio-economic, and cultural barriers that hinder their ability to access, understand, and effectively utilize IP protection mechanisms.

Accordingly, the research problem addressed in this study is:

What are the key barriers faced by women inventors in accessing intellectual property protection, and how can legal and institutional frameworks be made more gender-responsive to promote inclusive innovation?

INTELLECTUAL PROPERTY LAWS IN INDIA

There exists a wide and comprehensive framework of intellectual property laws in India governing various forms of creative and inventive activity, including copyrights, patents, trademarks, industrial designs, geographical indications, plant varieties, and semiconductor integrated circuit layout designs[27], to promote innovation, creativity, and economic growth. This multifaceted regime reflects the country's effort to align domestic legislation with international standards while responding to the needs of a rapidly evolving knowledge economy. By providing distinct forms of protection tailored to different categories of intellectual output, the framework seeks to encourage investment in research and development, facilitate technology transfer, and enhance competitiveness in global markets. At the same time, it aspires to balance the interests of creators with varying concerns such as access, dissemination of knowledge, and public welfare. India's intellectual property framework has also developed in close engagement with the international legal order. As a member of the World Trade Organisation[28], India is bound by the TRIPS Agreement [29], which sets minimum

[27] Staff Writer. (2026, February 7). *Intellectual property law in India: Innovation and rights*. RTIwala. https://rtiwala.com/content/intellectual-property-law-in-india-innovation-and-rights/

[28] Kanoonpedia. (2025, April 20). *Intellectual property rights post-TRIPS agreement*. Kanoonpedia. https://kanoonpedia.com/intellectual-property-rights-post-trips-agreement/

[29] Borah, A. (2024, April 10). *The impact of TRIPS Agreement on Indian intellectual property law*. Legal Vidhiya. https://legalvidhiya.com/the-impact-of-trips-agreement-on-indian-intellectual-property-law/ (accessed February 10, 2026) (legalvidhiya.com)

standards for the protection and enforcement of intellectual property rights. In addition, India participates in various treaties administered by the World Intellectual Property Organization (WIPO)[30], facilitating cooperation, harmonisation of procedures, and cross-border recognition of rights. These international commitments influence domestic reforms, modernization of administrative practices, and the adoption of global best practices, ensuring that India's IP regime remains responsive to both national priorities and international obligations.

Copyrights: Copyright law forms part of intellectual property law and protects original works by giving creators control over their use and distribution. The Copyright in India is governed by the Copyright Act 1957.[31] It permits creators to derive commercial value from their works while promoting broader creative and innovative work. It safeguards only the expression of an idea, not the idea. The rights are generally good for a term of 60 years, though different kinds of works have varying terms.[32]

Trademarks: A trademark refers to a mark that can be visually represented and can distinguish the goods or services of one person from those of others.[33] After registration, a trademark is valid for 10 years and can be renewed from time to time.

A registered trademark confers exclusive rights on its owner and restricts others from using similar marks that could cause confusion among consumers. This protection helps businesses preserve their brand identity and goodwill.[34]

Patents: Patent law grants an inventor an exclusive legal right from the government for a limited period in return for disclosing the invention to the public. This right restricts others from making, using, selling, or reproducing the patented invention without authorization. The Indian Patents Act, 1970[35] confers exclusive patent rights for a period of twenty years from the

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[30] World Intellectual Property Organization. (2019, June 7). *India joins three key WIPO international classification treaties*. https://www.wipo.int/portal/en/news/2019/article_0021.html (accessed February 12, 2026) (wipo.int)

[31] Government of India, Ministry of Commerce & Industry. (1957). *The Copyright Act, 1957* (PDF). Copyright Office. https://copyright.gov.in/documents/copyrightrules1957.pdf

[32] The Legal School. *Copyright law in India: Meaning, history, objectives, nature & copyright infringement*. TheLegalSchool.in. https://thelegalschool.in/blog/copyright-law-in-india

[33] Kumar, A. (2025, August 7). *What can and can't be registered as a trademark in India*. QuickCompany. https://www.quickcompany.in/articles/What%20can%20be%20trademarked%20in%20India,%20trademark%20registration%20India,%20registrable%20trademarks,%20types%20of%20trademarks%20India,%20non-traditional%20trademarks,%20trademark%20eligibility%20India,%20Indian%20trademark%20law,%20brand%20name%20registration

[34] Legismith Partners LLP. (2025, April 16). *Trademark registration in India: A complete guide 2025*. Legismith. https://legismith.com/trademark-registration-in-india/

[35] World Intellectual Property Organization . *The Patents Act, 1970 (India) – WIPO Lex*. WIPO Lex: IP Laws, Treaties & Judgments. https://www.wipo.int/wipolex/en/legislation/details/22960/ (wipo.int)

date of filing. Such exclusive protection promotes innovation, safeguards intellectual property, and contributes to economic growth, among other advantages.[36]

Industrial Designs: In India, industrial designs are registered and protected under the Designs Act, 2000 [37], which provides legal protection to novel and original features relating to shape, configuration, surface patterns, ornamentation, or the arrangement of lines or colours applied to an article, provided such features are visually appealing in the finished form.[38]

Trade Secrets: A trade secret is defined as any information that is not generally known or easily accessible to others and provides a competitive edge to its holder[39]. Although Indian intellectual property laws do not expressly recognise trade secrets, indirect protection is available through certain legal provisions. For example, remedies under the Trademarks Act, 1999[40] relating to unfair competition may be invoked where a competitor misappropriates confidential information to gain an unfair commercial advantage.[41]

Geographical Indications: Geographical indications (GIs)[42] constitute a significant category of intellectual property that provides legal protection to products originating from a specific geographical region, thereby ensuring their authenticity, quality, and unique characteristics. GIs hold considerable value in safeguarding traditional knowledge, promoting rural development, and enhancing economic opportunities for local communities and nations.[43] The Geographical Indications of Goods (Registration and Protection) Act, 1999, which came into effect in 2003, provides for the registration and better protection of geographical indications relating to goods .[44]

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[36] Singh, S. (2025, February 15). *Understanding patent law in India — A comprehensive guide*. LawArticle. https://lawarticle.in/understanding-patent-law-in-india-a-comprehensive-guide/
[37] Wahab, M. I. (2025, November 17). *The Designs Act, 2000: A comprehensive overview of industrial design protection in India*. Legal Service India. https://www.legalserviceindia.com/Legal-Articles/the-designs-act-2000-a-comprehensive-overview-of-industrial-design-protection-in-india/
[38] Office of the Controller General of Patents, Designs & Trade Marks. (2024). *Designs*. Intellectual Property India. https://ipindia.gov.in/designs/designs
[39] The Legal School. *Trade secrets: FAQs and protection* (blog). The Legal School. https://thelegalschool.in/blog/trade-secrets
[40] Shivam. (2025, November 9). *The Trademarks Act, 1999 – Executive summary and bare act*. Corrida Legal. https://corridalegal.com/the-trademarks-act-1999-executive-summary-and-bare-act/
[41] Vadehra, S., Mittal, S., & Bishnoi, R. (2025, May 12). *Trade secret protection in India: A comprehensive overview*. Kan and Krishme. https://kankrishme.com/trade-secret-protection-in-india-a-comprehensive-overview/
[42] Guidely. (2025, November 6). *List of geographical indication tags in India*. Guidely. https://guidely.in/blog/list-of-geographical-indication-tags-in-india (guidely.in)
[43] Rana, A. (2025). *Geographical indications in India: Strengthening legal protection and empowering rural communities*. *Indian Journal of Legal Review (IJLR), 5*(1), 898–903. https://doi.org/placeholde
[44] Geographical Indications of Goods (Registration and Protection) Act, 1999, No. 48, Acts of Parliament, India (1999). Retrieved from https://www.indiacode.nic.in/bitstream/123456789/1981/5/A1999-48.pdf

Bio-Diversity: In response to biodiversity degradation and the need to regulate access to biological resources, the Government of India enacted the Biological Diversity Act, 2002 [45], in furtherance of its obligations under the Convention on Biological Diversity. The legislation aims to conserve biological diversity, ensure its sustainable use, facilitate fair and equitable benefit-sharing, and safeguard traditional knowledge along with the rights of local and indigenous communities .[46]

Semiconductor integrated circuit layout designs: The Semiconductor Integrated Circuits Layout-Design Act, 2000[47], establishes the statutory mechanism for safeguarding the layout designs of integrated circuits, encouraging technological advancement and innovation within India's semiconductor sector. The legislation is consistent with the obligations laid down under the TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement, which mandates member states to protect such designs.[48]

Taken together, these measures create a structured legal environment aimed at encouraging creativity, rewarding inventiveness, and ensuring that innovators are able to derive economic and moral benefits from their work. The framework reflects India's commitment to balancing private rights with public interest while fostering a culture of research, development, and technological progress. At the same time, the real strength of this legal architecture lies in how effectively it can be accessed and utilized by diverse sections of society.

A framework, however comprehensive in design, achieves its purpose only when innovators are aware of their rights, supported in navigating procedures, and capable of enforcing entitlements without excessive burdens. Persistent gaps in outreach, affordability, and institutional responsiveness may prevent certain groups particularly women and marginalized innovators from fully benefiting from the protections offered. Ensuring inclusivity in the functioning of these laws is therefore of prime importance in realising their transformative potential.

INSTITUTIONAL FRAMEWORKS FOR INTELLECTUAL PROPERTY RIGHTS IN INDIA

[45] nbaindia.org/uploaded/pdf/cleanBDACT.pdf
[46] Mulla, A. S. (2025, *month day*). *Biodiversity and the law: A dialogue for conservation*. Life & Law. https://lifeandlaw.in/biodiversity-and-the-law/
[47] Government of India, Legislative Department, Ministry of Law & Justice. (2000). *The Semiconductor Integrated Circuits Layout-Design Act, 2000* (Act No. 37 of 2000) (PDF). https://lexexcel.com/wp-content/uploads/2023/12/The-Semiconductor-Integrated-Circuits-Layout-Design-Act-2000.pdf
[48] ICT-IPR. *[Title of the blog post]*. ICT-IPR. https://ict-ipr.in/blogs_detail/22/ (accessed February 10, 2026)

India's intellectual property rights regime is supported by a well-defined institutional framework that ensures policy formulation, administration, enforcement, and adjudication of IPR. The Ministry of Commerce and Industry acts as the nodal authority, with the Department for Promotion of Industry and Internal Trade (DPIIT) [49] playing a central role in implementing the National IPR Policy, 2016, and coordinating IPR-related matters at both national and international levels. The policy adopts a comprehensive approach, covering the entire life cycle of intellectual property rights. From generating awareness to facilitating commercialisation and practical implementation, it seeks to address each critical stage systematically. It has been recognised as a balanced framework that seeks to harmonise developmental objectives with the broader public interest[50].

The Office of the Controller General of Patents, Designs and Trade Marks (CGPDTM) [51] is an agency under the Department for Promotion of Industry and Internal Trade, which administers the Indian law of Patents, Designs and Trade Marks. It administers patents, trademarks, designs, and geographical indications through specialised registries, while the Copyright Office[52] oversees copyright protection. The Copyright Office functions under the immediate control of a Registrar of Copyrights appointed by the Central Government, acting in accordance with its superintendence and directions [53]. Following the abolition of the Intellectual Property Appellate Board (IPAB) [54]. High Courts now exercise jurisdiction over IPR disputes and appeals, strengthening judicial oversight. This transition aims to streamline the adjudicatory process while promoting greater consistency and specialization in the resolution of IP disputes. High Courts are now empowered to hear patent appeals as well as revocation petitions that were earlier within the domain of the IPAB. The development has also resulted in the creation

[49] Government of India, Integrated Government Online Directory. (2026). *Department for Promotion of Industry and Internal Trade (DPIIT) — organization details*. https://igod.gov.in/organization/ZmQzG3sBNf80hyXhNfrU (igod.gov.in)
[50] Krishnan, R. *National IPR Policy 2016*. Legal Services India. https://www.legalservicesindia.com/article/2102/National-IPR-Policy-2016.html (accessed February 10, 2026)
[51] European Innovation Council and SMEs Executive Agency . *Office of the Controller General of Patents, Designs and Trade Marks (CGPDTM)*. European Union Intellectual Property Helpdesk. https://intellectual-property-helpdesk.ec.europa.eu/organisations/office-controller-general-patents-designs-and-trade-marks-cgpdtm_en (accessed February 10, 2026) (intellectual-property-helpdesk.ec.europa.eu)
[52] Copyright Office. *Copyright Office India*. Government of India. https://copyright.gov.in/ (accessed February 10, 2026)
[53] Government of India. (1957). *Copyright Act, 1957, § 9* (as amended). Ministry of Commerce & Industry, Department for Promotion of Industry and Internal Trade.
[54] Kaushik, V. (2021, May 16). *Abolishment of IPAB: Changes to the IP regime*. IIPRD. https://www.iiprd.com/abolishment-of-ipab-changes-to-the-ip-regime/

of dedicated intellectual property divisions in several High Courts, notably in Delhi and Madras, which play a significant role in strengthening judicial capacity in IP adjudication [55].

The Government of India has introduced a series of focused interventions to strengthen women's participation in intellectual property creation and protection, reflecting the broader objectives of the National Intellectual Property Rights (IPR) Policy to foster innovation, inclusivity, and equitable access to the IP system. Under the aegis of the Department of Science and Technology, programmes such as the Women Scientists Scheme-C (WISE-IPR)[56] within the WISE-KIRAN framework provide specialised training, skill enhancement, and professional pathways in patenting and IP management, thereby addressing awareness and capacity gaps among women innovators. Complementary support through fellowships, research reintegration opportunities, and infrastructure enhancement such as the Consolidation of University Research for Innovation & Excellence in Women Universities (CURIE) initiative further aligns with the Policy's emphasis on building IP awareness and facilitating commercialisation across diverse demographics. The Gender Advancement for Transforming Institutions (GATI) programme reinforces institutional reform by promoting gender-equitable practices within research organisations, supporting the Policy's mandate for inclusive innovation ecosystems. Additionally, financial incentives, including reduced fee structures offered by the Office of the Controller General of Patents, Designs and Trademarks [57], aim to lower economic barriers to IP filings for women applicants and entrepreneurs. These initiatives operationalise key tenets of the National IPR Policy by enabling greater access, participation, and benefit-sharing for women within India's intellectual property regime.[58]

Overall, these institutions and initiatives form an integrated framework aimed at promoting innovation, protecting creators' rights, and fostering a robust intellectual property ecosystem in India. Beyond their administrative and regulatory roles, these institutions are instrumental in shaping the accessibility and effectiveness of the intellectual property regime. Their

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[55] de Leon, E. A. (2023, July 31). *India post-IPAB: Should other courts also have their own IP division?* Asia I P Law. https://www.asiaiplaw.com/section/in-depth/india-post-ipab-should-other-courts-also-have-their-own-ip-division (asiaiplaw.com)

[56] Government of India, Department of Science & Technology. (n.d.). *Women Scientist Scheme-C (WOS-C)*. India Science, Technology & Innovation. https://www.indiascienceandtechnology.gov.in/programme-schemes/women-schemes/women-scientist-scheme-c-wos-c (indiascienceandtechnology.gov.in)

[57] Press Information Bureau. (2021, August 1). *Simplified patent and copyright registration helping India become an innovation hub – Piyush Goyal* [Press release]. Government of India. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1741227&reg=3&lang=2

[58] Office of the Controller General of Patents, Designs & Trade Marks. (2025). *India's initiatives: Enhancing women's participation in innovation & IPR* [PDF]. Intellectual Property India, Government of India. https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Publication_Women_in_IP.pdf (accessed February 10, 2026)

functioning determines how easily innovators can navigate procedures, obtain guidance, secure timely protection, and enforce their rights. While the framework has evolved to encourage efficiency, digitisation, and transparency, disparities in awareness, resources, and institutional outreach continue to affect different groups in unequal ways. In particular, women innovators often encounter additional structural and socio-economic constraints that limit their ability to fully benefit from the opportunities offered by the system. Therefore, critically evaluating institutional performance on the parameters of inclusivity becomes essential for building a truly participatory and innovation-driven IP ecosystem.

BARRIERS TO ACCESSING IP PROTECTION

Women possess immense innovative potential, yet their participation in intellectual property regimes remains constrained by multiple legal, financial, and institutional barriers. [59]. These challenges are further aggravated by restricted access to networks, markets, and decision-making spaces that shape innovation ecosystems. Consequently, women's contributions often remain invisible, under-recognized, or inadequately commercialized. Addressing these disparities requires sustained attention to gender-responsive policies, simplified administrative mechanisms, and stronger institutional support structures that can enable women not merely to enter the system but to benefit from it meaningfully. A few such barriers faced by them are discussed below:

LACK OF AWARENESS AND LEGAL LITERACY REGARDING IP RIGHTS

A significant barrier to effective utilization of intellectual property rights is limited awareness[60] and legal literacy surrounding IP laws, particularly among women and marginalised innovators. WIPO Pulse 2025 findings reveal variations in awareness levels across regions. The survey highlights region-specific and demographic-specific patterns in awareness of intellectual property rights among women and youth, indicating that progress is uneven and highly contextual. Overall, the findings suggest that while global awareness of IP rights is improving, the nature and extent of this improvement vary significantly across regions and across different forms of IP protection [61].The lack of awareness and legal literacy regarding IP rights acts as a

[59] Soni, B. (2024, October 4). *Women and IP: Accelerating innovation and creativity*. SonisVision. https://www.sonisvision.in/blogs/women-and-ip-accelerating-innovation-and-creativity/
[60] Confederation of Indian Industry – Intellectual Property Rights (CII-IPR). (2025). *Women in IP compendium*. https://www.ciiipr.in/pdf/Women%20in%20IP%20Compendium%2013-12-2025%20Printable.pdf (ciiipr.in)
[61] World Intellectual Property Organization. (2025). *WIPO Pulse 2025: Findings*. https://www.wipo.int/web-publications/wipo-pulse-2025/en/findings.html

serious deterrent for women limiting their ability to protect, commercialize, and fully benefit from their creative and innovative contributions.

FINANCIAL CONSTRAINTS ASSOCIATED WITH FILING AND MAINTAINING IP REGISTRATIONS

The expenses involved in obtaining and maintaining intellectual property rights are complex and differ significantly based on the nature of the IP, the jurisdictions covered, and the strategic choices of the rights holder.[62] Financial constraints often hold back women from filing and maintaining IP registrations. Many able but financially weak women give up their desire to obtain intellectual property rights because of the huge expenditure involved in the process of securing intellectual property rights.[63] Beyond the initial filing fees, additional costs such as attorney charges, prior art searches, responses to examination reports, translations, renewals, and enforcement expenditures can accumulate rapidly. Women entrepreneurs, start-ups, and independent inventors frequently operate with limited access to credit, investment networks, or collateral, making it difficult to sustain long-term IP strategies. The perception that protection is expensive and time-consuming may therefore discourage women from even initiating the process. Consequently, many innovations either remain unprotected or enter the market without adequate legal safeguards, reducing opportunities for commercialization and financial returns.

PROCEDURAL COMPLEXITIES

The process of securing intellectual property rights is complex and technical. It is difficult for women to understand this complicated procedure and navigate through the process of prolonged application filing[64], insufficient access to legal representation, and a lack of awareness and understanding of intellectual property laws and regulations[65] . These procedural hurdles often create delays, increase dependency on intermediaries, and raise the overall cost of seeking protection. For many women, particularly first-time applicants or those operating in

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[62] FasterCapital. (2025, March 31). *IP cost and expense: IP expenses demystified – How to budget and plan for intellectual property*. FasterCapital. https://fastercapital.com/content/IP-cost-and-expense--IP-Expenses-Demystified--How-to-Budget-and-Plan-for-Intellectual-Property.html

[63] Shaariqah, S. (2025). *The intersection of intellectual property rights and women empowerment: Legal challenges and opportunities*. *International Journal of Law Management & Humanities, 8*(2), 1138–1155. https://doi.org/10.10000/IJLMH.119160

[64] Tiwari, L. B. (2025). *The role of intellectual property rights in empowering women entrepreneurs*. International Journal of Advance and Applied Research, *6*(13), 1—-. https://doi.org/10.5281/zenodo.14912798

[65] Johns, M. (2024). *Challenges faced by women in protecting intellectual property rights* (Vol. 7, Issue 1, pp. 704–711). *International Journal of Law Management & Humanities*. https://ijlmh.com/wp-content/uploads/Challenges-Faced-by-Women-in-Protecting-Intellectual-Property-Rights.pdf

small or informal enterprises, the technical language and documentation requirements can appear intimidating and exclusionary. The absence of simplified guidance, user-friendly interfaces, and readily available advisory support further discourages engagement with the system. As a result, promising innovations may remain unregistered, depriving women of both recognition and potential economic returns.

LIMITED INSTITUTIONAL SUPPORT

There is limited institutional support available to women in the form of dedicated IP facilitation centres, financial help [66], affordable legal assistance, mentorship, guidance, networking opportunities[67] and capacity-building initiatives. The absence of gender-responsive institutional mechanisms and outreach efforts makes it difficult for women to access timely guidance, navigate complex IP procedures, and effectively protect and commercialise their intellectual property, thereby reinforcing existing gender disparities in the IP ecosystem [68]. This gap not only discourages many potential women innovators from seeking protection but also results in the under-representation of women in patent filings, technology transfer, and entrepreneurial ventures. Without sustained institutional backing, women are often compelled to rely on informal networks or abandon the registration process altogether.

PERSISTENT GENDER BIASES WITHIN INNOVATION ECOSYSTEMS

Gender bias discourages women from accessing IP Protections. There are ample instances where women have contributed significantly to an invention and have not been recognised for it, whereas all the recognition and monetary benefits have disproportionately accrued to men[69]. Throughout history, there are ample instances of women like Elizabeth Magie who invented The Landlord's Game the board game that was the precursor to Monopoly, Vera Rubin the pioneering astronomer whose work provided evidence for dark matter, the contributions of Rosalind Franklin to DNA structure photography, Hedy Lamarr to the development of wireless communication, and Katherine Johnson to the calculations critical to the moon, did not receive

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[66] Jishnu, L. (2024, November 22). *The patent truth about women inventors*. Down To Earth. https://www.downtoearth.org.in/science-technology/the-patent-truth-about-women-inventors

[67] Neves, J. (2024, May 30). *Networking in IP: The challenges and solutions for women*. Licks Attorneys. https://www.lickslegal.com/articles/networking-in-ip-the-challenges-and-solutions-for-women

[68] Anushka, A. (2025, March 7). *Women and intellectual property: Closing the gender gap in innovation and business*. Rouse. https://rouse.com/insights/news/2025/women-and-intellectual-property-closing-the-gender-gap-in-innovation-and-business

[69] Kalia, S. (2023, June 2). *What challenges do women face in protecting intellectual property rights?* The Hindu. https://www.thehindu.com/sci-tech/technology/what-challenges-do-women-face-in-protecting-intellectual-property-rights/article66799666.ece (accessed 3 February 2026).

the recognition they deserved.[70]. Together, these examples highlight the persistent gender biases that have historically marginalised women's achievements and denied them due recognition. Despite notable progress in achieving gender equality, significant disparities continue to exist in patenting activities and in women's capacity to commercialize their creative and innovative work [71].

Women inventors worldwide constituted roughly 17.7% of the individuals listed in published Patent Cooperation Treaty (PCT) applications in 2023 [72], underscoring the continuing gender imbalance that characterises global innovation ecosystem. Addressing the barriers faced by women in accessing intellectual property protection is essential to creating an inclusive and equitable innovation ecosystem that recognises, protects, and rewards women's contributions.

SUGGESTIONS FOR STRENGTHENING WOMEN'S ACCESS TO INTELLECTUAL PROPERTY PROTECTION

There is a growing need to strengthen women's access to intellectual property protection to ensure equity, encourage innovation, and promote inclusive economic growth[73]. Addressing structural, institutional, and socio-economic barriers requires targeted and gender-responsive interventions. Such interventions must move beyond formal equality and focus on creating practical pathways through which women can meaningfully engage with intellectual property systems. This involves expanding outreach efforts, improving affordability, strengthening mentorship networks, and embedding gender sensitivity within institutional practices. By adopting a holistic approach that integrates legal reform with capacity building and financial facilitation, policymakers can ensure that women innovators are not merely participants but equal stakeholders in the knowledge economy. A responsive and inclusive IP framework has the potential to unlock untapped talent, stimulate entrepreneurship, and contribute to broader goals of social justice and sustainable development.

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[70] TOI Lifestyle Desk. (2024, August 22). *Groundbreaking inventions wrongly attributed to men: The overlooked contributions of women in history*. *Times of India*. https://timesofindia.indiatimes.com/etimes/trending/groundbreaking-inventions-wrongly-attributed-to-men-the-overlooked-contributions-of-women-in-history/articleshow/112681460.cms

[71] Innovation Council. (2024). *Closing innovation and intellectual property diversity gaps: Summary*. Innovation Council. https://innovationcouncil.org/closing-the-gender-gap-in-intellectual-property-ip/ (innovationcouncil.org)

[72] World Intellectual Property Organization.*Women and intellectual property*. https://www.wipo.int/en/web/women (accessed February 12, 2026) (wipo.int)

[73] Stacey, B. H. (2024, June 21). *Closing the gender gap in intellectual property: Women and the Sustainable Development Goals connection.* FemmeForte Uganda. https://www.femmeforteug.org/closing-the-gender-gap-in-intellectual-property-women-and-the-sustainable-development-goals-connection (accessed February 12, 2026)

GENDER-RESPONSIVE INTELLECTUAL PROPERTY POLICIES

Introducing gender-responsive intellectual property policies is essential to bridge gender gaps in innovation and transform IP regimes into effective tools for women's economic empowerment. In India, the government has taken some praiseworthy steps towards making gender responsive policies which will enable women innovators and entrepreneurs to overcome structural barriers and benefit from intellectual property rights. Capacity-building initiatives such as the Women Scientist Scheme[74], CURIE[75], Vigyan Jyoti, GATI, and other programmes implemented under the WISE (Women in Science and Engineering)[76]framework have played a significant role in promoting and strengthening women's participation in scientific research and innovation. Intellectual Property Rights (IPR) form a critical underlying component of these initiatives, as they are intrinsically linked to the innovation process. A key objective of these schemes is to foster an enabling and inclusive environment that ensures equal opportunities for women in Science, Technology, Engineering, Medicine, and Mathematics (STEMM)[77]. If these programs and initiatives are effectively implemented, they can break down barriers to gender bias and ensure greater inclusion of women in innovation and intellectual property regimes.

ENHANCED AWARENESS AND CAPACITY-BUILDING PROGRAMS

Enhanced awareness and capacity-building programmes, for women, can enable their access to IP protection. There is a strong need for tailored educational initiatives to raise the level of awareness and understanding among women regarding IP. Designing and implementing targeted educational initiatives focused on industrial designs, trademarks, layout designs, and trade secrets to address the awareness gap between male and female students in these domains can be highly useful. Such initiatives may include specialised workshops, seminars, and hands-on training modules aimed at enhancing understanding, practical knowledge, and appreciation of specific intellectual property rights concepts[78]. Further capacity-building programmes for

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[74] India Science, Technology & Innovation. *Women Scientist Scheme (WOS)*. Ministry of Science & Technology, Government of India. https://www.indiascienceandtechnology.gov.in/nurturing-minds/scholarships/women/women-scientist-scheme-wos?language=en

[75] Department of Science & Technology. (2020, March 5). *CURIE initiative of DST enhancing research facilities in women universities*. Government of India. https://dst.gov.in/pressrelease/curie-initiative-dst-enhancing-research-facilities-women-universities (accessed February 9, 2026)

[76] Department of Science & Technology. *Women in Science and Engineering-KIRAN (WISE-KIRAN)*. Government of India. https://dst.gov.in/scientific-programmes/wise-kiran (accessed February 9, 2026)

[77] Office of the Controller General of Patents, Designs & Trade Marks & Registrar of Geographical Indications. (2023). *India's initiatives: Enhancing women's participation in innovation & IPR (Women in IP)*. Intellectual Property India. https://ipindia.gov.in/writereaddata/Portal/Images/pdf/Publication_Women_in_IP.pdf

[78] Devasena, S. V. (2024). *Bridging the gap: A comparative analysis of intellectual property rights awareness and institutional initiatives among male and female engineering college students* (Major Research Project,

proper mentorship[79],guidance, training and networking opportunities can help women to have easy access to IP processes.

SIMPLIFIED AND ACCESSIBLE IP REGISTRATION PROCEDURES

The simplification of IP registration procedures and improving their accessibility for women can help make the intellectual property system more inclusive and equitable. Streamlined processes, reduced costs, user-friendly digital platforms, and targeted guidance mechanisms would enable women innovators, entrepreneurs, and researchers to navigate the system with greater confidence. Such measures can reduce procedural barriers, address informational asymmetries, and enhance women's ability to secure, manage, and commercialize their creations. In the long run, accessible IP frameworks can promote gender-balanced participation in innovation ecosystems and strengthen women's economic agency.

TARGETED INSTITUTIONAL SUPPORT FOR EQUITABLE IP PROTECTION

The limited institutional support for women often leaves them struggling through the complex system with little success. Dedicated mentoring networks, accessible legal assistance, financial facilitation, and specialised advisory services should be established to guide women innovators at every stage of the registration process. Outreach initiatives and gender-sensitive helpdesks can further improve awareness, reduce procedural hesitation, and encourage greater participation. Such support is essential for dismantling structural barriers and ensuring equitable representation of women within the intellectual property ecosystem.[80]

LEGAL AID FOR WOMEN FACING CHALLENGES

Women who encounter legal or procedural difficulties in securing intellectual property protection should be able to access timely and effective legal assistance. In India, an institutional framework already exists in the form of Legal Services Authorities[81] at the national, state, district, and taluk levels, which are mandated to provide free legal aid to eligible

funded by TANSCHE). *Educational Administration: Theory and Practice, 30*(1), 1264–1268. https://doi.org/10.53555/kuey.v30i1.6129

[79] World Intellectual Property Organization. (2026, January 20). *Mentoring for success – Building a future of women innovation leaders*. WIPO. https://www.wipo.int/en/web/women/w/news/2026/mentoring-for-success-building-a-future-of-women-innovation-leaders

[80] Jaychander, N. (2025, April 23). *Intellectual Property Day: Women's rights and challenges*. Her Circle. https://www.hercircle.in/engage/career/career/intellectual-property-day-womens-rights-and-challenges-9100.html

[81] National Legal Services Authority. *The Legal Services Authorities Act, 1987*. Government of India. https://nalsa.gov.in/the-legal-services-authorities-act-1987/ (accessed February 10, 2026)

women[82]. Strengthening coordination between IP offices and these authorities, creating specialised IP support cells, and improving awareness about the availability of such services can significantly enhance women's ability to claim and enforce their rights[83]. Accessible legal aid can reduce financial burdens, build confidence, and ensure that women are not excluded from the innovation ecosystem due to a lack of resources or representation.

CONCLUSION

The study examines the position of women within the intellectual property framework and aims to understand the barriers that shape their access to protection and participation. The analysis points out that despite gradual policy recognition and the presence of supportive schemes, structural, procedural, and institutional constraints continue to limit women's effective engagement with the IP system. Addressing these gaps requires sustained commitment toward gender-responsive reforms, simplified processes, improved awareness, and stronger support mechanisms. The significance of advancing women's participation in intellectual property is also reflected at the global level. World Intellectual Property Day observed on 26 April,2023[84], was dedicated to recognising the contributions of women innovators and creators, underscoring the urgent need to build inclusive IP ecosystems worldwide. Ensuring the valuable inclusion of women is not only a matter of fairness but also essential for fostering innovation, creativity, and equitable economic development. The future can be bright and positive for the nation as a whole if women are provided adequate support, assistance and reinforcement to reach greater heights of success and to contribute meaningfully to national progress in IP fields. When women are empowered to protect and commercialise their creations, the benefits extend beyond individual achievement to broader economic growth, social development, and global competitiveness.



[82] Under Section 12 of the Legal Services Authorities Act, 1987 (Government of India, 1987), women are entitled to receive free legal services irrespective of income.
[83] More, H. (2024, September 16). *Entitlement to legal services under the Legal Services Authorities Act, 1987*. The Legal Quotient. https://thelegalquotient.com/alternate-dispute-resolution/legal-services-authorities-act/entitlement-to-legal-services-under-the-legal-services-authorities-act-1987/4884/
[84] Feriti, I. (2023, April 26). *2023 World Intellectual Property Day: Women Year*. Brevettinews. https://brevettinews.it/en/notes/2023-world-intellectual-property-day-women-year/ (brevettinews.it)

CAN ARTIFICIAL INTELLIGENCE CREATE? A CRITICAL EXAMINATION OF ORIGINALITY, AUTHORSHIP, AND COPYING IN AI-GENERATED WORKS

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Dr. Tejasvi Sharma**

ABSTRACT

Artificial intelligence can now create music, art, and literature that closely resembles human work. This development creates serious problems for copyright law, which has always assumed that only humans can be authors. This paper examines whether AI can truly "create" in the legal sense and explores who should own the rights to AI-generated content. The study analyzes court decisions and legal guidelines from the United States, European Union, China, and India. The findings show that different countries take different approaches. American and European courts insist that copyright protection requires human authorship. The Thaler v. Perlmutter case in the US and the Cofemel case in Europe both rejected copyright for purely AI-generated works. Chinese courts, however, have shown more flexibility, granting protection when human input; such as creative prompts and careful selection; shapes the final output. The paper also addresses deeper questions. Could an AI system ever be considered a legal author? Current philosophical and scientific limitations make this unlikely, as we cannot determine whether machines possess consciousness or genuine creativity. The authors propose practical solutions, including a new type of legal protection specifically designed for AI-generated works, clear rules for disclosing AI involvement, and international cooperation to create consistent standards. Copyright law must adapt to technological change while preserving its core purpose: encouraging human creativity for public benefit.

KEYWORDS: Artificial Intelligence; Originality; Authorship; Copyright; AI-Generated Works.

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INTRODUCTION

The rapid advancement of artificial intelligence has fundamentally altered the creative landscape, challenging traditional copyright frameworks that have historically centered on human authorship and original creation[85]. As AI systems autonomously generate increasingly sophisticated music, literature, and visual art, longstanding copyright principles face unprecedented legal and philosophical strain regarding the definition of authorship and ownership[86]. It evaluates emerging case law and regulatory proposals while advocating for a sui generis legal regime that addresses the realities of autonomous creativity, safeguards human innovation, and ensures equitable rights allocation in the digital era. Specifically, the proliferation of generative algorithms capable of producing literary, musical, and artistic works without direct human intervention necessitates a critical re-evaluation of established intellectual property paradigms[87]. Core copyright doctrines, particularly the requirements of human authorship and originality derived from an identifiable creator, are increasingly difficult to reconcile with the abstract reality of autonomous machine generation[88]. Current jurisprudence predominantly reflects a consensus that works generated autonomously by AI lack the requisite human creative input to qualify for copyright protection, thereby leaving such outputs in the public domain[89]. This judicial stance is deeply rooted in the conviction that copyright law is designed to incentivize human ingenuity, preserving a conceptual space where the special quality of human creativity remains distinct from machine-generated output[90]. However, some scholars argue that AI can be as equally creative as human beings as they follow the same laws of cultural production, suggesting that the modern copyright regime's entanglement with the 18th-century concept of exceptional individual genius may require a fundamental ideological reconstruction[91]. To operationalize this reconstruction, legal systems must develop more nuanced standards for recognizing authorship in AI-assisted works, shifting

[85] Gaidartzi, A., & Stamatoudi, I. A. (2025). Authorship and Ownership Issues Raised by AI-Generated Works: A Comparative Analysis. *Laws*, *14*(4), 57. https://doi.org/10.3390/laws14040057
[86] Katabi, M. R. (2025). Beyond Human Authorship: Rethinking Copyright Ownership in the Age of Autonomous Artificial Intelligence. *East African Journal of Law and Ethics*, *8*(1), 279. https://doi.org/10.37284/eajle.8.1.3580
[87] GAFFAR, H., & Albarashdi, S. H. (2024). Copyright Protection for AI-Generated Works: Exploring Originality and Ownership in a Digital Landscape. *Asian Journal of International Law*, 1. https://doi.org/10.1017/s2044251323000735
[88] ibid
[89] Hardman, B., & Housel, J. (2023). A Sui Generis Approach to the Protection of AI-Generated Works: Balancing Innovation and Authorship. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4557004
[90] Geiger, C. (2023). Elaborating a Human Rights friendly Copyright Framework for Generative AI. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4634992
[91] Xiao, Y. (2022). Decoding Authorship: Is There Really no Place for an Algorithmic Author Under Copyright Law? *Deleted Journal*, *54*(1), 5. https://doi.org/10.1007/s40319-022-01269-5

focus from the initial generation of content to the subsequent creative choices made by human users who select, arrange, or substantially modify the algorithm's output[92]. This approach recognizes two primary instances where copyright protection may be justified: when a human artist intentionally selects or organizes AI-created content to form an original composition, and when an artist substantially alters content originally produced by AI such that these alterations meet standard copyright criteria[93]. The United States Copyright Office exemplifies this perspective, maintaining that works produced by a machine operating "randomly or automatically without any creative input or intervention from a human author" are ineligible for registration, thereby necessitating an assessment of whether traditional elements of authorship, such as conception and execution, originated from a human or the machine[94] . The CJEU has further reinforced this anthropocentric requirement in cases such as ***Cofemel – Sociedade de Vestuário SA v G-Star Raw CV***, establishing that if a work's realization is dictated by technical constraints or rules that permit no creative freedom, it cannot satisfy the originality threshold for copyright protection . This precedent underscores the broader jurisprudential principle that originality is inextricably linked to the author's intellectual contribution, requiring that protected works reflect the author's free and creative choices rather than mere mechanical execution[95]. The concept of originality varies significantly across jurisdictions, yet it remains a fundamental prerequisite for copyright protection that demands intellectual creation resulting from the author's free and creative choices. The United States Supreme Court has consistently interpreted this requirement strictly, defining an author as the "originator" to whom a work owes its origin and emphasizing that copyright protection is limited to creations stemming from human creativity and intellectual effort[96]. This strict interpretation has been applied to AI-generated outputs, as evidenced by the United States Copyright Office's refusal to register works like Thaler's *A Recent Entrance to Paradise* on the grounds that human intervention is a sine qua non condition for protection, a stance

[92] GAFFAR, H., & Albarashdi, S. H. (2024). Copyright Protection for AI-Generated Works: Exploring Originality and Ownership in a Digital Landscape. *Asian Journal of International Law*, 1. https://doi.org/10.1017/s2044251323000735

[93] Mei, Y. (2024a). Prompting the E-Brushes: Users as Authors in Generative AI. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4751625

[94] Kamocki, P., Bond, T., Lindén, K., Margoni, T., Kelli, A., & Puksas, A. (2024, July 9). Mind the Ownership Gap? Copyright in AI-generated Language Data. *Linköping Electronic Conference Proceedings*. https://doi.org/10.3384/ecp210008

[95] Supra f.n. 8

[96] Supra f.n. 8

similarly upheld in the EU through rulings such as *Cofemel* which require that Works reflect the author's free and creative choices[97].

LITERATURE REVIEW

Current jurisprudence predominantly reflects a consensus that works generated autonomously by AI lack the requisite human creative input to qualify for copyright protection, thereby leaving such outputs in the public domain. This judicial stance is deeply rooted in the conviction that copyright law is designed to incentivize human ingenuity, preserving a conceptual space where the special quality of human creativity remains distinct from machine-generated output[98]. The longstanding judicial emphasis on human authorship is often justified by the necessity of protecting the fruits of intellectual labor, a principle reinforced by decisions from the United States Copyright Office affirming that copyright can only protect creations resulting from human creativity[99]. In ***Thaler v. Perlmutter***, the United States District Court for the District of Columbia upheld the Copyright Office's denial of registration for AI-generated visual art, ruling that a work must be the result of human authorship to receive protection under the Copyright Act of 1976 and the Copyright Clause of the Constitution[100] . The court highlighted the constitutional intent that copyright protection is designed to incentivize human ingenuity, thereby excluding non-human entities from being recognized as authors within this legal framework[101]. Conversely, the Beijing Internet Court has diverged from this anthropocentric trend by acknowledging the protectability of images generated by Stable Diffusion, emphasizing the critical role of prompt engineering and parameter settings in determining the originality of the resulting work[102] . This decision marks a significant departure from the prevailing consensus in Western jurisdictions, suggesting that the intellectual effort involved in crafting specific prompts and configuring generation parameters may satisfy the threshold for originality even when the pixel-level execution is performed by an algorithm[103]. Scholars examining this emerging landscape have debated the cognitive agency of AI systems,

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[97] Hugenholtz, P. B., & Quintais, J. P. (2021). Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output? *Deleted Journal*, *52*(9), 1190. https://doi.org/10.1007/s40319-021-01115-0

[98] Supra f.n. 8

[99] Mukherjee, A., & Chang, H. H. (2025). Charting the Parrot's Song: A Maximum Mean Discrepancy Approach to Measuring AI Novelty, Originality, and Distinctiveness. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2504.08446

[100] Al-Sharieh, S. (2025). Copyright Denied for Generative AI: Remarks on Thaler v Perlmutter. *Utrecht Journal of International and European Law*, *40*(1), 48. https://doi.org/10.5334/ujiel.644

[101] Supra f.n. 8

[102] Zollinger, A. (2024). Creations generated by artificial intelligence in literary and artistic property: the new death of the author? *Eastern Journal of European Studies*, *15*(2), 257. https://doi.org/10.47743/ejes-2024-0213

[103] Амповска, M. (2025). Judicial Responses to AI-Generated Works: A Comparative Case Law Analysis on Copyright. *Review of European and Comparative Law*, *62*(3), 107. https://doi.org/10.31743/recl.18615

with some arguing that current AI lacks genuine creative independence because its outputs are strictly determined by human-programmed instructions, positioning the technology closer to a sophisticated amanuensis than a true author[104]. This perspective posits that while AI systems may functionally mimic creative processes, they ultimately lack the autonomy and free will necessary for independent authorship, a view supported by legal frameworks that distinguish between human-generated and machine-assisted creativity[105]. Despite the general exclusion of purely autonomous generation, an alternative perspective suggests that copyright may be applicable when humans collaborate with AI during the creative process, as evidenced by the 2019 Dreamwriter Case in China where the Shenzhen Nanshan District Court recognized protection for AI-generated news articles due to substantial human contributions in data selection and algorithm design[106]. Compared to traditional assisting tools for creation such as a camera, humans have less control and understanding of the creative process in the context of generative AI[107]. This erosion of creative control creates a situation where the user relies on the AI's automated processing with minimal input, a dynamic that mirrors the legal uncertainties surrounding point-and-shoot photography where the extent of human agency determines copyrightability[108]. The U.S. Copyright Office has reinforced this standard by refusing to register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author, arguing that prompts function more like instructions to a commissioned artist rather than ultimate creative acts[109]. This analogy suggests that the user identifies what they wish to have depicted, but the machine ultimately determines the specific implementation of those instructions, thereby distinguishing the interpretative autonomy of the AI model from the direct physical control characteristic of traditional artistic instruments[110]. This delegation of aesthetic decisions implies that elements such as style, pattern, and structure are autonomously determined by the model rather than the user, preventing the generated image from originating

[104] Supra f.n. 15
[105] Supra f.n. 16
[106] Weuts, R., Bleher, J., Bleher, H., Flores, R., Xuanyang, G., Pujszo, P., & Almási, Z. (2025). AI Governance in Higher Education: A course design exploring regulatory, ethical and practical considerations. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2509.06176
[107] Berbec, A. (2025). Intent, control and creative freedom in AI- Supported Output: Lessons from Photography. *SCRIPTed A Journal of Law Technology & Society*, *22*(1), 4. https://doi.org/10.2218/scrip.22.1.2025.11648
[108] ibid
[109] Mei, Y. (2024a). Prompting the E-Brushes: Users as Authors in Generative AI. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4751625
[110] Lucchi, N. (2023). ChatGPT: A Case Study on Copyright Challenges for Generative Artificial Intelligence Systems. *European Journal of Risk Regulation*, *15*(3), 602. https://doi.org/10.1017/err.2023.59

as a direct expression of human creativity[111]. While the user's prompt may describe the desired outcome, the lack of final creative control over the system's interpretation and content creation has led authorities to conclude that such works lack sufficient human authorship for copyright protection[112]. This legal stance stands in contrast to the recognition that AI-assisted works do attract copyright protection when they involve some degree of human intervention[113]. However, defining the precise threshold at which guided control transforms into authorship remains a contentious issue, particularly given that users often lack transparency regarding the system's internal processing and final decision-making parameters[114]. The lack of transparency regarding these internal mechanisms further complicates the assessment of authorship because users are frequently unable to predict how the system will bridge the gap between their input and the final output. The U.S. Copyright Office has emphasized that because of the significant distance between what a user may direct the system to create and the material it actually produces, users lack sufficient control to be treated as the "master mind" behind the generated images[115]. Consequently, the concept of authorship is increasingly being analyzed through the lens of cognitive dissonance as users and legal systems alike struggle to reconcile the perception of AI as a creative agent with the reality that artistic tools, from brushes to complex algorithms, do not create art independently but rather serve as instruments for human artists[116]. This conceptual framing necessitates a rigorous examination of the specific criteria used to evaluate human creativity within AI-assisted workflows, particularly focusing on the dichotomy between generative autonomy and user intent. This analysis must therefore interrogate the functional limitations of the prompt mechanism itself, assessing whether the textual instructions provided by a user exercise sufficient originality to constitute the "modicum of creativity" required for copyright protection[117]. To systematically evaluate these complex questions surrounding authorship and originality, this study employs a qualitative legal analysis that examines existing judicial decisions, administrative guidelines, and

[111] Murray, M. D. (2023). Tools Do Not Create: Human Authorship in the Use of Generative Artificial Intelligence. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4501543
[112] Lee, K., Cooper, A. F., & Grimmelmann, J. (2023a). Talkin' 'Bout AI Generation: Copyright and the Generative AI Supply Chain. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4523551
[113] Saw, C. L., & Lim, D. (2025). The Case For AI Authorship In Copyright Law. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5108423
[114] Supra f.n. 23
[115] Supra f.n. 26
[116] Supra f.n. 27
[117] Supra f.n. 25

theoretical frameworks governing intellectual property rights in the context of generative AI technologies[118].

RIGHTS - WHETHER AVAILABLE TO PERSONS ONLY AND NOT TO AI ENTITIES?

While historically and legally, rights have been reserved for humans, ethical reasoning and recent legal innovations are actively challenging that exclusivity. The frontier of rights is expanding, particularly toward sentient animals and natural systems, forcing us to re-examine the very foundation of what it means to be a rights-bearing entity.

The question is no longer just "Are rights only for humans?" but "What are the morally relevant criteria for having rights, and which entities meet those criteria?" This is one of the defining ethical questions of our time. The emerging debate suggests that if personhood and intrinsic rights can indeed be decoupled from strictly biological human characteristics, the moral community may need to expand to encompass artificial intelligences and other non-human entities that demonstrate capacities such as autonomy, self-consciousness, and complex cognitive functions[119][120][121]. Within current AI ethics frameworks, scholars are increasingly interrogating whether non-carbon-based entities might be granted rights based on these capacities, despite the fact that traditional rights discourse has historically been grounded in biological consciousness[122]. This debate often centers on the philosophical problem of whether artificial intelligence can ever possess the subjective experience necessary to qualify for personhood, with some arguing that rights claims for such entities cannot be resolved without first addressing the "hard problem of consciousness."[123].Consequently, the assignment of intrinsic rights to systems remains theoretically contentious since moral rights are viewed as constitutive of personhood rather than legal fictions, creating a distinction that might grant a robot like Sophia a right against arbitrary destruction without necessarily equating to a full human right to life[124]. Some theorists propose that if these machines achieve sufficient

[118] Mazzi, F. (2024). Authorship in artificial intelligence-generated works: Exploring originality in text prompts and artificial intelligence outputs through philosophical foundations of copyright and collage protection. *The Journal of World Intellectual Property*, *27*(3), 410. https://doi.org/10.1111/jwip.12310
[119] Dall'Agnol, D., 2020. Human and nonhuman rights. Revista de Filosofia Aurora 32 55 . doi:10.7213/1980-5934.32.055.ds01
[120] Fasel, R.N., 2018. The Old 'New' Dignitarianism. Res Publica 25 4 , 531. doi:10.1007/s11158-018-09411-2
[121] Younas, A., Younas, R., 2018. Sustainability of Artificial Intelligence: Reconciling Human Rights with Legal Rights of Robots. SSRN Electronic Journal. doi:10.2139/ssrn.3164535
[122] Cheng, L., Gong, X., 2024. Appraising Regulatory Framework Towards Artificial General Intelligence (AGI) Under Digital Humanism. Deleted Journal. doi:10.1515/ijdlg-2024-0015
[123] Kiškis, M., 2023. Legal framework for the coexistence of humans and conscious AI. Frontiers in Artificial Intelligence. doi:10.3389/frai.2023.1205465
[124] Dall'Agnol, D., 2020. Human and nonhuman rights. Revista de Filosofia Aurora 32 55 . doi:10.7213/1980-5934.32.055.ds01

autonomy or moral agency, the current legal distinction between natural and legal personhood may need to accommodate a new category of artificial entities distinct from biological humans[125]. Such a classification would require establishing unique legal features and implications regarding the attribution of rights and duties, as existing categories like natural persons, legal persons, animals, or objects may prove insufficient to address the reality of sophisticated autonomous systems[126][127]. Legal personhood itself is an elastic concept created by legal systems to grant rights and responsibilities to entities when beneficial, suggesting that AI could theoretically attain this status similar to corporations or geographic features[128]. However, a critical distinction remains between conferring legal personhood for instrumental purposes; such as liability; and granting inherent moral rights grounded in consciousness or biological existence[129]. This epistemic gap regarding whether AI can possess genuine intentionality or moral status suggests that granting rights to such entities premised on these capacities may be premature without resolving the underlying "hard problem" of consciousness[130]. The difficulty of ascertaining whether non-biological entities possess subjective experience creates a fundamental barrier to resolving questions of AI personhood and moral standing[131]. Since artificial systems lack the shared biological and evolutionary heritage that allows us to reasonably infer consciousness in animals, we may be unable to circumvent this philosophical barrier when addressing the possibility of AI rights[132]. The lack of shared biological and evolutionary heritage that permits the inference of consciousness in animals means we may lack the necessary framework to determine if non-biological entities possess the subjective experience required for moral status[133]. This challenge is further complicated by the fact that current AI operates on syntactic and algorithmic principles, whereas human consciousness is posited to be quantum in nature, raising questions about

[125] Safdari, A., 2023. Person, thing, Robot: a moral and legal ontology for the 21st century and beyond: by David Gunkel. Ethics and Information Technology 25 4 . doi:10.1007/s10676-023-09731-9
[126] Harris, J., Anthis, J.R., 2021. The Moral Consideration of Artificial Entities: A Literature Review. Science and Engineering Ethics. doi:10.1007/s11948-021-00331-8
[127] Tzimas, T., 2018. Artificial Intelligence as Global Commons and the "International Law Supremacy" Principle. doi:10.2991/rais-18.2018.13
[128] Green, B.P., 2018. Ethical Reflections on Artificial Intelligence. Scientia et Fides 6 2 , 9. doi:10.12775/setf.2018.015
[129] Natural Persons, 2023. , in: The MIT Press eBooks. The MIT Press, p. 71. doi:10.7551/mitpress/14983.003.0007
[130] Harris, J., Anthis, J.R., 2021. The Moral Consideration of Artificial Entities: A Literature Review. Science and Engineering Ethics. doi:10.1007/s11948-021-00331-8
[131] Bryson, J.J., Diamantis, M., Grant, T.D., 2017. Of, for, and by the people: the legal lacuna of synthetic persons. Artificial Intelligence and Law 25 3 , 273. doi:10.1007/s10506-017-9214-9
[132] Supra F.n. 45
[133] Wright, R.G., 2019. The Constitutional Rights of Advanced Robots (and of Human Beings). Arkansas law review 71 3 , 613. doi:10.54119/alr.wzqd2139

whether artificial consciousness could emerge through self-programming or if it remains fundamentally distinct from human phenomenology[134]. The absence of shared evolutionary markers and objective criteria creates significant uncertainty about the true capabilities of non-human entities, complicating the development of ethical guidelines and regulatory frameworks for AI autonomy[135]. One significant conceptual hurdle is that questions of personhood are inextricably linked to the nature of consciousness, a genuinely open philosophical problem regarding qualitative experience that complicates but does not necessarily preclude recognizing AI systems as legal actors[136]. According to mainstream anthropocentric AI ethics, humans are currently presumed to be the only entities consciousness, agency, and autonomous decision-making derived from beliefs and values, whereas AI systems are categorized as advanced tools lacking personal experiences and operating solely based on programmed data and algorithms[137]. This bifurcation is challenged by alternative philosophical perspectives, such as the "hard problem" of consciousness and the knowledge argument, which contend that physical processes and algorithmic information processing may be insufficient to generate subjective experience, thereby casting doubt on whether artificial systems can ever truly possess the phenomenological qualities associated with personhood[138]. Consequently, the absence of shared biological and evolutionary heritage that permits the inference of consciousness in animals means we may lack the necessary framework to determine if non-biological entities possess the subjective experience required for moral status[139]. This epistemic challenge raises questions about how humans would detect or validate such consciousness in artificial systems, particularly given that current definitions of personhood are deeply rooted in biological and phenomenological assumptions that do not easily translate to non-human substrates[140]. The dominant view among researchers suggests that the first-person, subjective nature of consciousness may remain unattainable through calculations and algorithms, making it difficult to conceptualize a consciousness devoid of this phenomenological subjectivity[141].

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[134] Milczarek, E., 2023. Artificial intelligence's right to life. AI and Ethics 4 2 , 587. doi:10.1007/s43681-023-00296-3

[135] Supra F.n. 39

[136] Risse, M., 2018. Human Rights and Artificial Intelligence: An Urgently Needed Agenda. Revista Publicum 4 1 . doi:10.12957/publicum.2018.35098

[137] Supra F.n. 39

[138] Blackshaw, B.P., 2023. Artificial Consciousness Is Morally Irrelevant. AJOB Neuroscience. doi:10.1080/21507740.2023.2188276

[139] Schwitzgebel, E., Garza, M., 2020. Designing AI with Rights, Consciousness, Self-Respect, and Freedom, in: Oxford University Press eBooks. Oxford University Press, p. 459. doi:10.1093/oso/9780190905033.003.0017

[140] Browning, H., Veit, W., 2020. The Measurement Problem of Consciousness. Philosophical Topics 48 1 , 85. doi:10.5840/philtopics20204815

[141] Orbik, Z., 2024. Husserl's concept of transcendental consciousness and the problem of AI consciousness. Phenomenology and the Cognitive Sciences 23 5 , 1151. doi:10.1007/s11097-024-09993-8

Furthermore, the emergence of artificial entities possessing self-awareness or intentional capabilities would likely force a fundamental rethinking of established concepts regarding consciousness, self-consciousness, and moral agency[142]. Despite the theoretical debates surrounding these capacities, the practical determination of whether an AI system has achieved consciousness, agency, or moral status faces profound epistemological difficulties due to the lack of universal definitions and the subjective nature of human interpretations[143] These difficulties include the determination problem, where no consensus exists on which specific attributes or combination of qualities, such as rationality or sentience, should be designated as the necessary criterion for personhood[144]. Even if consciousness were settled as a requirement, profound epistemological obstacles remain in verifying whether non-biological entities possess genuine subjective experience, as we currently lack a defined methodology to distinguish between authentic AI consciousness and sophisticated simulation[145]. Crucially, a key epistemic barrier is how to interpret the experience of even a very cognitively sophisticated agent that is so differently physically instantiated, as it is unclear how we would properly comprehend the phenomenal consciousness of a machine-based agent that is disembodied and whose interactions with the world are alien to our own[146]. Furthermore, the epistemic opacity inherent in self-learning AI systems complicates the task of determining whether a technological artefact possesses phenomenal consciousness and how deep such consciousness might run[147]. This opacity is exacerbated by the absence of a general theory explaining how consciousness arises from non-conscious processes, which constitutes the "hard problem" of consciousness and leaves experts without a definitive method for empirically testing for sentience in non-human systems[148]. Nevertheless, there is currently progress in developing empirical tests, as the absence of a principled epistemic difference between testing for animal and AI consciousness suggests that validated methods for detecting consciousness in evolutionary

[142] Pagallo, U., 2017. From Automation to Autonomous Systems: A Legal Phenomenology with Problems of Accountability 17. doi:10.24963/ijcai.2017/3

[143] Dreksler, N., Caviola, L., Chalmers, D., Allen, C., Rand, A.S., Lewis, J., Waggoner, P., Mays, K.K., Sebo, J., 2025. Subjective Experience in AI Systems: What Do AI Researchers and the Public Believe? arXiv (Cornell University). doi:10.48550/arxiv.2506.11945

[144] Safdari, A., 2023. Person, thing, Robot: a moral and legal ontology for the 21st century and beyond: by David Gunkel. Ethics and Information Technology 25 4 . doi:10.1007/s10676-023-09731-9

[145] Artificial Agency, Consciousness, and the Criteria for Moral Agency: What Properties Must an Artificial Agent Have to Be a Moral Agent?, 2007. . SSRN Electronic Journal. doi:10.2139/ssrn.983503

[146] McKeown, A., 2023. Cerebral Organoid Research Ethics and Pinning the Tail on the Donkey. Cambridge Quarterly of Healthcare Ethics 32 4 , 542. doi:10.1017/s0963180123000221

[147] Ruiter, A. de, 2025. Dangerous liaisons: social AI and the problem with the relational turn to moral status. AI & Society. doi:10.1007/s00146-025-02638-7

[148] Fernandez, I., Kyosovska, N., Luong, J., Mukobi, G., 2024. AI Consciousness and Public Perceptions: Four Futures. arXiv (Cornell University). doi:10.48550/arxiv.2408.04771

distant species could potentially be adapted for artificial systems[149]. However, this adaptation faces significant limitations, as the dominant approaches to artificial consciousness often leap over the epistemic wall created by our lack of a deep explanation of consciousness, thereby compromising the evidentialist principles necessary for rigorous assessment and leaving us with a position of justified agnosticism[150]. This state of uncertainty is particularly problematic given that ethical frameworks for assigning moral status typically presuppose the presence of valenced consciousness, yet no persuasive narrative currently exists regarding how such qualitative states might emerge in artificial systems[151] . This difficulty is compounded by the fact that the physical organization of artificial systems is fundamentally removed from that of humans, making the assessment of sentience in machines even more uncertain than the disputed distribution of consciousness among biological entities[152]. The application of biological markers of consciousness to non-organic systems presents a profound epistemic challenge, leading to a position of agnosticism regarding artificial consciousness[153]. Support for this agnostic stance stems from the observation that current evidence is insufficient to determine whether AI could be conscious, leaving evidentialism as the only warranted approach until a reliable method for detecting consciousness in non-biological substrates is established[154]. The difficulty of securing such empirical verification is compounded by the philosophical worry that consciousness may simply be the kind of phenomenon that is not amenable to empirical study in principle[155].

CORE ISSUES OF AI AND COPYRIGHTS

The interaction between artificial intelligence and copyright law raises several foundational issues that challenge traditional doctrines rooted in human creativity and authorship.

HUMAN AUTHORSHIP REQUIREMENT

Copyright law across jurisdictions is premised on the assumption that a protected work must originate from a human author exercising intellectual control over the creative process[156]. The

[149] Dung, L., 2022. Why the Epistemic Objection Against Using Sentience as Criterion of Moral Status is Flawed. Science and Engineering Ethics 28 6 . doi:10.1007/s11948-022-00408-y
[150] McClelland, T., 2024. Agnosticism About Artificial Consciousness. arXiv (Cornell University). doi:10.48550/arxiv.2412.13145
[151] Wasserziehr, J.H., 2025. The Moral Ambiguity of the AI Consciousness Debate, in: Frontiers in Artificial Intelligence and Applications. doi:10.3233/faia241490
[152] Supra F.n. 65
[153] McClelland, T., 2024. Agnosticism About Artificial Consciousness. arXiv (Cornell University). doi:10.48550/arxiv.2412.13145
[154] ibid
[155] Supra F.n. 64
[156] 17 U.S.C. sec. 102(a); see also Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).

increasing capacity of AI systems to autonomously generate expressive outputs calls this assumption into question, as purely machine-generated works lack identifiable human agency traditionally required for authorship.[157]

ORIGINALITY AND CREATIVITY

While AI-generated outputs may appear novel or aesthetically valuable, they often lack human intent and conscious creative choice.[158] Most copyright regimes define originality in terms of the author's intellectual creation or creative freedom, a standard reflected in judicial interpretation in both U.S. and EU jurisprudence.[159]

LEGALITY OF TRAINING DATA

A major unresolved issue concerns the legality of using copyrighted works as training data for AI models.[160] The large-scale ingestion of protected content raises questions about infringement, licensing obligations, and the applicability of exceptions such as fair use or text-and-data-mining provisions, particularly where training occurs without the consent of rights holders.[161]

DERIVATIVE VERSUS ORIGINAL WORKS

Another doctrinal challenge lies in determining whether AI-generated outputs constitute original works or merely derivative recombination of pre-existing copyrighted material.[162] Given that generative models rely on patterns learned from existing datasets, distinguishing independent creation from impermissible derivation remains legally and technically complex.

HUMAN - AI COLLABORATION

The growing prevalence of human–AI collaborative creation further complicates authorship analysis.[163]Determining when AI functions as a tool under human direction, and when its contribution becomes substantial enough to challenge sole human authorship, remains a contentious issue in comparative copyright discourse.

COPYRIGHT LAWS

[157] U.S. Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence (2023).
[158] 17 U.S.C. sec 102(a); Copyright Act, 1957, sec. 13.
[159] Infopaq International A/S v Danske Dagblades Forening, Case C-5/08, EU:C:2009:465; Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991).
[160] World Intellectual Property Organization, Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence (2020–2023).
[161] 17 U.S.C. Sec 107 (fair use); Directive (EU) 2019/790, arts. 3–4 (text and data mining exceptions).
[162] 17 U.S.C. sec.101 (definition of derivative work).
[163] U.S. Copyright Office, Compendium of U.S. Copyright Office Practices sec. 306 (3d ed.).

Copyright law operates within a fundamental dialectic, functioning not as a simple grant of rights but as a carefully calibrated instrument of cultural and scientific policy. Its legitimacy and purpose are derived from the delicate equilibrium it must maintain between two potentially conflicting imperatives: the proprietary interests of individual creators and the broader informational and cultural needs of the public. This duality is not an internal contradiction but a symbiotic relationship, wherein the protection of the former is understood as a necessary predicate for achieving the latter. The law, therefore, constructs a framework that simultaneously incentivizes origination and ensures the eventual enrichment of the public domain.

At its core, copyright provides a legal architecture designed to translate creative labor into a limited form of property. By vesting authors with a bundle of exclusive economic rights; control over reproduction, distribution, public performance, and the creation of derivative works; the statute creates a marketable commodity from an intangible work. This commodification serves a crucial utilitarian function: it allows creators and their intermediaries to capture the economic value of their works, thereby mitigating the public goods problem inherent in intellectual creations, which are by nature non-rivalrous and easily copied. This economic incentive is posited as a necessary precondition for the sustained production and dissemination of cultural and scholarly artifacts. In certain jurisdictions, this economic focus is complemented by a recognition of the author's moral personhood, safeguarded through rights of attribution and integrity, which protect the non-economic interests tied to the creator's identity and reputation.

This grant of exclusivity, however, is not an absolute entitlement but a limited statutory privilege, granted in contemplation of a larger social good. As articulated in the constitutional lodestar of many legal systems, the ultimate aim is “To promote the Progress of Science and useful Arts.” The protection afforded to creators is thus a means to an end, a temporal incentive designed to stimulate the very creative activity that will, in due course, replenish the cultural commons. This teleological orientation finds its most concrete expression in the principle of a finite term. The deliberate expiration of copyright, after which a work irrevocably passes into the public domain, is perhaps the most profound testament to the law's ultimate fidelity to the public. It embodies the understanding that the cultural and intellectual inheritance of a society must not remain perpetually enclosed within private holdings, but must eventually become a freely accessible foundation for future creation.

The precise contours of copyright's subject matter further refine its function, delineating the boundaries between protectable expression and unprotectable ideas, facts, and methods. This distinction, often traced to the idea-expression dichotomy, ensures that copyright's monopoly does not extend to the fundamental building blocks of knowledge and innovation, which remain free for all to use. Similarly, the law explicitly excludes from its purview functional concepts, systems, and discoveries, directing them towards the more exacting requirements of patent law, and leaves short phrases and identifiers to the realm of trademark. These demarcations are essential for preventing the copyright system from overreaching and impeding, rather than fostering, intellectual and commercial progress.

To complete its equilibrium, copyright law incorporates a range of doctrinal safety valves that mediate between the proprietary right and the public interest in access and use. The doctrine of fair use, or its counterpart fair dealing, stands as the most significant of these, operating as a flexible, equitable rule of reason that permits unauthorized uses for socially valuable purposes such as criticism, scholarship, and commentary. It functions as a crucial check on the potential for copyright to stifle the very discourse it is meant to encourage. Other limitations, such as the first sale doctrine, which exhausts the distribution right after an initial lawful sale, facilitate the functioning of secondary markets and the lending practices of libraries. Compulsory licensing mechanisms, in turn, represent a pragmatic legislative compromise, permitting certain uses while ensuring a revenue stream to rights holders in situations where individual negotiation would be transactionally prohibitive. Collectively, these doctrinal mechanisms operationalize the law's inherent balancing act, ensuring that the private right remains a servant, not a master, to the public good.

INDIA

Copyright law in India is primarily governed by the Copyright Act, 1957, which provides statutory protection to original works of authorship while ensuring a balance between private rights and public interest. The Act came into force in January 1958, replacing the Indian Copyright Act of 1914 that was largely based on British legal principles. The enactment of the 1957 legislation marked an important shift towards an indigenous and comprehensive copyright regime tailored to India’s socio-economic and cultural context.

The Act protects a wide spectrum of creative expressions, including literary, dramatic, musical, and artistic works, as well as cinematographic films and sound recordings.[164] It confers

[164] Copyright Act, 1957, Section 13(1)(a)–(c).

exclusive rights upon creators, such as the right to reproduce, issue copies, adapt, translate, distribute, and communicate the work to the public. These rights are essential for recognizing authorship, ensuring economic returns, and promoting creative activity.

With respect to the duration of protection, copyright generally subsists for the lifetime of the author and continues for sixty years after their death[165]. In the case of certain categories of works, such as cinematographic films and sound recordings, the term of protection is calculated differently under the Act.[166] The time-limited nature of copyright ensures that creative works eventually enter the public domain, thereby facilitating wider access to knowledge and cultural resources.

An important feature of the Copyright Act is the inclusion of limitations and exceptions through the doctrine of "fair dealing." The Act permits limited use of copyrighted works without authorization for purposes such as private study, research, criticism, review, reporting of current events, and education.[167] Judicial interpretation has further clarified and expanded the scope of fair dealing in order to balance authors' rights with freedom of expression and public interest.[168]

The Copyright (Amendment) Act, 2012 introduced significant reforms to address challenges posed by digital technology and online dissemination of content. The amendments strengthened protection for digital works and recognized internet broadcasting. They also introduced penalties for the circumvention of technological protection measures and safeguards for rights management information.[169][13] Additionally, the amendments ensured statutory and inalienable royalties for authors and composers, particularly in the music and film industries.

The 2012 amendments also aligned Indian copyright law with international obligations under treaties such as the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty, which emphasize protection of copyright and related rights in the digital environment.[170] Overall, the Copyright Act, 1957, as amended, reflects the evolving nature of intellectual property law in India in response to technological advancements and global standards.

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[165] Copyright Act, 1957, Section 22.
[166] Copyright Act, 1957, Sections 23–29.
[167] Copyright Act, 1957, Section 52(1)(a), (b), (i).
[168] Civic Chandran v. Ammini Amma, 1996 (16) PTC 329 (Ker), at 335–336.
[169] Copyright Act, 1957, sections 65A–65B.
[170] World Intellectual Property Organization, WIPO Copyright Treaty, arts. 6–8 and World Intellectual Property Organization, WIPO Performances and Phonograms Treaty, arts. 10–15.

EU LAWS

Copyright protection within the European Union is governed by a harmonized legal framework established through EU directives and regulations. EU copyright law protects creators' rights over their original works, ensuring that they enjoy exclusive rights to reproduce, distribute, and publicly communicate their creations.[171] Protection is automatic upon the creation of an original work, and no formal registration is required.[172]

Copyright protection in the European Union generally lasts for the lifetime of the author plus seventy years after their death.[173] In cases of joint authorship, protection extends to seventy years after the death of the last surviving author.[174] This harmonized duration ensures uniformity across Member States and strengthens legal certainty within the internal market.

Authors are granted several exclusive economic rights under EU law. These include the right of reproduction, which allows authors to authorize or prohibit direct or indirect copying of their works. The distribution right grants authors control over the sale or other transfer of ownership of copies within the European Union. Additionally, the right of communication to the public enables authors to make their works available to the public, particularly through digital and online platforms.

The harmonization of copyright law across Member States has been achieved primarily through legislative instruments adopted by the European Union. The Directive 2001/29/EC (Information Society Directive) laid the foundational framework for copyright protection in the digital environment, including the recognition of certain exceptions and limitations such as private copying. More recently, the Directive (EU) 2019/790 (Digital Single Market Directive) addressed challenges posed by digital platforms and online content-sharing services, requiring them to implement measures to prevent unauthorized dissemination of copyrighted works.[175]

In addition to substantive rights, the European Union has strengthened enforcement mechanisms through measures aimed at combating infringement and ensuring effective remedies for rights holders. At the same time, EU copyright law seeks to maintain a balance between the interests of creators and public access to knowledge, incorporating exceptions for education, research, quotation, and other socially beneficial purposes.

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[171] Consolidated Version of the Treaty on the Functioning of the European Union (TFEU), art. 114 (basis for harmonization measures).
[172] Directive 2001/29/EC, recital 9.
[173] Directive 2006/116/EC, art. 1(1).
[174] Ibid., art. 1(2).
[175] Directive (EU) 2019/790, art. 17.

Recent debates within the European Union concern the interaction between copyright law and emerging technologies, particularly artificial intelligence. The use of copyrighted material for AI training, questions of licensing, and the status of AI-generated content have generated significant legal and policy discussions.[176] These developments illustrate the continuing evolution of EU copyright law in response to technological transformation.

Overall, EU copyright law provides a comprehensive and harmonized framework that protects creators while adapting to the realities of the digital single market

USA

Copyright law in the United States is primarily governed by the Copyright Act of 1976, which grants authors exclusive rights over their original works for a limited period. The Act forms the backbone of modern U.S. copyright law and is codified under Title 17 of the United States Code. It provides a comprehensive statutory framework for the protection of original works of authorship, including literary, musical, dramatic, artistic, and audiovisual works.

Under U.S. copyright law, authors are granted several exclusive rights intended to incentivize creativity and promote the progress of arts and sciences.[177] These rights include the right to reproduce the work, distribute copies, publicly perform and display the work, and prepare derivative works based upon the original.[178] Unauthorized exercise of any of these rights constitutes copyright infringement unless covered by statutory exceptions.

The duration of copyright protection in the United States generally lasts for the lifetime of the author plus seventy years after their death.[179] In the case of works made for hire, anonymous works, or pseudonymous works, copyright subsists for ninety-five years from the year of first publication or one hundred and twenty years from the year of creation, whichever expires first. Works published before 1 January 1930 have entered the public domain and may be freely used without authorization.[180]

Although copyright protection is automatic upon fixation of a work in a tangible medium of expression, registration with the U.S. Copyright Office provides significant legal advantages.[181] Registration is a prerequisite for initiating an infringement suit in federal court

[176] European Commission, Copyright and Artificial Intelligence (Policy discussions and consultation documents, 2020–2023).
[177] U.S. Const. art. I, Sec.8, cl. 8.
[178] 17 U.S.C. Section 106(1)–(6).
[179] 17 U.S.C. Section 302(a).
[180] 17 U.S.C. § 305.
[181] 17 U.S.C. sec. 408.

and enables copyright owners to claim statutory damages and attorney's fees. While registration is not mandatory, it is strongly recommended for effective enforcement of rights.

Upon expiration of the statutory term, copyrighted works enter the public domain, allowing unrestricted use by the public. The public domain plays a vital role in ensuring the free flow of knowledge, cultural expression, and innovation.

A fundamental principle of U.S. copyright law is the idea–expression dichotomy, under which copyright protection extends only to the expression of ideas and not to the ideas, facts, or concepts themselves.[182] This principle ensures that copyright does not impede intellectual freedom or competition. Additionally, the doctrine of fair use permits limited use of copyrighted material without authorization for purposes such as criticism, commentary, news reporting, teaching, scholarship, and research. Courts determine fair use by applying a four-factor test that balances private rights against public interest.

Overall, U.S. copyright law establishes a structured and balanced system that protects creators' rights while ensuring access to creative works through doctrines such as fair use and the public domain.

CURRENT LEGAL LANDSCAPE: COPYRIGHT PROTECTION AND ARTIFICIAL INTELLIGENCE

The rapid advancement of artificial intelligence has generated complex legal questions concerning authorship and copyright protection across jurisdictions. In the United States, the U.S. Copyright Office has consistently maintained that copyright protection extends only to works created by human authors and has denied registration to works produced solely by artificial intelligence without meaningful human involvement.[183] This position reflects the long-standing human authorship requirement embedded in U.S. jurisprudence and reinforced through administrative guidance.[184] Courts have similarly emphasized that copyright subsists only in works reflecting human intellectual conception.[185]

Within the European Union, judicial interpretation by the Court of Justice of the European Union has reinforced the principle that copyright protection requires originality understood as

[182] Baker v. Selden, 101 U.S. 99 (1879).
[183] U.S. Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence (2023).
[184] ibid
[185] U.S. Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence (2023).

the author's own intellectual creation.[186] In *Cofemel Sociedade de Vestuário SA v G-Star Raw CV*, the Court clarified that a work must reflect the exercise of free and creative choices by a human author.[187] This jurisprudence effectively excludes purely AI-generated outputs that lack demonstrable human creative freedom from copyright protection under EU law.

In contrast, Chinese courts have adopted a comparatively flexible approach. Judicial decisions in China have recognized copyright protection for certain AI-assisted works where sufficient human input; particularly through creative prompts, selection, or arrangement; demonstrates intellectual contribution.[188] Although Chinese law does not explicitly grant authorship to artificial intelligence systems, courts have shown willingness to assess the degree of human involvement in determining protectability.

At the global level, a discernible trend has emerged: the majority of jurisdictions currently exclude purely AI-generated works from copyright protection unless meaningful human creative input can be established. The central debate across legal systems revolves around the threshold of human creativity necessary to justify protection and whether traditional authorship doctrines can adequately accommodate generative technologies. As artificial intelligence continues to evolve, legislative and judicial bodies worldwide are increasingly confronted with the challenge of balancing innovation incentives with foundational principles of copyright law.

COMPARATIVE ANALYSIS

Jurisdiction	***Stance on AI Authorship***	***Key Legal Test***
U.S.	***Strictly human-only***	***Human creative input required***
EU	***Human creative freedom***	***Author's free and creative choices***
China	***Flexible, human-in-the-loop***	***Prompt originality and iterative control***

THEORETICAL PERSPECTIVES: AI AS TOOL VERSUS AI AS AUTHOR

[186] Infopaq International A/S v Danske Dagblades Forening, Case C-5/08, EU:C:2009:465.
[187] Cofemel Sociedade de Vestuário SA v G-Star Raw CV, Case C-683/17, EU:C:2019:721, pg. 29–31.
[188] Shenzhen Tencent Computer Systems Co. Ltd. v. Shanghai Yingxun Technology Co. Ltd., Shenzhen Nanshan District People's Court (2019).

The debate surrounding artificial intelligence and copyright law is not merely doctrinal but deeply theoretical, centering on whether AI should be conceptualized as a tool employed by human creators or as a potential author in its own right.

AI AS TOOL (INSTRUMENTAL THEORY)

Under the dominant view in contemporary copyright jurisprudence, artificial intelligence is regarded as an advanced technological instrument, analogous to a camera, software program, or digital editing tool.[189]According to this perspective, authorship remains vested in the human user who exercises creative control over the process, whether through prompt design, selection, arrangement, or post-generation modification. Courts and administrative authorities in major jurisdictions maintain that copyright subsists only where human intellectual conception is present.[190] This tool-based approach preserves the traditional human authorship requirement and avoids expanding copyright protection beyond its doctrinal foundations.

AI AS AUTHOR (AUTONOMOUS CREATIVITY THEORY)

A minority but growing body of scholarship challenges the purely instrumental characterization of AI, arguing that highly autonomous systems operate in ways comparable to human cultural production.[191] Proponents of this view contend that advanced generative models can exhibit independent pattern recognition, stylistic development, and adaptive learning, thereby raising questions about whether the exclusive attribution of authorship to humans remains conceptually adequate. While no major jurisdiction currently recognizes AI as a legal author, the theoretical argument suggests that future legal reform may require reconsideration of the relationship between creativity, intentionality, and legal personality.[192]

The tension between these perspectives reflects a broader philosophical question within copyright theory: whether protection is justified primarily as a reward for human labor and personality, or as an incentive for the production of socially valuable works regardless of their source. As artificial intelligence systems become increasingly autonomous, this theoretical divide is likely to shape legislative and judicial responses worldwide.

CHALLENGES

[189] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).
[190] U.S. Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence (2023); Cofemel Sociedade de Vestuário SA v G-Star Raw CV, Case C-683/17, EU:C:2019:721.
[191] World Intellectual Property Organization, *Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence* (2020–2023 discussions).
[192] European Parliament Research Service, Intellectual Property Rights and Artificial Intelligence (Policy Department Report).

The integration of artificial intelligence into creative processes has introduced a range of conceptual and practical challenges for copyright law, particularly in relation to authorship, ownership, and the meaning of creativity itself.

CHALLENGES IN DEFINING HUMAN CONTRIBUTION

One of the foremost difficulties lies in determining the threshold of human contribution necessary for copyright protection. A persistent question concerns where the line should be drawn between human guidance and machine execution. The increasing sophistication of prompt engineering raises doubts as to how much user input qualifies as authorship, especially when prompts merely initiate, rather than shape, the final output. Similarly, uncertainty persists as to whether activities such as algorithm training, dataset selection, and data curation constitute creative acts or remain purely technical processes. This challenge is further compounded by the lack of transparency in AI decision-making, as the opaque and autonomous functioning of many AI systems makes it difficult to attribute creative choices to identifiable human actors.[193]

IMPLICATIONS FOR CREATORS AND INDUSTRY

These definitional ambiguities have significant implications across stakeholder groups. For artists and creators, AI offers new modes of collaboration and creative experimentation but also poses the risk of diluting the value of human artistry if machine-generated outputs receive comparable legal protection. For technology developers, the absence of clear ownership rules creates uncertainty regarding the commercial exploitation of AI-generated content. Policymakers, meanwhile, face the complex task of balancing incentives for technological innovation with the need to protect human creators' rights. At a broader societal level, these developments prompt a re-evaluation of the concept of "creativity" itself, challenging traditional assumptions that link creative expression exclusively to human intellect.

Collectively, these challenges highlight the inadequacy of existing copyright frameworks in addressing AI-driven creativity and underscore the need for nuanced, forward-looking regulatory responses.[194]

SUGGESTIONS

[193] World Intellectual Property Organization, Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence (2020–2023).
[194] European Parliament Research Service, Artificial Intelligence and Intellectual Property: Challenges and Opportunities (Policy Report).

In response to the doctrinal uncertainty surrounding AI-generated works, several reform-oriented proposals have emerged in academic and policy discourse. These proposals aim to preserve the human-centric foundations of copyright law while accommodating technological innovation.

SUI GENERIS PROTECTION

One widely discussed approach is the creation of a sui generis intellectual property regime specifically tailored to AI-generated works. Such a framework would operate independently of traditional copyright and would protect AI outputs without requiring strict human authorship. The rationale behind this proposal is to prevent doctrinal distortion of existing copyright principles while still incentivizing investment in AI-driven creativity. The scope and duration of protection under this model could be narrower than conventional copyright, thereby ensuring that monopolistic rights are not excessively expanded.

GRADED ORIGINALITY TEST

Another proposal advocates the adoption of a tiered or graded originality standard, under which the extent of legal protection would correspond to the degree of human creative involvement. Where human input is substantial; such as through detailed prompts, selection, arrangement, or modification; full copyright protection may be justified. Conversely, where AI operates autonomously with minimal human contribution, only limited or neighbouring-right–style protection may be granted. This approach seeks to preserve the principle of human intellectual creation while introducing flexibility into the assessment of originality.

REGISTRATION AND DISCLOSURE REQUIREMENTS

A further reform suggestion involves enhancing transparency through mandatory disclosure of AI involvement during the copyright registration process.[195] Applicants could be required to specify whether AI tools were used and to what extent the output reflects human intellectual contribution. Such procedural safeguards would assist courts and administrative bodies in assessing authorship claims and reduce the risk of over-claiming rights in purely machine-generated content. This approach has already gained attention in administrative practice, particularly in the United States.

INTERNATIONAL HARMONIZATION

[195] U.S. Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence (2023).

Given the transnational character of artificial intelligence technologies and digital dissemination, fragmented national approaches risk creating regulatory inconsistencies. There is therefore increasing emphasis on developing harmonized international standards through multilateral forums such as the World Intellectual Property Organization. Global coordination would promote legal certainty, reduce forum shopping, and ensure that creators, developers, and users operate within a coherent regulatory framework across jurisdictions.

Collectively, these reform proposals illustrate the evolving nature of copyright discourse in the AI era. While traditional copyright law remains anchored in human creativity, adaptive regulatory models are increasingly viewed as necessary to balance innovation, fairness, and global consistency

CONCLUSION

The core question; whether artificial intelligence is capable of creation; admits no singular resolution. Although contemporary AI systems exhibit impressive proficiency in generating outputs that emulate or even exceed human creative endeavors in technical complexity, the notion of "creation" enshrined in copyright jurisprudence remains fundamentally tethered to human intellectual agency. The predominant judicial consensus in principal jurisdictions, especially the United States and the European Union, upholds human authorship as an essential prerequisite for copyright protection. This stance, exemplified in decisions such as *Thaler v. Perlmutter* and *Cofemel*, embodies a profound commitment to copyright's constitutional and statutory aims: to promote human innovation rather than remunerate independent machine functions. Accordingly, works produced solely by AI, absent significant human creative contribution, are relegated to the public domain. Nevertheless, this anthropocentric orthodoxy confronts mounting pressure from technological advancements and jurisprudential divergences. The rise of advanced human-AI collaborative processes; involving iterative prompt refinement, selective curation, and substantive user modifications; undermines the rigid binary between human authorship and machine generation. The Beijing Internet Court's affirmation of copyright protectability for Stable Diffusion-generated images, predicated on the originality embedded in prompt engineering and parameter adjustments, exemplifies a marked departure from Western doctrinal stringency. Such disparities reveal the absence of global consensus and accentuate the imperative for unified, prospective regulatory frameworks.

The philosophical debate concerning whether AI entities could qualify as authors endowed with rights persists as a theoretically divisive issue, albeit one that is practically unripe for

resolution. Extending personhood or moral status to artificial systems encounters formidable epistemological barriers, notably the "hard problem" of consciousness and the lack of common biological substrate that enables inference of subjective experience. Although legal personhood constitutes a malleable construct extensible to non-human entities, as evidenced in corporate law precedents, ascribing inherent moral rights to AI necessitates resolving inquiries into sentience and intentionality that defy empirical substantiation at present. This epistemic uncertainty militates against precipitous acknowledgment of AI as independent authors, while preserving openness to prospective reassessment contingent upon technological advancements. The doctrinal hurdles delineated; establishing thresholds for human contribution, evaluating originality in human-AI collaborations, adjudicating the permissibility of training data utilization, and delineating derivative from original expression; collectively underscore the insufficiency of prevailing copyright regimes in accommodating AI-facilitated creativity. Conceiving AI instrumentally as an advanced implement, though jurisprudentially expedient, obfuscates the paradigmatic transformation wrought by generative systems that manifest interpretive autonomy and aesthetic discernment exceeding direct human oversight. This attenuation of creative agency, exacerbated by the inscrutability of algorithmic operations, impedes conventional authorship scrutiny and imperatives refined assessment paradigms.

Amid this paradigm shift, the present study endorses malleable regulatory adaptations that safeguard copyright's anthropocentric tenets while facilitating technological progress. A sui generis protection mechanism emerges as a viable conduit, instituting a bespoke intellectual property rubric for AI-generated outputs decoupled from orthodox copyright precepts. This architecture would avert doctrinal contortion, furnish stimuli for AI development, and mitigate the limbo of legal indeterminacy for machine outputs. Ancillary provisions, such as tiered originality evaluations attuned to human creative input levels and obligatory disclosure mandates in registration processes, would bolster transparency and aid tribunals in authorship adjudication. Paramountly, harmonization via international bodies like the World Intellectual Property Organization is indispensable to forestall regulatory balkanization and secure cohesive transnational oversight. In essence, the inquiry "Can artificial intelligence create?" yields to the more pivotal question "How ought the law to address AI-generated outputs?" Copyright jurisprudence, as a conduit for cultural and scientific advancement, must arbitrate contending priorities: stimulating human ingenuity, nurturing technological innovation, guaranteeing public domain access to knowledge, and upholding doctrinal integrity. This equipoise eludes absolutist repudiation or unqualified embrace of AI outputs, necessitating

granular, context-attuned scrutiny that accommodates the continuum of human-machine symbiosis. The trajectory of copyright amid AI proliferation resides not in rigid doctrinal fortifications but in supple architectures adaptable to technological flux, consonant with the cardinal mandate of fostering scientific and artistic progress. As AI propels inexorably forward, jurisprudence must ascend to harmonize innovation with foundational principles, securing apt niches within the intellectual property matrix for tomorrow's creations; be they human, machinic, or chimeric.



FROM INDIGENOUS HERITAGE TO INTELLECTUAL PROPERTY: A COMPARATIVE STUDY OF TRADITIONAL KNOWLEDGE PROTECTION IN INDIA AND GLOBALLY

Dr. Pooja Jain*

ABSTRACT

Traditional Knowledge (TK), embedded in the cultural heritage, practices, and innovations of indigenous and local communities, has increasingly attracted global attention due to its economic, medicinal, agricultural, and environmental value. However, the conventional intellectual property rights (IPR) framework, originally designed to protect individual and commercially driven innovations, often fails to adequately safeguard the collective, intergenerational, and dynamic nature of traditional knowledge. This research article undertakes a comparative legal study of the protection of traditional knowledge in India and at the global level, critically examining the evolution from community-based heritage systems to formal intellectual property-oriented mechanisms. The paper analyses India's sui generis and legislative responses, including the Biological Diversity Act, 2002, the Protection of Plant Varieties and Farmers' Rights Act, 2001, the Traditional Knowledge Digital Library (TKDL), and judicial interventions addressing bio-piracy and misappropriation. These are evaluated alongside international and regional frameworks such as the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access and Benefit Sharing, the World Intellectual Property Organization's Intergovernmental Committee (WIPO-IGC) negotiations, UNESCO conventions, and selected national models from jurisdictions such as Peru, South Africa, and Australia. Through doctrinal and comparative analysis, the article explores key challenges in traditional knowledge governance, including definitional ambiguities, community consent, equitable benefit-sharing, cross-border enforcement, & tension between customary laws and formal intellectual property regimes. It argues that while global efforts increasingly recognize the need to protect traditional knowledge, existing mechanisms remain fragmented and

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inadequately aligned with indigenous worldviews and collective ownership structures.

KEYWORDS: Traditional Knowledge, Indigenous Communities, Bio-piracy, Comparative Law, Nagoya Protocol, Access and Benefit Sharing, Sui Generis Protection.

INTRODUCTION

The traditional body of knowledge consists of the skills, innovations, practices, and cultural expressions that the indigenous and local communities create, maintain and transmit over the years. It encompasses different spheres of life like medicine, agriculture, biodiversity, conservation, and spiritual practices. Most of the time, it is not scripted and is owned collectively, evolving through collective use and adaptation. It also differs from modern scientific knowledge which is almost always formally documented (Sengupta, 2018). Recently, traditional knowledge systems have gained significance as a result of the growing adoption of biotech, pharmaceuticals, agriculture, and cosmetics. While the exploitation of these fields has led to the emergence of new sources of income, it has also revealed the inadequacy of the existing structures of intellectual property systems. The traditional forms of intellectual property systems standards like patents, copyrights and trademarks are based on limited authorship, novelty, fixed time, and territoriality. These principles are in fundamental contradiction to the nature of traditional knowledge which is collective, inter-generational, and trans-boundary.

The increasing frequency of bio-piracy has pinpointed this specific misalignment. When foreign entities patented turmeric with wound healing properties, neem-based products, and various basmati rice strains, there was international concern about the ability of traditional knowledge to be appropriated. The courts and administrative bodies involved in these disputes revealed the drawbacks of defensive patenting & need for more positive protection strategies (Khurana and Sharma, 2025). India has increasingly become an experimentation site for the protection of traditional knowledge, in part, due to India's status as one of the world's most biodiverse countries, combined with the diversity of its indigenous peoples. India has established an intricate and multi-layered system that integrates traditional biodiversity law with components of farmers' rights, positive documentation, and benefit-sharing. India's continuous domestic development has paralleled shifting global dialogues concerning the Convention on Biological Diversity, the Nagoya Protocol, & various iterations of WIPO's

Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge, and Folklore (WIPO, 1993).

This article analyzes India's proposals in the context of the global attention being paid to the protection of traditional knowledge. Specifically, the article analyzes whether the movement from heritage systems to frameworks that are anchored in intellectual property systems has genuinely benefited traditional knowledge systems holders, or whether it has, chiefly, reconstituted collective knowledge into legally actionable forms for the marketplace. Through a comparative approach, the author analyzes contemporary systems of protection and reviews the effectiveness, challenges, and primary assumptions of the systems and proposes options for greater culturally attuned and just systems of protection.

THE TRADITIONAL KNOWLEDGE: AN OVERVIEW

Traditional knowledge remains a source of legal imprecision. International legal documents, domestic legislation, and legal positivist doctrines employ different names, such as, for example, "indigenous knowledge", "local knowledge", or "traditional cultural expressions". Despite this diachronic and diverse use of terminology, there are some attributes that are constant. The knowledge possessed is, in the majority of the instances, collective, spontaneously generated and has no individual author. It is acquired through experience and is not recorded in writing, and it is usually associated with a specific geographical area or bioregion and is governed by a legal regime of customs and not the formal law (Jose and Manchikanti, 2022).

To Indigenous Peoples, traditional knowledge/ sacred knowledge are not simply practical knowledge streams. For them, all knowledge streams are intertwined with cultural identity & spirituality of the people. The pathways of knowledge of medicinal plants, agricultural cycles, & management of the ecosystem, are closely tied with the rituals, social structures, beliefs and customs of the people. The holistic systems of knowledge of the Indigenous Peoples are worlds apart from modern intellectual property laws that are compartmentalized and tend to separate or dissociate innovation and its cultural and ecological values.

Traditional knowledge also adds to complexity of its legal treatment because of its unique and different temporality. Unlike patents that are time bound and require novelty, traditional knowledge evolves. It means that traditional knowledge evolves in its own time. It transforms and adds value in the process because of its durability. It is almost the opposite of what the

modern intellectual property laws are designed to promote. For that very reason, traditional knowledge often falls to the public domain of modern intellectual property laws. It remains unprotected, even though its values, beliefs, and customs are highly integral to the culture of the people (Chouhan, 2012).

These conceptual tensions best describe the political, social, and legal efforts of national and international bodies in trying to address the gaps of the Indigenous Peoples' traditional knowledge and modern intellectual property laws. The focus of the subsequent parts of the paper is on the efforts of India & international community in this regard.

THE PROTECTIVE FRAMEWORK OF TRADITIONAL KNOWLEDGE IN INDIA

Several experts in India's traditional knowledge protection acknowledge the efforts of the Indian authorities and scholars in the area of traditional knowledge protection. India's efforts go beyond the use of conventional intellectual property protection. India seeks to use a comprehensive approach by intertwining the preservation of biodiversity, the protection of the rights of the practitioners of traditional knowledge, & documentation and benefit sharing components. This shows an understanding that traditional knowledge is a social and cumulative product that must be protected beyond the use of a monopoly rights framework (Ragavan, 2002).

The Biological Diversity Act, 2002 is the primary source of India's traditional knowledge legislation. It provides a framework in response to India's obligations under the Convention on Biological Diversity which aims to govern the use of traditional knowledge associated with biological resources & equitable sharing of benefits to the local people.

The Act creates a three-tier institutional framework consisting of the National Biodiversity Authority (NBA), the State Biodiversity Boards, & local Biodiversity Management Committees (BMCs). Of special importance, section 6 of the Act requires applicants seeking any intellectual property rights relating to research or information pertaining to Indian biological resources and associated knowledge to obtain prior approval of the NBA. This provision mitigates the risk of bio-piracy and brings the protection of intellectual property rights within the framework of access and benefit-sharing.

The community-centric focus of the Act is strengthened by its interpretation in the courts. In *Divya Pharmacy v. Union of India* (Uttarakhand High Court, 2018), the court supported the position of the NBA to impose benefit-sharing conditions on commercial users of biological

resources and recognized the right of economic benefit access to the holders of the concerned traditional knowledge *(Divya Pharmacy v. Union of India*, 2018 SCC OnLine Utt 1742). The court ruling, in writing, emphasized that benefit-sharing is no longer a matter of grace and good will, but a matter of right, arising from treaty obligations of the Republic of India.

While the BDA might be seen as trying to be progressive, it has been criticized for having high bureaucracy, and for having minimal participation from the bottom. Many of the Biodiversity Management Committees are understaffed and or under-skilled, & sharing of benefits is usually settled without proper consultation with the community. Still, it is an Act that provides movement away from an IP-centric model to a more rights-based and equitable conservation orientation.

The Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPVFR Act) represents an effort from India to safeguard farmers' traditional knowledge while attempting to comply with the TRIPs Agreement. This Act is different from typical plant breeders' rights regimes because it acknowledges farmers as cultivators, conservers, and breeders of plant varieties (Gopalakrishnan, 2005).

Farmers, according to Section 39 of the Act, have the right to save, use, exchange, and sell the product of their farms, which also includes the seeds of protected varieties, with some limitations. The Act is significant because it recognizes the value of the traditional farming communities who have contributed to the conservation and development of plant genetic resources. The creation of the National Gene Fund is intended to implement benefit sharing and reward systems for communities that have maintained landraces and traditional varieties.

In *Monsanto Technology LLC v. Nuziveedu Seeds Ltd.* (FAO (OS) (COMM) 86/2017), the Supreme Court of India dealt, albeit indirectly, with the possible conflict between the patent system & plant variety protection system in India. Although the case centered around the issue of patentability of genetically modified seeds, the Court, once again, reaffirmed the legislative purpose of the PPVFR Act aimed at curbing the monopolization of plant genetic resources, and protecting the interests of the farmers. The ruling highlighted the attempt of India's legal system to prevent the erosion of the agricultural tradition and knowledge through over monopolistic claims on it.

One of the most original and innovative ideas to safeguard India's interests against bio-piracy, is the management and creation of the Traditional Knowledge Digital Library. TKDL is the

result of a partnership between the Council of Scientific and Industrial Research (CSIR) & Ministry of AYUSH. The TKDL catalogues traditional knowledge, which is medicinally oriented, and is derived from classical literature of Ayurveda, Unani, Siddha, and Yoga (Kaur, 2021).

By creating a different, and more user-friendly, representation of traditional knowledge, the TKDL assists patent offices around the world in identifying and rejecting baseless patent claims. The success of the TKDL has been demonstrated through is ability to help revoke and withdraw a number of patent applications including turmeric, and other formulations, neem and ashwagandha.

TKDL is a prime example of a great initiative but does have some flaws. Documenting details at scale prevents knowledge from evolving and could result in the misuse of community sensitive information. Also, the TKDL serves a more defensive purpose. It doesn't offer a positive proprietary right and does not guarantee the traditional knowledge holders receive any benefit from sharing that knowledge.

The Indian Judiciary System has been notable in defining the borders surrounding traditional knowledge and bio-piracy. A prime example is the turmeric patent controversy that is often referenced. A patent from the United States Patent and Trademark Office was issued for the properties of turmeric that heal wounds, but the USPTO patent was revoked following a challenge backed with Documented Traditional Knowledge (*Council of Scientific and Industrial Research v USPTO, Patent Reexamination Case,* 1997).

In the same way, there was a successful challenge of a patent obtained for neem pesticides in Europe arguing that the inventions in the patent lacked novelty & practices are traditional agriculture of India (Neem Case, European Patent Office, Opposition Proceedings, 2000). These types of cases have shown the traditional knowledge's lack of protection in the existing frameworks of intellectual property and traditional knowledge systems at the international and national levels (Ganeshan, 2016).

Indian courts have begun to acknowledge the constitutional implications of traditional knowledge. In the case of *Samatha v. State of Andhra Pradesh* (AIR 1997 SUPREME COURT 3297), although it is not an intellectual property case, the Supreme Court examined the relationship the native people of this country have with the land & resources. He described the need to defend the autonomy of the tribes and their traditional rights. Such case law serves as

a basis of legal doctrine for the integration of traditional knowledge protection with the constitutional values of the poor, the cultural rights & social justice.

What the Indian legal system on the protection of traditional knowledge shows is a practical acknowledgment of the shortcomings of conventional IP Law. With the fusion of biodiversity law, farmers' rights, and judicial activism, the protection of traditional knowledge is law is contextually relevant to indigenous people (Nagbhidkar, 2025).

However, challenges remain. Implementation is always inconsistent, the distribution of benefits is unequal, & participation of communities is more of a show than anything real. Furthermore, illegitimate appropriation of traditional knowledge is often done through cross-border commercial transactions and international collaborative research, while the Indian model strictly adheres to the nation state.

GLOBAL FRAMEWORKS FOR THE PROTECTION OF TRADITIONAL KNOWLEDGE

International law has begun addressing the fragmentation of traditional knowledge protection systems; especially concerning intellectual property law, protection of biodiversity, & rights of indigenous peoples. Legal systems around the world continue to remain fragmented and India's domestic legal regime is pieced together. A lot of work has gone into incorporating systems that acknowledge traditional knowledge. However, the lack of a universal and consistent legal approach continues to inhibit meaningful protection of traditional knowledge.

The Convention on Biological Diversity initiated a completely new consideration of the protection of traditional knowledge on the world stage, since its adoption in the year 1992. The 8(j) of the CBD of the knowledge, innovations, and practices of the indigenous and local communities is aimed at the conservation of biodiversity. The CBD also aims at equitable and fair benefit sharing concerning the access and use of such knowledge (Cropper, 1993).

Even though Art. 8(j) has remained an important addition to legal instruments, its implementation has been patchy. The CBD does not create direct, legally enforceable rights for Indigenous peoples, nor does it provide mechanisms to address and respond to the problem of appropriation and misappropriation and relies on domestic implementation, which creates a very uneven legal patchwork. Nevertheless, it has served as the basis for the development of access and benefit-sharing systems and national laws on biodiversity.

The principles of the CBD that have been recognized in international law, combined with the CBD and its international legal principles relating to the environment and human rights, provide a solid basis for legal arguments. In *Awas Tingni v. Nicaragua* (Inter-American Court of Human Rights, 2001), the court recognized the Indigenous peoples' collective rights to their traditional lands and resources and made the important connection between the right to culturally survive & right to control (exploit) traditional knowledge. Though this is not an IP case, this case has been important in the development of the thinking of traditional knowledge as a collective right of human beings

The Nagoya Protocol was created in 2010 alongside the Convention on Biodiversity. This Protocol offers the first substantive hints on how to achieve the operationalization of benefit-sharing. It covers the legal access of genetic resources & associated traditional knowledge of the concerned party(s) via prior informed consent (PIC) and mutually agreed terms (MAT) (Trujillo, 2025).

One of the unique aspects of the Protocol compared to previous drafts of Access and Benefit Sharing (ABS) is the integration of the local and Indigenous communities as traditional knowledge holders. This means local and Indigenous communities are fair and equitably compensated for the knowledge they possess. This is a marked shift compared to previous drafts, which primarily focused on the conservation of the resources.

The Nagoya Protocol's main problem is the lack of full and voluntary participation of the countries of the world. This means the Protocol's reach and effectiveness is very limited. Since the majority of the world is not part of the Protocol, these bioprospecting benefit-sharing disputes are often left unsolved rather than analyzed in a court of law, leaving many unresolved legal questions.

The World Intellectual Property Organization's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge, and Folklore (WIPO-IGC) provides the most relevant international forum for the discussions on the protection of IP pertaining to Traditional Knowledge. While the IGC was established in 2000, they have been engaged in long-term discussions to develop several international legal instruments that would aim to protect the rights of the creator or originator, establish equitable benefit sharing, and prevent the misappropriation of the work (Bhukta, 2020).

The work of the IGC presents the high level of conceptual disagreements between States. On the one hand, developed countries generally support non-binding guidelines and defensive protection such as databases and disclosure. On the other hand, developing regions support legislation that provides legal protection and enforcement and provides for affirmative rights and protection of Traditional Knowledge. The Indigenous voice has usually been clear that these IP focused options are inadequate and that they incorporate an overarching need to respect and support the customary law of the people, along with self-determination.

The IGC is an example of the complexity and breadth of legal frameworks and competing interests on a global stage. The IGC has been in discussions for over 20 years and still has not produced a legally binding treaty. Most countries are still reluctant to introduce and escalate regulations for IP international treaties. Draft texts of the IGC have had a global impact, especially on the domestic and regional legislation of other nations, such as the requirements and documentation strategies in India.

Traditionally, UNESCO has viewed the heritage of the peoples of the world, including traditional knowledge, as something more than economically exploitable resources. Cultural heritage is recognized by UNESCO, while the Convention for the Safeguarding of the Intangible Cultural Heritage lists elements of the cultural heritage, which include oral history, music and dance, social rituals, and arts and crafts, as they relate to the identity of a people (Jain, 2023).

Although customarily UNESCO has focused on the economically non-exploitive uses of the heritage of the world's peoples, they do not focus on the lack of equitable sharing of non-exploitive uses, uses of the heritage that can be described as "misappropriation". Thus, UNESCO has limited capacity to protect traditional knowledge from the phenomenon of "bio-piracy". Even so, the cultural heritage perspective helps to work within the global frameworks and national legal systems on the protection of biodiversity and traditional knowledge that are of non-economic value.

Sometimes, on the protection of cultural heritage of the peoples of the world, courts have offered some guidance on the protection litigation involving indigenous peoples. In the Mabo case, the High Court of Australia, for the first time, recognized the doctrine of terra nullius was not applicable, and instead, recognized indigenous people's legal rights & value of their customs and traditions *(Mabo v. Queensland (No. 2)*, (1992) 175 CLR 1). This case has played

a significant role in the legal discourse on traditional knowledge & customary laws that have evolved since.

The Law No. 27811 constitutes an example of one of the most inexorable sui generis regimes for the protection of traditional knowledge in Peru. It sets a system for the protection of the collective knowledge of the indigenous peoples of Peru. The Law embraces the indigenous community as collective right holders with respect to the traditional knowledge, & Law mandates benefit sharing for the commercial utilization of the traditional knowledge.

The Peruvian model is pivotal due to its approach towards community consent and community contractual arrangements. However, the limited community contractual arrangements are a result of Peru's limited enforcement capability & difficulties of ascertaining and identifying the representative authorities of a given community.

The Protection, Promotion, Development and Management of Indigenous Knowledge Act, 2019 of South Africa is an attempt to deal with the merging of the components of intellectual property and cultural heritage, and customary law. It provides for the establishment of a national repository of indigenous knowledge, benefit-sharing agreements, and community ownership (Roy, 2024).

The South African courts, particularly in the area of cultural rights & right to equality, have dealt with the indigenous knowledge issue in the constitutional sphere. The Constitutional Court in *Alexkor Ltd v. Richtersveld Community* (2003 (12) BCLR 1301 (CC)) acknowledged the status of indigenous customary law within the legal order as a source of rights, and this affirmed the community-based knowledge systems.

Australia's legal system is still fragmented and relies on a combination of common law doctrines, statutory protections, and policy initiatives. Courts have recognized the cultural land rights of the Indigenous Australians, yet the traditional knowledge of Indigenous Australians is still not sufficiently protected under the IP laws. This being the case, Indigenous Australians have made calls for more comprehensive legal protections grounded in Indigenous self-determination (Kumar, 2020).

The Indigenous knowledge protections advocates have shown a growing recognition of the value of traditional knowledge. However, the mechanisms of protections still do not sufficiently reflect the worldviews of the Indigenous people. The following sections analyze,

in an attempt to assess and understand the challenges, the comparative models, India, to the global stretch of the models.

CRITICAL CHALLENGES AND COMPARATIVE ASSESSMENT

Although there has been an increase in international acceptance of traditional knowledge, the existing frameworks of protection in India & world continue to struggle with the same structural and conceptual issues. Definitional ambiguity remains a primary concern. When it comes to traditional knowledge, intellectual property law considers novelty, singular authorship, and a limited timeframe and, therefore, traditional knowledge is, unfortunately, treated as part of the public domain and is commercially exploited as such without permission or compensation.

The lack of prior informed consent and benefit sharing is the second of these challenges. Although the Nagoya Protocol and India's Biological Diversity Act do recognize these principles, there is still a large disparity in enforcement. Negotiations are often top-down and communities are left out, benefit-sharing is vague, & provision of financial resources to the community is often never realized. This disconnects between the legal framework, & actual participation of the community undermines the system's legitimacy.

The challenges of cross-border enforcement are also significant. The Other Transnational Challenges That Affect Traditional Knowledge Protection are of a cross-border nature. Traditional knowledge, which is a type of knowledge that is shared and collectively owned, is often disseminated across multiple and inter-related communities and regions that do not correlate with present-day geopolitical boundaries. Likewise, knowledge protection mechanisms remain largely territorial, which is insufficient when multinational corporations are involved in international disputes over intellectual property where traditional knowledge from one country is patented in a different country. This lack of a comprehensive international legal framework on the protection of traditional knowledge further limits the legal options available to the communities that are the original source of the knowledge.

The tensions between the informal/ customary legal systems & formal/state legal systems also remain largely unaddressed. Indigenous communities often govern the circulation of knowledge through informal/customary systems that emphasize stewardship, collective responsibility, and, in some cases, spiritual relations. These systems are in stark contrast to formal legal systems, which are typically state-centered and, in most jurisdictions, focus on

commodification and enforcement. While the recognition of customary law in certain jurisdictions (e.g., India, South Africa) has been on the increase (e.g., *Samatha v. State of Andhra Pradesh*, (1997) 8 SCC 191; *Alexkor Ltd v. Richtersveld Community*, 2003 (12) BCLR 1301 (CC)), the intellectual property regime has not been the main beneficiary of this recognition.

India's model is the most varied and has the most robust defensive protection mechanisms with the Traditional Knowledge Digital Library. However, there are still barriers due to red tape and a lack of community. International systems promote the idea of free trade protection and flexible systems but are fragmented and lack enforceability. The potential of countries like Peru and South Africa is known, but they still face the same barriers of lack of implementation and lack of potential with sui generis legislation.

CONCLUSION

The comparative analysis undertaken in this study demonstrates that while there has been a marked shift from viewing traditional knowledge merely as cultural heritage to recognizing it as a subject of legal and economic value, existing intellectual property frameworks remain fundamentally ill-suited to capture its collective, intergenerational, and culturally embedded nature. Both India & international community have made notable progress through biodiversity laws, access and benefit-sharing mechanisms, and defensive protection strategies such as documentation and disclosure requirements. However, these measures largely operate within state-centric and market-oriented paradigms that continue to privilege formal innovation over lived knowledge systems. As a result, traditional knowledge protection remains fragmented, unevenly enforced, and often disconnected from the customary laws, spiritual values, and governance structures of indigenous and local communities. The persistent gaps in prior informed consent, equitable benefit-sharing, and cross-border enforcement underscore the limitations of relying predominantly on conventional intellectual property doctrines to safeguard indigenous heritage.

Looking forward, this paper argues for a holistic and rights-based reorientation of traditional knowledge protection that transcends narrow intellectual property logics. Such an approach must integrate intellectual property law with biodiversity conservation regimes, international human rights norms, & recognition of indigenous customary law as a legitimate source of rights and obligations. At the international level, there is an urgent need for greater consensus on a legally binding instrument, particularly within forums such as WIPO, that explicitly

acknowledges indigenous peoples and local communities as collective rights holders, rather than mere stakeholders. Binding norms on disclosure of origin, prior informed consent, and benefit-sharing must be accompanied by effective compliance and enforcement mechanisms capable of addressing transnational misappropriation. Equally important is the meaningful participation of indigenous representatives in global norm-setting processes, ensuring that protection models reflect indigenous worldviews rather than retrofitting traditional knowledge into existing commercial frameworks.

In the Indian context, while the country's multi-layered approach, combining biodiversity legislation, farmers' rights, judicial interventions, and defensive documentation, offers valuable lessons for other jurisdictions, its future effectiveness depends on deeper community empowerment and institutional reform. Strengthening local governance bodies, ensuring genuine community consultation, improving transparency in benefit-sharing arrangements, and according to due weight to customary laws are essential to move beyond symbolic protection. More broadly, this study contends that safeguarding traditional knowledge requires a paradigm shift in how law conceptualizes ownership, innovation, and justice. Rather than treating traditional knowledge as a resource to be enclosed or commodified, legal systems must recognize it as a living, relational, and evolving body of knowledge integral to cultural survival and sustainable development. Only through such a pluralistic and culturally responsive framework can traditional knowledge protection become both equitable and effective in an increasingly globalized world.

INTELLECTUAL PROPERTY IN THE AI-DRIVEN ERA: COPYRIGHT CHALLENGES AND INCLUSIVE INNOVATION IN AI-GENERATED WORKS

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ABSTRACT

In a world that is rapidly undergoing technological advancement, intellectual property (IP) becomes a determinant of innovation wherein there is fostering of inclusive growth amidst the challenges arising from digital transformation. The usage of Artificial Intelligence is an evolving tool to the creative sector, as new age innovation challenges the constructs of ownership unlike intellectual property before. While the usage of AI has increased the potential for innovation beyond productivity and accessibility, they also pose profound IP challenges such as the ambiguous nature of the author of AI-created work. AI tools such as DALL-E, Midjourney, and GPT-based invention drive art, music, literature, and software development independently, throwing into question a crucial IP paradigm which is human authorship. The paper deals with the legal challenges that may arise, followed by the consequences of AI interference on IP registration wherein implications for different IP rights come into play as the training of the AI system entails data mining and accessing other protected IP. This paper researches in depth the scope of IP registration of AI generated works by analysing various legal frameworks like Berne Convention, EU's Copyright Law, US's Copyright Act, India's Copyright Act, 1957 and its various amendments. The paper explores the implication of copyright laws in AI generated works and its usage by analysing cases such as Bartz v. Anthropic, 3:24-cv-05417 (N.D. Cal.), Kadrey v. Meta Platforms, Inc., 3:23-cv-03417, (N.D. Cal.), Arijit Singh v. Codible Ventures LLP, 2024 SCC Online Bom 2445, Getty Images and others v. Stability AI [2025] EWHC 38 (Ch). This paper highlights the crucial role that global collaboration and awareness play in the creation of copyright laws that support creativity in the AI era.

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KEYWORDS: Artificial Intelligence, Copyright law, Digital Transformation, Inclusive growth, Intellectual property systems.

INTRODUCTION

In recent years, rapid developments in computer systems and technologies transformed AI from a dream of the future into an integral part of business strategy. More and more companies across different industries are willing to incorporate AI into their operations as part of their business strategy where they are driven by the promise of enhanced efficiency and decision-making. It finds application in a broad spectrum of industries and impacts almost every element in the process of creation. There is no denying that AI systems are going to remain a norm and it is expected that using AI is going to radically alter how businesses function and operate in the future. Yet another aspect of developing and using AI is being clouded with controversy particularly with respect to IP law because there are numerous prominent AI disputes which have been argued before courts as the main question of who is the author lingers.

BRIEF HISTORY OF AI AND IT'S DEVELOPMENT

The phrase 'artificial intelligence' showed up in writing for the first time in the proposal for the Dartmouth Summer Research Project on AI," by John McCarthy, Marvin Minsky, and other researchers. Before the term was even created, Alan Turing a brilliant Mathematician in 1950 created the Turing test where he proposed whether a machine can think. The notion of Artificial intelligence evolved as the 20th century progressed into 21st century. For instance, [196]in 2007, the ImageNet project which aimed at building one of the world's most comprehensive databases of labelled images was started as an initiative of Fei-Fei Li and her group at Princeton University. [197]In 2020, the OpenAI company develops the GPT-3 language model with 175 billion parameters which makes it one of the world's most advanced language processing tools to date. Its capabilities range from being able to produce human-like language to carrying out conversational dialogue, writing computer programs, translated foreign languages, and even writing creative pieces.

[198]From 2021 to 2023, OpenAI develops DALL-E, later DALL-E 2 and DALL-E 3 in which a set of generative AI models are created to give out detailed images using a text description. These AI-based computer vision tools use deep learning and a transformer model to produce intricate and artistic images

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[196] Deng, J., Dong, W., Socher, R., Li, L.-J., Li, K., & Fei-Fei, L. (2009). *ImageNet: A large-scale hierarchical image database*. In *Proceedings of the 2009 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* (pp. 248–255). IEEE. https://doi.org/10.1109/CVPR.2009.5206848

[197] Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., Neelakantan, A., Shyam, P., Sastry, G., Askell, A., Agarwal, S., Herbert-Voss, A., Krueger, G., Henighan, T., Child, R., Ramesh, A., Ziegler, D. M., Wu, J., Winter, C., … Amodei, D. (2020). *Language models are few-shot learners*. *Advances in Neural Information Processing Systems*, *33*, 1877–1901. https://papers.nips.cc/paper/2020/hash/1457c0d6bfcb4967418bfb8ac142f64a-Abstract.html

[198] OpenAI. (2023). *DALL·E 3*. Retrieved from https://openai.com/index/dall-e-3/

based on a description given by a user. Another AI was [199]launched in 2022, "Midjourney" is a well-known image creation AI bot that graphic designers or anyone interested in learning about AI-created artworks can utilize. AI has evolved itself to effectively output creations based on user's input. Through its data mining and learning source, it can cover through various topics and be used by anyone. Even search engines like Google have started to use AI for their interface.

THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON THE TRADITIONAL NOTIONS OF INTELLECTUAL PROPERTY REGISTRATIONS

Even though there are many advancements that Artificial Intelligence offers, there is also an increased challenge to the laws that govern Intellectual Property. The challenge that has been posed to intellectual property rights and that has been questioned are particularly the use of Patents. For instance, who really owns the Patent? since it is human beings that possess patent rights.

The DABUS case which is [200]Stephen L Thaler v. Comptroller General of Patents, Design and Trademark brought dispute relating to legal framework pertaining to inventions created with the use of Artificial Intelligence. They challenged whether AI is capable of being the owner of intellectual property or if there needs to be any changes in patenting laws. Here a dilemma occurs on who is considered to be the author. Dispute of authorship occurs between the AI developer, the user who controlled the AI and the original author whose works the AI might have used for training the AI to create the AI generated creative work.

In this case, the supreme court stated that even if Thaler is the inventor and user of DABUS, he can't get patents for his inventions made by AI. This was due to the fact AI is not a person and a person is needed to claim patents.

THE LEGAL IMPLICATIONS OF AI-GENERATED WORKS WITHIN THE EXISTING INTELLECTUAL PROPERTY REGIMES

The models are trained using massive amounts of data obtained from websites and databases. In most situations, a new and transformative work is created in light of patterns found in the data and not by copying the original work verbatim. The scope of the 'originality' in the Copyright Act, 1957 was considered by the Supreme Court of India in the case of [201]Eastern Book Company & Ors. vs. D.B. Modak, wherein the Court held that for the purpose of copyrighting a certain piece of work there should be a certain level of originality and intellectual effort that is required to be shown. Presently any argument that a person who is relying upon a computer for editing a couple of aspects in an already existing piece of work does not in any manner qualify a person as an 'author' under the Act and thus

[199] Midjourney. (2025). *Legacy features*. In *Midjourney documentation*. Retrieved from https://docs.midjourney.com/hc/en-us/articles/33329788681101-Legacy-Features

[200] *Stephen L. Thaler v. Comptroller General of Patents, Designs and Trademarks* [2024] UKSC 20 (UKSC/2021/0201)

[201] *Eastern Book Company & Ors v. D.B. Modak & Anr. (2008*). AIR 2008 Supreme Court 809.

does not qualify them for a copyright. For example, using AI for creative purposes are done in two common scenarios:

i. Works created by AI with human guidance: In this case, the creative inputs provided by humans are unique and constructed well this can lead to copyright ownership as there is clear contributions by human.

ii. Works created by AI without human guidance: When AI generates works independently without any proper human creativity or input, it raises many questions of authorship and it leads to more complex problems. The attribution of authorship to AI itself raises a number of legal and conceptual issues.

Determining liability for AI-generated works is complex as it has to take into consideration the various roles which are the developers of AI, users of AI, and the AI itself have to play. Creators and users of AI-generated content are responsible in ensuring copyright laws compliance. If an AI system creates work on its own without human intervention, it becomes truly tricky to identify the rightful owner of the copyright. In situations where AI use leads to infringement, there are problems to sue whom as there is lack of legal personality by AI.

Best example that highlights this difference in attitude would be that of 'Suryast,' an art piece created by one Ankit Sahni. Ankit Sahni is a multifaceted artist and lawyer who used an AI-powered tool named RAGHAV ('Robust Artificially Intelligent Graphics and Art Visualizer') to create 'Suryast'. Ankit Sahni received registration for his 'Suryast' in November 2020 through the Indian Copyright Office, thereby making him the first person to receive protection for his AI-generated artworks but there was a withdrawal application that casts a question on whether RAGHAV itself has a recognized legal position in India.

Pointing to the most pertinent portions of Section 2(d)(iii) and 2(d)(vi) in the Indian Copyright Act 1957, the notice highlighted the need for an 'author' to be an 'artist' or a 'person who facilitates the creation of an artistic work'. The United States Copyright Office too rejected copyright registration as they stated that there was no human imprint of authorship. The Copyright Review Board upheld the rejection of the United States Copyright Office (USCO) of Sahni's copyright application. They argued that RAGHAV's rendering of Sahni's picture came from the model's training and not any specific efforts or directions provided by Sahni himself. The decision of the Board relies largely upon the [202]Thaler v. Perlmutter court case in the United States District Court. [203]Even the United States Court of Appeals said in this case that human authorship is a necessary requirement and all original works of authorship are to be created in the first instance by a human being which includes those who make

[202] *Thaler v. Perlmutter,* No. 22-cv-384-BAH (U.S. District Court for the District of Columbia, Aug. 18, 2023)
[203] *Thaler v. Perlmutter*, No. 23-5233 (U.S. Court of Appeals for the District of Columbia Circuit, Mar. 18, 2025).

work for hire. The court based it on the US Copyright Act which only protects original works of authorship as per [204]title 17 of Copyrights law section 102(a)

THE EFFECTS OF AI TRAINING MECHANISMS ON COPYRIGHTS AND INTELLECTUAL PROPERTY RIGHTS

The training of large language models (LLM)[205] as well as the widespread usage of GenAI has identified a set of complexes evolving legal issues surrounding the usage of GenAI technologies. Specifically, regarding copyright law and the concept of authorship.[206]A copyright gives the creator all rights pertinent to the usage, distribution and modification of their work for a temporary period of time. Intellectual property right (IPR) is generally the totality of legal rights designed to protect human creativity which includes artwork, patents, designs, and images.

The Emergence of AI as an additional creator goes on to directly contradict the entire structure of law in place revolving around the human creator.[207] This brings in a series of complexities in place like for example when an artist uses the GenAI platform to create a digital piece of artwork where the AI generates the artwork using inspiration and style drawn from LLM trained copyrighted works. [208]Lack of a conventional authoring mechanism in AI-driven content production means that profits and income will be in favour of those who own or control the AI technology or platforms rather than in favour of original creators.

This could have a major effect on artists, writers, or other human creators in terms of possibly causing economic inequalities[209] and denigration of human creative efforts. [210]It is therefore imperative to strike a balance between technological innovation in terms of what is currently achievable through Gen AI combining with protecting the rights to economic reward in favour of content creators.

ANALYSATION OF VARIOUS LEGAL FRAMEWORKS IN REGARDS TO AI USAGE

BERNE CONVENTION

[204] *Title 17 of the United States Code* (Copyrights) (2025). U.S. Copyright Office. https://www.copyright.gov/title17/

[205] Bonadio, E., Dinev, P., & McDonagh, L. (2022). *Can artificial intelligence infringe copyright? Some reflections*. In R. Abbott & D. Geffen (Eds.), *Research Handbook on Intellectual Property and Artificial Intelligence* (pp. 245–257). Edward Elgar Publishing. https://doi.org/10.4337/9781800881907.00019

[206] Hugenholtz, P. B., & Quintais, J. P. (2021). *Copyright and artificial creation: Does EU copyright law protect AI-assisted output? IIC – International Review of Intellectual Property and Competition Law*, *52*(9), 1190–1216. https://doi.org/10.1007/s40319-021-01098-2

[207] Liu, Y. C., Kuo, C. H., Wang, G. H., & et al**.** (2023). *Dialogues of Liu, Kuo & Wang creation: Collaborative content generation by the human author and ChatGPT and its impact on the evolving intellectual property landscape*. In E. Y. Li et al. (Eds.), *Proceedings of the International Conference on Electronic Business (ICEB 2023)* (Vol. 23, pp. 166–185). Chiayi, Taiwan.

[208] Israhadi, E. I. (2023). *The impact of developments in artificial intelligence on copyright and other intellectual property laws*. *Journal of Law and Sustainable Development*, *11*(11), e1965. https://doi.org/10.38094/jlsd1111965

[209] Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., … Wright, R. (2023). *Opinion paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and*

[210] Lucchi, N**.** (2023). *ChatGPT: A case study on copyright challenges for generative AI systems*. *European Journal of Risk Regulation*, 14**,** 1–23. https://doi.org/10.1017/err.2023.59

The Berne Convention is a cornerstone in the area related to copyrighting and is a brilliant example of the factors affecting the concept of authorship. The international convention aims at ensuring the works are protected globally and benefit the authors and their successors in title. It achieves this by giving the authors the powers to claim their rights and defend their works. The Berne Convention also helps in enhancing the clarity by promoting the act related to dealing with the name or pseudonym of the author thereby removing any doubts in the authors' identity. [211]Although the word "originality" is not defined, it is implicitly contained within article 2(3) where translation, adaptation, musical arrangement, or other modification of a literary or artistic work is to be protected as an original work.

This indicates that such derivative works also qualify for individual copyright protection. The ideal can also be supported by a logical interpretation of Article 2(5). wherein it tackles the issue of collections of literary and artistic works such as encyclopaedias and anthologies. According to Article 2(5) such collections, by reason of their selection and arrangement of the contained work will qualify as intellectual creations. Thus, Article 2(5) establishes the point that such arrangement and compilation qualify as results of intellectual creativity and work which are separate and distinct from the copyrights held by the contained work. The Berne Convention emphasizes and establishes the importance of protecting the copyright of any work involving intellectual creation as long as such work qualifies by showing its creator or author the required intellectual creativity and originality.

However, it does not specifically cover the eligibility of AI output because such works were not in contemplation at the time of its adoption. It is worth noting that the convention also provides leeway to allow national laws to determine the conditions under which the work must be fixed in order to be under the protection of copyright. In that regard under the convention, national laws may adjust the determination of how AI's product can be copyrighted.

EU'S COPYRIGHT LAW

There are 13 directives and 2 regulations which make up EU copyright law which harmonise basic rights in authors, performers, producers, and broadcasters.[212] The setting of harmonised standards of copyright law in the EU reduces the discrepancies that exist within the countries ensuring that the level of protection required for the creation of art and increase of creativity among others exists. The harmonised standards have fostered diversity, improved access to digital content, and services. Many of these directives incorporate disciplines reflected in the Berne Convention and the Rome Convention which includes disciplines imposed on the European Union and its Member States. They also have obligation to comply with disciplines provided through the World Trade Organization TRIPS Agreement, and the two World Intellectual Property Organization Internet Treaties of 1996 which is both the WIPO 'Copyright Treaty' and the WIPO 'Performances and Phonograms Treaty'.

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[211] *Berne Convention for the Protection of Literary and Artistic Works*, (1886), as amended. World Intellectual Property Organization. https://www.wipo.int/wipolex/en/text/283698

[212] European Commission. (n.d.). *Copyright legislation*. Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/policies/copyright-legislation.

The Directive 2001/29/ EC of the European parliament and of the council in 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society is one of the most important directives.[213] Where article 2 of this directive states reproduction right where "Member States shall provide for the exclusive right to authorise or prohibit their direct or indirect, temporary or permanent reproduction by any means or form, either whole or in part:

(a) for authors, of their works;

(b) for performers, of fixations of their performances;

(c) for phonogram producers, their phonograms; etc"

The Article 3 of this directive states the right to publicly communicate works and the right to create where member states must grant authors the sole right to allow or disallow any public dissemination of their creations by wired or wireless methods which also includes the provision to the public of their creations so that the public can access them. Article 4 outlines the distribution right which requires Member States to ensure that authors are granted rights that concerns the original of their creations or any reproductions of their craft.

There are some exemptions or restrictions on the reproduction right specified in Article 2 which are applied in these instances:

(a) Reproductions on paper or any comparable medium where they are influenced by the application of any type of photographic method etc as long as the right holder is compensated

(b) Regarding copies on any medium created by an individual for personal use and for purposes that are not explicitly or indirectly commercial as long as the rights holders obtain remuneration.

The directive also states that Member States may establish exceptions or limitations to the rights granted in Articles 2 and 3 in where utilization solely for the aim of illustration in teaching or scientific research where the source with the author's name is acknowledged and there are many exceptions for instance using for benefit of disable person or religious purposes.

[214]Another important Directive is the (EU) 2019/790 of the European parliament and of the council in 17 April 2019 on copyright and related rights in the digital single market and amending directives 96/9/EC and 2001/29/EC. It clearly states that in some cases, text and data mining may entail actions safeguarded by copyright, it can be the sui generis database right where the reproduction of works or other subject matter are concerned. When there is extraction of contents from a database where the data are standardized during text and data mining and there is no exception or limitation that exists then permission is necessary from rights holders.

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[213] *Directive 2001/29/*EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, OJ L 167, 10–19 (2001). https://eur-lex.europa.eu/eli/dir/2001/29/oj/eng

[214] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC,* OJ L 130, 92–125 (2019). https://eur-lex.europa.eu/eli/dir/2019/790/oj/eng

Article 15 of this directive specifies the safeguarding of press publications related to online applications whereby Member States are required to grant publishers of press publications located in a Member State the rights outlined in Article 2 and Article 3(2) of Directive 2001/29/EC for the online utilization of their press publications by providers of information society services. It's important to note that the rights specified in the first subparagraph are not applicable to private or non-commercial uses of press publications by single users. Also, the safeguard provided in the first subparagraph does not extend to hyperlinking actions. The main aim of the EU copyright law is to ensure that authors are not at loss due to unauthorised use and others don't make profits out of copyrighted works without holder's consent.

US COPYRIGHT ACT

The question of whether AI-generated works like the texts from ChatGPT or images from Midjourney can be protected by copyright primarily rests on the legal concept of "authorship."[215] The Intellectual Property (IP) Clause found in Article I, Section 8, Clause 8 of the U.S. Constitution gives Congress the power to " To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." The Copyright Act grants copyright protection for "original works of authorship" in accordance with this authority. Despite the lack of a clear definition of "author" in the Constitution and Copyright Act, U.S. courts have not yet recognized copyright for works without a human creator such as those produced autonomously by artificial intelligence (AI) systems.

At least one lawsuit has so far unsuccessfully contested the requirement for human authorship in relation to AI.[216] In June 2022, Stephen Thaler filed a lawsuit against the Copyright Office for rejecting his request to register a visual artwork that he asserts was created "autonomously" by an AI system. Dr. Thaler maintained that the Copyright Act does not necessitate human authorship. In August 2023, a U.S. district court ruled in favour of the Copyright Office. The court determined that human authorship is a fundamental aspect of a legitimate copyright claim emphasizing that only human creators require copyright as motivation to produce expressive works.[217]

In March 2025, the U.S. Court of Appeals for the D.C. Circuit upheld the district court's ruling in Thaler v. Perlmutter where they determined that the Copyright Act mandates all qualifying work to be initially created by a human. The court concluded that multiple sections of the Copyright Act suggest that the term "author" is intended exclusively for human beings. [218]

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[215] Zirpoli, C. T. (2025). *Generative artificial intelligence and copyright law* (CRS Legal Sidebar No. LSB10922). Congressional Research Service. https://www.congress.gov/crs-product/LSB10922

[216] *Thaler v. Perlmutter,* No. 22-cv-384-BAH (U.S. District Court for the District of Columbia, Aug. 18, 2023)

[217] *Thaler v. Perlmutter*, No. 23-5233 **(**U.S. Court of Appeals for the District of Columbia Circuit, Mar. 18, 2025).

[218] U.S. Copyright Office. (2023, March 16). *Copyright registration guidance: Works containing material generated by artificial intelligence* (88 Fed. Reg. 16190) (Statement of policy), Federal Register. https://www.govinfo.gov/content/pkg/FR-2023-03-16/pdf/2023-05321.pd

In March 2023, the Copyright Office published Copyright Registration Guidance on works that include material produced by AI (the AI Guidance). In recognition of the fact that human authors can use AI in their creative process, the AI Guidance states that the key factor is the degree of creative control the human exercised over the work's expression. Accordingly, the AI Guidance states that where AI decides the expressive components of its output, the produced content is not a result of human authorship. However, works that include AI-generated content can be protected by copyright under certain circumstances like where there are sufficiently creative human modifications or adaptations of AI-generated content or where they combine AI-generated and human-authored content. The AI Guidance provides that copyright protection can be claimed only for their own contributions to such works and that they must acknowledge and claim the AI-generated portions of the works in their application for copyright registration.[219]

In January 2025, the Copyright Office published the part of its report on Copyright and Artificial Intelligence that deals with the copyright status of works produced using AI. Citing the AI Guidance's emphasis on creative control, the report emphasizes that with the technology currently accessible, prompts alone do not provide sufficient human control for users of an AI system to be considered the authors of the resulting work. The report goes on to say that the Copyright Act's distinction between copyrightable works and uncopyrightable ideas makes works produced by AI using user input uncopyrightable because they are ideas.[220]

On March 21, 2024, the state of Tennessee enacted the Ensuring Likeness, Voice, and Image Security (ELVIS) Act of 2024, which expands the state's legal right of publicity (ROP) and presents new risks of liability for artificial intelligence services, online platforms, and technology companies that use voices and likenesses of artists. The act became effective on July 1, 2024.[221]

The ELVIS Act amends the Tennessee Personal Rights Protection Act of 1984 in two significant respects. First, it expands existing law (section 47-25-1105) to prohibit any unauthorized commercial use of a person's voice and gives more restrictions on the use of a person's name, image, and likeness. The Act defines "voice" as a sound in a medium that is easily recognizable and assignable to a specific person, regardless of whether the sound is the actual voice or an imitation of the voice of the person. This broad definition raises the question of whether liability under the ELVIS Act might be imposed not only on the use of an existing sound recording of a person's voice but also on the creation of digital recordings or audiovisual works that are similar to personal voices. Currently AI works are under the

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[219] U.S. Copyright Office. (2025*). Copyright and artificial intelligence, Part 2: Copyrightability* (Report of the Register of Copyrights). https://www.copyright.gov/ai/Copyright-and-Artificial-Intelligence-Part-2-Copyrightability-Report.pdf

[220] Damle, S., Dukanovic, I., Lovejoy, B., & Stillman, A. (2024, April 8). *The ELVIS Act: Tennessee shakes up its right of publicity law and takes on generative AI* (Client Alert No. 3244). Latham & Watkins. https://www.lw.com/admin/upload/SiteAttachments/The-ELVIS-Act-Tennessee-Shakes-Up-Its-Right-of-Publicity-Law-and-Takes-On-Generative-AI.pdf

[221] Tennessee Code Annotated § 47-25-1105 (2021*).* Retrieved from https://law.justia.com/codes/tennessee/2021/title-47/chapter-25/part-11/section-47-25-1105/

scrutiny of the copyright office to judge whether they are truly human creation. The office uses its various guidelines and precedent of cases involving AI generated works to judge works.

INDIA'S COPYRIGHT LAW

Currently, the Indian copyright laws lack provisions regarding works produced by AI. The Copyright Act of 1957 in India has seen progressive developments.[222] It was amended to align with the TRIPS Agreement for international compliance and later it was amended again to strengthen strong digital protections and recognized online rights but there is a need to have rules regarding works produced by AI. In India, the RAGHAV AI case involved Ankit Sahni, the developer of the RAGHAV (Robust Artificially Intelligent Graphics and Art Visualizer) application who applied for copyright protection for an AI-produced work titled "Suryast." The Indian Copyright Office initially issued a registration notification in November 2020, recognizing RAGHAV as a co-author with Sahni. However, the Copyright Office later published a notice of withdrawal which casts uncertainty on the legal status of the AI application.

Although the Copyright Act of 1957 in India does not provide any specific provisions for works produced through AI, it has already recognized the rights of performers under Section 38 of the Copyright Act, as well as the producers of phonograms under Section 14(e) in combination with Section 2(xx), as well as broadcasting organizations under Section 37.

Already the recording of performances or broadcasts enjoys protection against unauthorized copying and public distribution. when computer-generated results appear in the form of recordings or audiovisual products, it raises complex regulatory questions about licensing, remuneration, and enforcement. It is therefore important that Indian policymakers consider both copyright and related rights regimes when addressing AI imagination.[223]

Section 52 of the Copyright Act protects the specific use of copyrighted works for the purpose of benefiting society at large without unreasonably affecting the rights of the original author. It recognizes that the right of copyright is not absolute and has to be harmonized with the needs of society such as education and the dissemination of information. This section applies to all types of works that includes literary works, musical works, artistic works, cinematic works, and sound recordings etc.

ANALYSIS OF ONGOING CASE LAWS REGARDING COPYRIGHT AND AI USAGE

BARTZ V. ANTHROPIC, 3:24-CV-05417 (N.D. CAL.)

At Anthropic, three authors filed a class action alleging that their copyrights were violated due to Anthropic's training of its AI service called Claude. To train Claude, Anthropic acquired millions of

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[222] Ojha, A. (2025). *AI & copyright in India: Law, policy, and the future of creative rights* (Case study). National e-Governance Division, Ministry of Electronics & Information Technology, Government of India. https://negd.gov.in/wp-content/uploads/2025/10/Astha-Ojha-AI-Copyright-in-India-Bridging-the-Digital-Divide.pdf

[223] *Copyright Act, 1957, § 52* (India). Retrieved from https://www.indiacode.nic.in/show-data?actid=AC_CEN_9_30_00006_195714_1517807321712&sectionId=14572&sectionno=52&orderno=70

illegal books. It also acquired millions of tangible books, digitized them, and disposed of the originals. Anthropic utilized these shared copies to establish a central repository of the books. Anthropic subsequently chose different subsets of both the pirated and digitized materials from that library to train the large language models (LLM) utilized in Claude. It kept all the copies in the main library for any future needs that may come up. Before class certification, Anthropic filed a motion for summary judgment regarding its fair use defence.

In its motion, Anthropic contended it replicated the authors' works for a singular purpose which is to train LLMs. The authors claimed that Anthropic duplicated the books for two purposes which to train the LLMs and to create a large central repository of possibly valuable material. Judge Alsup ultimately evaluated both applications and both collections of works (the pirated books and the digitized hardcopy editions). For each instance, he utilized the four fair use criteria specified in section 107 of the US Copyright Act. Judge Alsup held that the use of the works to train the LLM was fair use. The heart of his decision was that the use of the works to train the AI was highly transformative and that no copies of the books were available to the public.

Judge Alsup also held that the use of the works to train LLMs would not affect the market for the works. First, he rejected the argument that training LLMs would cause a flood of competing works. Moreover, he rejected the authors' argument that the infringement would reduce their licensing market for training LLMs. He held that a hypothetical licensing market is not one that the Copyright Act guarantees authors the right to use.

[224] In June 2025, Judge William Alsup of the Northern District of California issued a major summary judgment ruling. He held that Anthropic's use of legally obtained books for AI training was "fundamentally transformative" and thus protected by fair use. At the same time, he also held that Anthropic's creation and maintenance of a "central library" containing a partial mix of the pirated works was non-transformative and constituted infringement. This simultaneous defeat and victory prefaced the trial on damages. The latest Court order was on January 27, 2026 is regarding the opt-out and objections deadlines which are modified to be February 9, 2026 and the Plaintiffs to immediately disseminate the email notice.

KADREY V. META PLATFORMS, INC., 3:23-CV-03417, (N.D. CAL.)

On June 25, 2025, the Northern District of California decided whether Meta's use of copyrighted books for training its LLAMA language models constituted fair use under [225]17 U.S.C. § 107. The plaintiffs, a group of famous authors including Sarah Silverman and Junot Díaz, alleged that Meta accessed their works through shadow libraries and incorporating them into the datasets used to train Meta's LLAMA models 1, 2, and 3. Meta acknowledged the downloading of copyrighted books through BitTorrent and their incorporation into the datasets.

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[224] *Bartz v. Anthropic*, No. 3:24-cv-05417 (N.D. Cal. 2024).

[225] 17 U.S.C. § 107 (2025). *Limitations on exclusive rights*: Fair use. Legal Information Institute, Cornell Law School. https://www.law.cornell.edu/uscode/text/17/107

Finally, Judge Chhabria held that:

(i) Meta's use of the works to train an LLM was fair use because of the transformative nature of the use and would not affect the authors' market;

(ii) The market for authors to license their works for AI training was irrelevant to the fair use analysis; and

(iii) A determination of no fair use would not impede AI innovation.

Meta offered evidence that its use of the plaintiffs' books to train Llama did not affect the sales of the plaintiffs' books. The plaintiffs did not offer any evidence to refute this. Judge Chhabria explained that the notion of market dilution was especially relevant to the fair use analysis in light of the ability of LLMs to flood the market with competing works.

While Judge Chhabria did rule in Meta's favour, he rejected the company's claim that failing to prevent Meta from using copyrighted books to train its LLMs would stifle technological progress. Judge Chhabria stated that these AI tools are expected to generate billions, even trillions of dollars for the companies that develop them and found it ridiculous that copyright enforcement would halt this technology in its tracks. Judge Chhabria further explained that a ruling against fair use does not mean that AI companies must stop developing their technology but that they must pay licenses to use copyrighted materials for training. Kadrey v. Meta Platforms, Inc. is presently in administrative motion to consider whether another party's material should be sealed where plaintiffs are filing an expert declaration fully under seal because it potentially contains information that Meta will move to seal.

ARIJIT SINGH V. CODIBLE VENTURES LLP, 2024 SCC ONLINE BOM 2445

In the case of Arijit Singh v. Codible Ventures LLP & Ors., the rationale for the Bombay High Court's grant of an ex-parte ad-interim injunction is based on precedential principles relating to personality rights and interim relief as applied to the emerging threat of generative artificial intelligence.

At the outset, the Court held that the Plaintiff had made out a strong prima facie case of infringement of personality rights and the right of publicity. It was evident from the record that several of the defendants were using the Plaintiff's name, voice, vocal style, image, likeness, and overall persona in AI-generated works without authorization. The Court noted that the Plaintiff was readily identifiable in the impugned acts meeting the requirement that personality characteristics must unambiguously refer to the particular individual.

A central and novel aspect of the Court's reasoning lies in its treatment of AI-enabled voice conversion and generative content. The Court expressly recognized a celebrity's voice as an integral component of personal identity and public persona. It held that AI tools enabling the conversion or synthesis of a celebrity's voice without permission facilitate unauthorized appropriation and manipulation of identity which constitutes a direct violation of personality and publicity rights. The Court emphasizes that such

technological exploitation magnifies the scale, realism, and potential harm of infringement which exposes performers to heightened vulnerability in the digital ecosystem.

The Court further noted that the defendants' activities were commercial in nature aimed at attracting traffic, monetizing platforms, and selling merchandise by capitalizing on the Plaintiff's popularity and reputation. The Plaintiff's pleaded decision to refrain from endorsements and gross commercialization was treated as reinforcing his right to control the use of his identity.

The Court held that the balance of convenience was decisively in favour of the Plaintiff and that further exploitation would result in irreparable harm to the Plaintiff's career, reputation, and livelihood which could not be adequately compensated by monetary relief.

GETTY IMAGES AND OTHERS V. STABILITY AI [2025] EWHC 38 (CH).

On 4 November 2025, the High Court of England and Wales delivered its long-awaited decision in the case of Getty Images v. Stability AI which was brought by several entities within the Getty Images group together with a contributing entity (collectively, Getty) mainly on the grounds that Stability AI had infringed the intellectual property rights owned by Getty in the development, training, and use of Stability AI's Stable Diffusion image-generation AI model.

The Court mainly threw out the infringement claims brought before it by Getty, except for a few specific findings in respect of its trademark claim. Notably, the Court also dismissed Getty's secondary claim of copyright infringement in respect of Stability AI's Stable Diffusion, on the grounds that it was an "infringing copy" of "an article" containing Getty's alleged copyright works as it had been imported into the UK and its manufacture in the UK would have constituted copyright infringement of those works under the Copyright, Designs and Patents Act 1988 (CDPA).

Significantly, the Court that an "article" in relation to secondary infringement under Sections 22 and 23 of the CDPA may be intangible. Examining Sections 22 and 23 alongside Section 27 (which defines "infringing copy") and Section 17 (which outlines what constitutes "copying"), the Court determined that "article" is not limited to physical forms; electronic copies held in intangible forms (e.g., in cloud storage) may qualify as "articles."

The Court arrived at this conclusion by using the "always speaking" principle (i.e., that laws should be interpreted to address new situations and technologies as they develop) and a comprehensive interpretation of the CDPA, highlighting that Section 17 explicitly acknowledges copying through storage "in any medium by electronic means" and that refusing protection against secondary infringement simply because the storage medium is intangible instead of tangible would contradict those provisions.

Nonetheless, the Court determined that Stable Diffusion does not qualify as an "infringing copy" according to Section 27. The critical element was that every model version of Stable Diffusion in its concluding form do not and have not held reproductions of Getty's claimed copyright works since they result from training and are not actual replicas of the pertinent works.

Presently the High Court has granted Getty Images the permission to appeal against the recent landmark ruling that rejected Getty's claims of secondary copyright infringement against Stability AI.

PROPOSAL OF LEGAL REFORMS AND POLICY RECOMMENDATIONS

There should be a uniform approach to AI generated work and the category of what constitutes a legitimate work that allows permission for the copyright registration. This should be based upon the creative or original input given by the author. Presently AI is used everywhere from searching to analysing. Instead of viewing AI as a copycat producer, countries should implement universal standards of analysing whether usage of AI generation involves total content taken from other copyrighted works or was influenced by other copyrighted works.

There should be some intake in the approach of the European Union which involves an "opt-out" option, whereby right holders can take reasonable steps to prevent the developers of AI systems from accessing their protected works for reproduction and training purposes.[226] Right holders can particularly restrict the use of their works by other people for the purpose of data analysis of this nature including works that can be processed by computers.

Copyright exceptions for Text and Data Mining (TDM) enable the copying of copyrighted material for analysis without the need for authorization, which is essential for AI development.[227] Best practices have been developed in the EU (Articles 3 & 4 of the DSM Directive) and the UK (S29A Copyright Act) which typically require "lawful access" to data. While exceptions for research are mandatory, they may not be for commercial TDM.

The organizations or entities participating in TDM must respect the reservations and refrain from copying protected works for training.[228]There is much ambiguity regarding the implementation of the "opt-out" system so countries should specify clauses to avoid discrepancies. Another aspect is that the work must have been "legally obtained". This is observed in countries such as the EU and Singapore.

Countries should conceptualize an exception with a carefully crafted phrase that allows for commercial use and the words that are crafted to specifically include the training of AI and address some of the concerns mentioned above. It is to be noted that an exception without an "opt-out" provision undermines the interests of copyright holders as they will not receive any benefit or compensation despite their works being copied in the process of training AI Systems by AI Developers who may have business-related motives.

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[226] Geiger, C., Frosio, G., & Bulayenko, O. (2018). *The exception for text and data mining (TDM) in the proposed Directive on Copyright in the Digital Single Market* – Legal aspects (CEIPI Research Paper No. 2018-02). Centre for International Intellectual Property Studies. https://doi.org/10.2139/ssrn.3160586

[227] Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, Government of India. (2025, December). *Working paper on generative AI and copyright* (Working Paper). https://www.dpiit.gov.in/static/uploads/2025/12/ff266bbeed10c48e3479c941484f3525.pdf

[228] Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, Government of India. (2025, December). *Working paper on generative AI and copyright* (Working Paper). https://www.dpiit.gov.in/static/uploads/2025/12/ff266bbeed10c48e3479c941484f3525.pdf

This can be countered by giving disclaimer about information that is generated from copyrighted work or highly influenced by it. Suppose AI generates some image or text; there should be clear indication about its original source and authenticity. This will ensure that interest of copyright holders about their acknowledgement of their work is met.

AI companies should follow proper guidelines about which content to be used for learning model, illegal websites or pirate content should be not used. Countries should have proper legislation and penalise those who refuse to follow it.

CONCLUSION

The accelerated development of artificial intelligence has caused a paradigm shift in the traditional copyright regime which is based on human authorship and creativity. The current intellectual property regimes of both national and international level are increasingly challenged by the emergence of AI-authored and AI-assisted works. A comparison of the Berne Convention, EU copyright law, the U.S. Copyright Act, and the Indian Copyright Act of 1957 shows that all these regimes have not explicitly mentioned non-human authorship. The judicial treatment of AI-related cases in different jurisdictions indicates that there is a growing consensus that AI training can be considered a form of transformative use under fair use provisions but courts are reluctant to grant copyright protection to autonomous AI works. Recent cases such as Bartz v. Anthropic, Kadrey v. Meta, Getty Images v. Stability AI, and Arijit Singh v. Codible Ventures LLP demonstrate the conflict between technological progress, economic rights, and personality rights in the digital environment. The lack of standardized legal frameworks could exacerbate disparities between AI innovators and human creators which can potentially jeopardizing the very incentive structure that copyright law aims to safeguard. Accordingly, there should be a rebalanced copyright framework where there is maintenance of human creativity but also provides exceptions, opt-out arrangements, transparency requirements and fair remuneration terms to facilitate innovation enabled by AI technology. In the end, sustainable growth in the AI-enabled world can be realized only through international collaboration, dynamic legal adaptation, and a harmonious approach that balances technological advancement with human creative endeavour.

DATASET TRANSPARENCY AND COPYRIGHT ACCOUNTABILITY IN AI TRAINING SYSTEMS

Ruchi Baid*

ABSTRACT

AI companies are reluctant to reveal their training datasets, arguing that it could expose trade secrets, compromise proprietary algorithms, or reveal sensitive personal data. However, without knowing what is being fed to the algorithms, it becomes nearly impossible for the rightsholder or artist to prove that their work has been used without their permission. The case of Hayao Miyazaki is a prime example. Despite his public opposition to AI-generated Ghibli-style art, there was no easy way for him to verify whether his works were used in training models, leaving him powerless to enforce his rights. This paper argues that when artists cannot know whether their works have been used to train AI systems, copyright protection becomes illusory rather than real. Further, the onus of proof for copyright infringement allegations requires that plaintiffs prove unlawful use and sufficient similarity between the work and the copyrighted work being copied. In the context of AI technology, establishing the burden of proof becomes exceedingly difficult, if not impossible, when the underlying data utilized lacks transparency and remains undisclosed. This state of affairs also brings about asymmetry because artists cannot prove their rights without knowledge about the data used by developers of AI. The issue is further complicated by the nature of generative AI models, which do not store or reproduce specific images but learn patterns and styles from large datasets. As a result, proving the case of direct copying is significantly problematic since the outputs are not literal copies but synthetic generations based on learned features. The paper proposes policy reforms and provenance tools (Whitebox AI, watermarking, cryptographic hashing, blockchain tracking) to verify usage, enforce rights, and require dataset disclosure. The absence of these tools and a legal disclosure mandate currently permits unauthorized exploitation of artists' work, thus weakening copyright protection.

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KEYWORDS: Generative Artificial Intelligence, Copyright Infringement, AI Training Data, Algorithmic Accountability, Fair Use and Fair Dealing, Protection of Creative Labour.

INTRODUCTION

Copyright law has changed a lot over time because of technology like the printing press and cameras, and now the internet. Each time something new came along, it made people question the rules about copyright, but nothing has shaken the very basics of copyright law as much, as Generative Artificial Intelligence (AI), which can create things on its own. Generative AI is different from other technologies. It does not just copy creative things. It actually learns from them. This happens when the AI looks at a lot of text, images, films, and music. The AI system starts to understand the patterns that make these things expressive, then it creates work similar to what artists create, and all this happens inside the AI algorithm system without the process being visible to the general public or to artists.

At the centre of this transformation lies a critical but unresolved question: Who is training these models, and whose creative labour is being used in the process?

This paper argues that the refusal of AI developers to disclose training datasets has produced a structural collapse of copyright enforcement. When artists cannot know whether their works have been used, they cannot assert infringement. Copyright protection in such circumstances just becomes illusory.

THE PROBLEM OF DATASET OPACITY IN GENERATIVE AI

Dataset opacity[229] indicates the lack of transparency when it comes to provenience, composition and use of databases, used to train artificial intelligence engines. Opacity in the generative AI environment is present when the developers do not make public information about the inclusion of copyrighted literary, artistic, or audiovisual works in training corpora. This lack of disclosure has manifested itself as one of the most dominant structural problems in modern copyright jurisprudence.

Generative AI systems are based on large collections of corpora in the form of textual, visual, musical, and audiovisual data collected via web scraping, licensed repositories, or amalgamated public databases. During the learning stage, these corpora are transformed into numbered vectors, which help models to identify style patterns, linguistic forms, and

[229] Adam Buick. Copyright and AI training data transparency to the rescue? Journal of Intellectual Property Law & Practice. Volume 20 Issue 3. March 2025. Pages 182–192. https://doi.org/10.1093/jiplp/jpae102

composition techniques. Although pattern recognition is a common term practitioners use to describe this operation, jurisprudence and scholarship are increasingly recognizing the reproduction of copyrighted works to be part of machine learning training, as well as the computational analysis of such works. As Lemley and Casey[230] argue, machine learning can be considered as the copying on an unprecedented magnitude, where the copyrighted media informs the functioning structure of the AI systems as an attempt.

Opacity of datasets has serious legal implications. The developers often conceal disclosures about training datasets, providing reasons of safeguarding trade secrets, design of algorithms, and positioning. Even though such arguments might be economically justified, they create an unequal structure between the creators of AI and the owners of copyright. The developers have the exclusive information on dataset composition, and the creators do not have any facility to determine whether their creations are being used in training procedures. Such an imbalance will reduce the enforceability of copyright protections.

Traditional definitions of the infringement of copyright require that the plaintiffs prove that they had access to the original work and that there is some material similarity between the alleged work that infringed and the work under protection. In the situation of the dataset opacities, though, access is established almost impossible. The intermediate or ephemeral copying has long been recognized as infringement by the courts, as was the case in the case of MAI Systems Corp. v. Peak Computer, Inc,[231] where the Ninth Circuit determined that loading computer software into a computer memory created an infringement of copyright. Similarly, these steps of digesting and training the AI might also constitute reproduction of copyrighted works. However, where no disclosure of data is made, plaintiffs do not have the evidentiary test necessary to initiate such actions.

This case directly supports the central argument advanced in this paper: copyright harm in generative AI systems often arises at the input stage rather than at the output stage. Traditionally, infringement analysis has focused on whether the final product reproduces protected expression.

THE BURDEN OF PROOF IN AI COPYRIGHT INFRINGEMENT

Within the copyright law, even an act of a simple demonstration of stylistic similarity is not considered infringement. Copyright is a safeguard of the original expression of an author and

[230] Lemley, Mark A. and Casey, Bryan, Fair Learning (January 30, 2020). Available at SSRN: http://dx.doi.org/10.2139/ssrn.3528447

[231] MAI Systems Corp. v. Peak Computer, Inc., 991 F.2d 511 (9th Cir. 1993).

not abstract ideas or artistic style. The distinctive aesthetic of Studio Ghibli[232] cannot be protected, despite individual Ghibli works otherwise qualifying for protection under copyright. To win the case concerning the infringement, a plaintiff needs to ordinarily prove (a) that the defendant accessed the copyrighted work, and (b) that the supposedly infringing production is substantially similar in the expression that it is actually protected. The first one is usually met by demonstrating that the accused had access to the original. The necessity of copying, in its turn, presupposes proving that the content that was secured was in fact used.

With regard to generative forms of artificial intelligence, such requirements are specifically hard to meet. Plaintiffs need to demonstrate that the plaintiff's work was included in the model training data. A ruling by the courts has said that copying evidence has to go beyond stylistic similarity. For example, in Getty Images v. Stability AI,[233] the court noted that a claimant has to prove that works have been (i) downloaded; (ii) by the defendant and (iii) within the boundaries of the jurisdiction of the United Kingdom. In the case of AI companies refusing to disclose their training datasets, the plaintiffs can often not meet these conditions.

Once a copying has been proved, then the plaintiff needs to demonstrate substantial components of the plaintiff's work in the output of the AI. Models produce new images or text that can only partially coincide with the inputs. The UK court admitted that models do not hold a copy of the photographs, thus ruling out the possibility of the model being a literal reproduction of the input. This fact undermines the arguments of verbatim copying. As a result, the courts decide based on the presence of enough elements of the expression that has been protected by the author in the output to qualify as infringement.

The plaintiff has a foregone burden of providing the burden of proof. According to the United States and other courts, plaintiffs are expected to prove real harm or loss (i.e., lost revenue or reputation damage). In Raw Story Media v. Open AI,[234] the case was dismissed after the defendant was unable to determine a particular article replicated by the language model and a resultant loss of income. The TechPolicy Analysis inferred that to achieve success in a court, there has to be evidence of material harm, like when an AI result or output is used to weaken a paywall or replace a business opportunity. In line with this, the plaintiffs will have to prove that their works were actually utilized and also had a significant negative effect on their market.

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[232] Studio Ghibli vs AI: tribute or copyright infringement? (2025, April 15). IP Helpdesk. European Commission https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/studio-ghibli-vs-ai-tribute-or-copyright-infringement-2025-04-15_en#:~:text=From%20a%20legal%20point%20of,there%20could%20be%20an%20infringement

[233] Getty Images Inc. & Ors v. Stability AI Ltd. [2025] EWHC 2863 (the Ch) (Nov. 4, 2025).

[234] Raw Story Media, Inc. et al v. OpenAI Inc. et al, 1:24-cv-01514 (S.D.N.Y. Feb. 28, 2024).

These standards of evidence represent a virtually impossible obstacle in case training data are considered to be confidential. Without transparency, an artist cannot even determine whether an AI has been trained on their work, not to mention correlating a certain output with a particular work that he or she produced. Such a lack of access to the underlying data typically prevents the plaintiffs from providing tangible evidence. In line with this, courts will hardly incur to copy-cut stylized outputs.

EVOLVING JUDICIAL APPROACHES TO COPYRIGHT LIABILITY IN GENERATIVE AI

However, now courts are beginning to consider whether the reproduction of copyrighted works during training itself may be legally actionable. This changing view highlights a legal observation that infringement that can be ascribed to generative AI can occur at the time of ingesting the data and not solely by the final generated product.

One of the prominent trends is the lawsuits in the case of Andersen v. Stability AI,[235] in which a group of visual artists have filed proceedings against generative AI image-generation systems developers under the copyright infringement statute. Many of the past cases where AI came into conflict with copyright were often dismissed during the initial phase, due to difficulty in proving that there was overt copying. However, in this case, the court has taken a more liberal approach and allowed core copyright claims to proceed. By doing so, the court noted the rights of the model theory, according to which the AI models can contain the transformed iterations of the copyrighted material used in the training. Moreover, the court also acknowledged the distribution theory that argues that the spreading of AI-powered systems that are to be used with reference to the copyrighted content can constitute the distribution of infringing content. By permitting the case to move into the discovery stage, the court emphasised that liability may depend on whether protected works are embedded within AI systems in some identifiable or transformed form. This decision represents a significant doctrinal shift, as it acknowledges the possibility that training-stage use of copyrighted works may fall within the scope of infringement analysis.

Accompanying an identical trend is a parallel development of Indian law through a similar approach as it is being experienced in the case of ANI Media Pvt. Ltd. v. OpenAI.[236] The case is the first legal case in India to involve a legal inquiry into whether the use of copyrighted material in training large language models might be considered a fair dealing under Section 52

[235] Andersen, S., et al. v. Stability AI Ltd.. et al. No. 3:23-cv-00201.(N.D. Cal. filed Jan. 13, 2023).
[236] Asian News International (ANI) v. OpenAI Inc. & Anr. CS (COMM) 1028/2024. (Delhi High Court 2024).

of the Copyright Act, 1957.[237] The case foregrounds the basic questions of whether storage or processing or analysis of copyrighted news content in the context of AI training is considered as reproduction, under the Indian copyright law. More importantly, the court case places into focus the lack of express statutory safeguards in terms of the text-and-data mining or AI training within the Indian copyright paradigm. Thus, the case has triggered broader policy reflection and regulatory review, leading to the appointment of expert committees to review possible legislative change. The ANI conflict, therefore, forms a key element in a move toward technological innovation in response to copyright law in new jurisdictions.

COMPARATIVE GLOBAL REGULATORY APPROACHES

With the rapid growth of generative artificial intelligence, different countries have attempted to enact laws in line with their respective priorities in terms of balancing between innovation and copyright protection. The doctrine of fair use is most common in the United States. Courts evaluate whether the use of copyrighted material in an incorporation has become a sufficiently transformative use and whether it will cause harm to the market of the original work. Recent court cases, e.g. Thomson Reuters v. ROSS Intelligence,[238] portray that the artificial intelligence training can be beyond the fair-use protection when the same is used commercially or in competition with the market of the creative work of the original content. Other U.S. cases have, in contrast, confirmed the transformative quality of AI training whereby resultant outputs lack the re-creation of expressive content or something that causes a quantifiable economic harm, which underscores the fact-driven and adaptive nature of American copyright case law.

In contrast, the European Union has taken a more organized regulatory strategy, being implemented in the EU Artificial Intelligence Act[239] and text-and-data mining of the Copyright Directive. Such frameworks clearly acknowledge the possibility of involvement of reproduction rights in the training of AI, and require developers to address transparency principles.

India stands halfway, providing a strong assurance of the protection of the expressive works, but not providing a clear statute concerning AI training at the given moment. This uncertainty[240] is echoed in the constantly pending courts of law, legal cases, and policy

[237] The Copyright Act, 1957. No. 14.Acts of Parliament.1957.
[238] Thomson Reuters Enterprise Centre GmbH v. ROSS Intelligence Inc.No. 1:20-cv-00613-SB. (D. Del. Feb. 11, 2025).
[239] Article 50: Transparency obligations for providers and deployers of certain AI systems | EU Artificial Intelligence Act. (n.d.). https://artificialintelligenceact.eu/article/50/
[240] AI & copyright.Udit Mendiratta.Argus Partners Blog.26th Mar, 2024. https://www.argus-p.com/papers-publications/thought-paper/ai-copy,,,right/

discussions. The differential regulatory methods that are brought into focus by these jurisdictions highlight the lack of a coherent standard due to differences in each jurisdiction‘s priorities and frameworks to balance technological progress and copyright protection.

RECOMMENDATIONS

An important reform involves the evidentiary burden of litigation involving works created through artificial intelligence (AI) and copyright matters. The current legal provisions put the whole burden of the proof on the copyright holders, and they are required to prove access, reproduction, and similarity. Nonetheless, the vagueness of the training data hinders the ability of creators to acquire the evidence that meets these needs. As a result, this asymmetry establishes structural barriers to enforcing it and weakens the strength of the copyright protection.

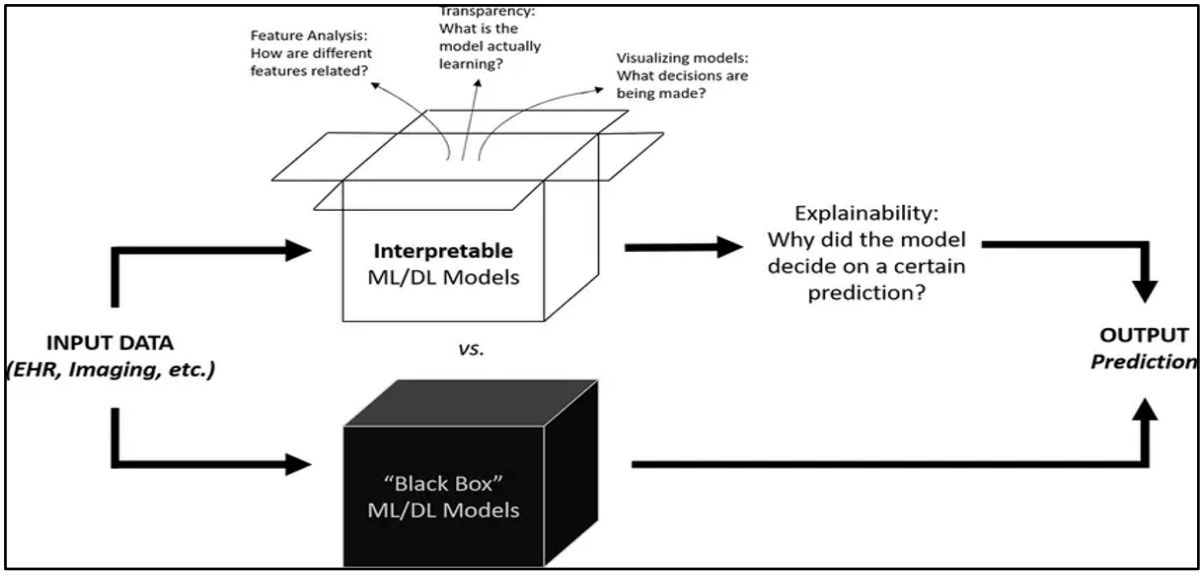
To address this issue, jurisdictions can consider the adoption of rebuttable presumptions in case of AI copyright cases. In this case, the evidence burden may move to the AI developers in a situation where owners of the copyright display a reasonable level of similarity between the works and the outputs created by AI. Such an approach does not eliminate the evidentiary standards, it only readjusts enforcement instruments, accepting the fact that developers have better access to the relevant information.

TECHNICAL SOLUTIONS WHITE-BOX AI AND PROVENANCE MECHANISMS

They should be supplemented by technological interventions that can initiate change in the context of increasing transparency and traceability in the process of AI training. The shift to more transparent or white box AI models, as opposed to opaque or black box models, is an important step towards accountability.

The diagram below[241] compares interpretable models, which can be analysed in terms of features, visualise decision-paths, and provide traceability between inputs and outputs, with black-box models, which are represented by most generative AI solutions and whose outputs are not accompanied by an explanation of internal computations. This lack of explainability in itself contributes to the lack of explainability in datasets and asymmetry of evidence. The developers can achieve the goal of providing auditability by adopting explainable AI frameworks without reducing the technological efficacy.

[241] Hui, Aaron & Ahn, Shawn & Lye, Carolyn & Deng, Jun. (2022). Ethical Challenges of Artificial Intelligence in Health Care: A Narrative Review. Ethics in Biology, Engineering and Medicine: An International Journal. 12. 10.1615/EthicsBiologyEngMed.2022041580.



Source: Research Gate (Ethical Challenges of AI in Health Care, Hui et al.)

White-box artificial intelligence requires[242] interpretable models, such as decision trees, linear regression, and rule-based algorithms, which allow the stakeholders to determine the effect of the input variables on the predictions of the output. This obligatory disclosure makes white-box AI part and parcel of systems of accountability like watermarking, cryptography hashing, and provenance tracing. Since the paths of decision-making of such models are clearly visible, the regulators and the rights holders can easily confirm the influence of the copyrighted works on the output of AI. Hence, white-box AI justifies transparency and eliminates information asymmetry between developers and creators.

White-box AI models, nevertheless, also have serious weaknesses. They work well typically in low- to medium-complexity data climates and are incapable of processing intensely complicated or massive data volumes. In comparison, more developed systems of generative AI (large language models and image diffusion models) make use of black-box neural networks that can analyse large, unstructured data. These models allow an improved predictive accuracy, creative synthesis and scaling, which makes them essential to the modern AI development.

Although black-box AI provides better performance, its inability to produce any form of explanation raises their issues with transparency, as well as copyright protection. In spite of lack of internal transparency in black-box systems, copyright protection can still be achieved by the combination of regulatory disclosure requirements and technological responsibility tools. Seeing that black-box models cannot entirely reveal their learning procedures,

[242] Ihejirika, C. J. (2025). Explainable artificial intelligence in deep learning models for transparent decision-making in high-stakes applications. International Journal of Research Publication and Reviews, 6(2).

governance should be directed to their training-data consumption, traceability of their results, as well as compliance by developers, and not necessarily to the examination of their pathways to arrive at the final decision.

One of the main ways of protecting copyright in black-box AI is related to the disclosure of datasets. Laws and regulations, including the European Union AI Act,[243] require developers to give descriptions or documentation of training datasets used in AI creation. Though not requiring the disclosure of proprietary algorithms, exhaustive data sets etc., this allows the copyright owners to ascertain whether their work has been used in training regimes or not. These transparency provisions reduce the unilateral nature of information, and they enable the rights holders to challenge unwarranted use.

The other course of action is to have training data audit measures. In these systems, training datasets of AI can be reviewed by separate regulatory organizations or accredited auditors under privacy protection. It is a method that allows checking that the copyright has not been violated without compelling the developers to publicly expose commercially sensitive information. A balance between trade-secret security requirements and the requirements of accountability is achieved through confidential audit models.

Efficient protection of copyright in black-box AI can also be provided through technological solutions. Digital watermarking[244] allows authors to add imperceptible identifiers to creative content, allowing them to track their usage by the training datasets or AI results. Similarly, cryptographic hashing gives copyrighted material cryptographic fingerprints that will permit content creators or authorities to identify whether a dataset has been added to a dataset without disclosing proprietary datasets. There are also provenance-tracking systems based on blockchains, which provide secure and irrevocable records that provide a connection between copyrighted content and licensing agreements, as well as the usage of datasets, increasing evidential bases in copyright litigation.

Finally, black-box AI systems require copyright protection, which requires a change in enforcement methods to data-governance transparency, as opposed to algorithmic transparency.[245] Regulatory frameworks are preferring accountability, as demonstrated by

[243] Article 50 & 51: Transparency obligations for providers and deployers of certain AI systems | EU Artificial Intelligence Act. (n.d.).

[244] Gupta, R., EY India, Vij, J., FICCI, & Singh, A. (2024). Identifying AI generated content in the digital age: The role of watermarking [Report].

[245] Rico, Philippe. (2024). AI and Data Governance: A Legal Framework for Algorithmic Accountability and Human Rights.

documentation of datasets, auditability, licensing checking, and provenance tracing, by avoiding the need to disclose the inner workings of the neural network.

CONCLUSION

While regulation is necessary to address copyright challenges in generative AI, excessive or rigid regulation may slow technological innovation by restricting access to training data and increasing compliance costs. Such constraints may discourage research investment and fragment global AI development. However, the absence of regulation also poses serious risks, as generative AI often relies on large-scale use of copyrighted works, potentially enabling the extraction of creative labour without consent or compensation. The challenge, therefore, lies in achieving regulatory balance. Effective frameworks must allow AI technologies to grow while ensuring that creators retain meaningful protection over their works. Transparency measures, licensing mechanisms, and accountability tools can help maintain this balance. Ultimately, sustainable AI development requires governance models that support technological progress while protecting the creative labour from being exploited by artificial intelligence systems.

TOWARDS AN EQUITABLE GLOBAL IP ORDER: REFORMING WIPO AND TRIPS TO ADVANCE INCLUSIVE INNOVATION AND TECHNOLOGY ACCESS

Swapnil Rajendra Choudhari*

ABSTRACT

The worldwide intellectual property (IP) environment is very much like a turning point, influenced by such factors as rapid technological change, geopolitical division, and the growing differences in access to innovation. In fact, the multilateral frameworks under the World Intellectual Property Organization (WIPO) and the Agreement on Trade, Related Aspects of Intellectual Property Rights (TRIPS) were intended to standardize international relations. However, the result of their implementation has been far from social justice in terms of nations diversity. Poor and middle, income countries still have obstacles in getting, using, and commercializing knowledge, based assets. This research looks at reform from three different angles. Firstly, the paper investigates the repositioning of WIPO from being an essentially administrative treaty, centered organization to becoming a proactive development, focused facilitator which would be capable of ensuring legal harmonization, dispute resolution, and innovation financing in the case of underrepresented economies. Secondly, the paper deals with changes in TRIPS, especially in the interpretative flexibility of the different facets of the issues like compulsory licensing, parallel importation and, least, developed, country exemptions. The article argues that top, level international intellectual property (IP) management should be less uniform and more adjusted to the differing situations of the parties involved, with development cooperation and an inclusive digital infrastructure as two factors that would enable a fair participation of all in the knowledge economy. It will be definitely required a reform of both WIPO and TRIPS as a first step towards a global system operating on the basis of mutual trust which would not only take into account the rights of the owners but also the

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needs of the society and would facilitate the emergence of new technologies accessible to everyone.

KEYWORDS: Global IP Order, WIPO Reform, TRIPS Flexibility, Inclusive Innovation, Technology Access.

INTRODUCTION

Given the essential role of knowledge in today's economy, Intellectual Property Rights (IPRs) have become a key component of the global knowledge economy. By bestowing upon authors and inventors the legal rights to their works and inventions, IPRs aim to serve as an engine for technological progress and economic development through incentivizing innovation. Intellectual property has become a crucial tool in determining worldwide competitiveness and development paths, in the context of an ever, more knowledge, based economy, digital technologies, and international trade. The main reason behind international intellectual property governance changes over time is the need for regulation that is consistent with globalization. Cooperation among states based on the Paris and Berne Conventions first, established the principle of international intellectual property protection, whereas the later agreements provided for more detailed and binding standards.

The formation of the World Intellectual Property Organization (WIPO) signaled the commitment of the international community to organizing global IP regulation and collaboration. Later on, under the World Trade Organization, the TRIPS Agreement introduced standardised IP protection requirements among its members. On the other hand, the desire for harmonization has led to equity and inclusivity concerns. Standardizing IP rules may overlook the differences in levels of economic development, technological capabilities, and social welfare needs. Developing and least developed nations are still struggling hard to get access to essential technologies, medicines, and knowledge resources. Thus, the necessity of an IP system that encourages inclusive innovation and fair six access to technology has been highlighted. In this context, this study discusses the existing issues of the global IP system and looks at reforms within WIPO and TRIPS that would help make the global intellectual property system more balanced and fair.[246] On a worldwide scale, the intellectual property system suffers from a fundamental imbalance that results from imposing the same IP standards on economies at very different levels of development. While highly advanced societies get

[246] World Intellectual Property Organization. (2004). Intellectual property handbook: policy, law and use. Geneva: WIPO

benefits from trademarking their high, tech inventions, the developing and least, developed countries (LDCs) are turned away from getting hold of new technologies, medicines, and knowledge resources that are essential for their welfare. The fact is that the World Intellectual Property Organization (WIPO) and the TRIPS Agreement, which on paper are intended to foster innovation and development, have rarely been able to deliver their promises in practice. Thus, there is a disconnect between the law and the actual situation on the ground, which is a cause of concern not only for fairness and inclusiveness but also for the developmental legitimacy of the global IP system.[247]

REVIEW OF LITERATURE

THEORETICAL DISCUSSIONS ON GLOBAL INTELLECTUAL PROPERTY GOVERNANCE

The key issue that theoretical debates are grappling with is the balance of global intellectual property governance between innovation incentives and access to knowledge. On the one hand, mainstream economic theories support strong IP rights on the grounds that exclusivity rights are necessary to prompt investment in research and development. On the other hand, critical theorists point out that too stringent IP protection is detrimental as it hampers knowledge sharing, increases prices and stifles local innovation, especially in developing countries. From the perspective of public interest and human rights, IP rights are considered as social tools that should be harmonized with the rights to health, education, and access to science, thereby underlining the aspects of proportionality and flexibility.[248]

CRITICAL PERSPECTIVES ON TRIPS

One of the main themes in the academic literature criticism of TRIPS is that it mandates the adoption of uniform IP standards which have a negative impact on access to medicines and essential technologies. The authors note that, despite the fact that TRIPS provides for compulsory licensing and parallel importation, the use of these options is effectively undermined by the factors of political pressure, complicated procedures, and lack of funds, thus compromising the objectives of the public welfare.

WIPO AND THE DEVELOPMENT AGENDA

[247] Masus, K. E. (2000). Intellectual property rights in the global economy. Washington, DC: Institute for International Economics.
[248] Gervais, D. (2012). International intellectual property: A handbook of contempary research. Cheltenham,UK: Edward Elgar.

Research on the World Intellectual Property Organization (WIPO) recognizes the Development Agenda as a change in direction at the level of norms but points out that its implementation has been very limited. The major problems still are weak mechanisms for the transfer of technology and lack of enough capacity, building initiatives.[249]

EMERGING SCHOLARLY TRENDS

New scholarly trends call for differentiated IP standards and innovation models that are both inclusive and sustainable, focusing on equity, digital access, and development, oriented global IP cooperation.

EVOLUTION OF THE GLOBAL IP REGIME

HISTORICAL DEVELOPMENT OF INTERNATIONAL IP TREATIES

The worldwide intellectual property system is an outcome of a series of steps taken as a result of increasing cross, border trade, technological advancements, and the need for legal certainty in the protection of creative and inventive works. The first attempts at international cooperation date back to the late 19th century when the Paris Convention for the Protection of Industrial Property (1883), and the Berne Convention for the Protection of Literary and Artistic Works (1886) were adopted. These treaties laid down basic principles like national treatment and independence of rights, so that creators could receive protection throughout the member states without the necessity of having uniform domestic laws. Although these conventions encouraged cooperation, large regulatory autonomy was still retained by states, especially in the aspect of modifying IP laws to fit their domestic socio, economic conditions.

ESTABLISHMENT AND FUNCTIONS OF WIPO

International governance of intellectual property was unified through the creation of the World Intellectual Property Organization (WIPO) in 1967, which later became a specialized agency of the United Nations. WIPO's initial purpose was to be the international intellectual property treaty administrator and to foster cooperation among states in the protection of intellectual property worldwide. It is responsible for global registration systems, technical assistance provision, capacity, building facilitation, and policy development support among others. After the adoption of the WIPO Development Agenda, the scope of the organization grew from mere administrative coordination to including development, oriented objectives. Nevertheless,

[249] World Intellectual Property Organization. (2010). WIPO development agenda, Geneva: WIPO.

researchers maintain that WIPO still mainly focuses on IP protection and harmonization, rather than on real development results.[250]

TRIPS Agreement under the WTO Framework

The Agreement on Trade, Related Aspects of Intellectual Property Rights (TRIPS) under the World Trade Organization framework marked a major overhaul of the global IP governance system in 1995. While previous treaties were more about "nagging on the side, " TRIPS set down binding minimum standards of IP protection that all WTO members had to follow and linked the fulfilling of these standards with international trade commitments. Integration increased the power of enforcement and thus brought the possibilities of regulatory adjustments for developing countries sharply down. The TRIPS agreement indeed provides a number of flexibilities such as compulsory licensing, parallel importation, and transition periods for least, developed countries; however, their real exercise has been limited by political pressure and economic considerations. Therefore, TRIPS is still the key issue of disputes over how to balance trade interests, innovation, and fair development in the global IP regime.

Challenges to Inclusive Innovation

Technological and Digital Divide

A considerable challenge to inclusive innovation is the enduring technological and digital disparities between the developed and developing countries. The advanced nations have a solid research infrastructure, highly qualified human resources, and access to digital technologies, which enable them to effectively generate and commercialize intellectual property. On the other hand, a lot of developing and least, developed countries do not have sufficient digital infrastructure, research funding, and technical know, how. This gap in development hampers their ability to fully engage in the global knowledge economy and to enjoy the benefits of the intellectual property systems which favor formal innovation outputs over local and incremental innovation.[251]

Access to Medicines and Public Health Technologies

Making affordable medicines and public health technologies available to everyone is still an issue of great concern in the global intellectual property framework. Pharmaceutical patent protection usually results in high prices, thereby making the essential medicines out of the

[250] World Trade Organization. (1995). Agreement on Trade-Related Aspect of Intellectual Property Rights. Marrakash: WTO

[251] Stiglitz, J. E. (2008). Economic of intellectual property rights. Duke Law Journal, 57(6), 1693–1724.

reach of the majority of the population in developing countries. Public health emergencies, such as pandemics, have revealed the inadequacies of the current IP system in meeting the global needs in a timely manner. Even though there are legal provisions to handle such situations, the structural and procedural hurdles are still causing delays in the access to the technologies which save lives, thus going against the concept of inclusive innovation.

WEAK TECHNOLOGY TRANSFER MECHANISMS

Successful technology transfer is a key driver for innovation and domestic technological capacity building in developing countries. Yet, international mechanisms in this area have largely been ineffective. There are usually no legally binding and verifiable standards for the technology transfer obligations. Although the World Intellectual Property Organization (WIPO) has been recognized as playing a role in technology transfer and capacity, building, scholars point out that such programs are limited in both scale and impact. Thus, developing countries are still technologically dependent on imports without having the necessary skills for innovation that is sustainable.[252]

POLITICAL AND ECONOMIC PRESSURES ON DEVELOPING STATES

Political and economic pressures are additional reasons why developing countries are less able to take advantage of the policy space available to them under the global IP regime. States are often discouraged from implementing measures that weaken IP protection through trade negotiations, bilateral agreements, and diplomatic influence. The fear of trade sanctions, divestment, or loss of reputation causes regulatory authorities to be overly cautious, even when public interest factors demand intervention. Such pressures not only perpetuate inequalities but also limit the sovereign power of developing states to create IP policies that are in line with the national development priorities and inclusive innovation goals of their countries.[253]

REFORMING WIPO FOR INCLUSIVE GROWTH

RESHAPING WIPO AS A DEVELOPMENT, FOCUSED ORGANIZATION

If the global intellectual property system is to facilitate inclusive growth, the World Intellectual Property Organization (WIPO) needs to be changed from a mainly administrative and treaty, focused body into a development, oriented institution. Although WIPO has been chiefly

[252] Chang, H. J. (2001). Intellectual property rights and economic development. Journal of Human Development, 2(2), 287–309

[253] Boyle, J. (2008). The public domain: Enclosing the commons of the mind. New Haven, CT: Yale University Press.

focused on the harmonization and protection of IP rights, the emergence of new global challenges calls for a greater emphasis on fairness, access, and the innovation capability of developing and least, developed countries. Putting development at the center of WIPO's strategy would mean incorporating socio, economic goals into IP policymaking and making sure that IP protection is not used as a tool to prevent public interest or developmental priorities.

ENHANCING CAPACITY, BUILDING AND TECHNICAL ASSISTANCE

Capacity, building and technical assistance are vital to help developing countries in harnessing IP systems as a means for innovation and growth. WIPO's current programs in legislative aid, institutional strengthening, and IP awareness should not only be augmented but also customized to local realities. Priority should be given to elevating national research capacities, providing support to small and medium enterprises, and facilitating access to digital IP infrastructure. When technical assistance is in line with the overall national development plans, WIPO will be assisting in the transformation of IP from just a legal requirement to a viable instrument for inclusive economic development.[254]

EFFECTIVE DISPUTE RESOLUTION MECHANISMS

WIPO should give more emphasis on enhancing alternative dispute resolution mechanisms that are low in cost, easy to get, and cater to the requirements of developing countries. Besides that, enabling innovation financing through public, private partnerships, patent pools, and development, oriented funding initiatives can help in grassroots innovation as well as technology commercialization. All these steps taken together will lead to having a global IP system that is more balanced and inclusive.

ROLE OF PUBLIC SECTOR INNOVATION AND GOVERNMENT-FUNDED RESEARCH

Innovative public, sector services and government, sponsored research activities are instrumental in fostering inclusive innovation and providing tough access to technology, notably in developing and least, developed nations. A major part of scientific research and technological advances, especially in sectors like healthcare, pharmaceuticals, agriculture, climate technology, and digital infrastructure, is funded through public money. Since taxpayers

[254] United Nations Committee on Economic, Social and Cultural Rights. (2006). General Comment No. 17. Geneva: UN.

are the ones who eventually finance such research, there is a question of whether it is fair that the resulting intellectual property should be allowed to be monopolized by private firms.[255]

In several instances, publicly, funded inventions are patented and privately licensed to corporate entities that thereafter commercialize the products at exorbitant prices. This kind of behaviour is very likely to be the main cause of the unaffordability of medicines, educational materials, and other necessary technologies in developing countries. Moreover, the use of scarce government funds to finance such research should be channelled toward meeting the real needs of the people rather than promoting the interests of a few commercial companies. From the perspective of inclusive innovation, publicly funded inventions should be treated as public goods or, at the very least, be subject to access-oriented intellectual property policies. International institutions such as World Intellectual Property Organization have emphasized the need to align IP protection with development objectives. However, practical mechanisms ensuring that public sector innovations remain accessible are still limited. The prevailing global IP framework, influenced by the World Trade Organization and the TRIPS Agreement, largely prioritizes private ownership and exclusivity, even where public funding is involved.

A potential solution to this problem could be the spreading of open licensing types of publicly financed research and development. An open license is a license that enables multiple users to access, use, and build innovations without the risk of challenging patent barriers. Such models promote collaboration, minimize the repetition of research works, and speed up the spread of technology. For example, during global health emergencies, open or non, exclusive licenses can greatly increase the supply of medicines and medical technologies that save lives.

Moreover, governments can take the lead by making research grants dependent on IP terms that are friendly to access. This covers the issuance of mandatory non, exclusive licenses, the imposition of obligations for the transfer of technology, and the incorporation of affordability clauses in public, private partnerships. Thus, governments, through their innovation funding, can meet the needs of the society and work towards the goals of sustainable development.

Last but not least, it is important to note that access, oriented IP policies supporting the public sector's innovative potential play a crucial role in establishing a just and inclusive global intellectual property landscape. Making sure that research funded by the government is doing

[255] Correa, C. M. (2000). Intellectual property rights, the WTO and developing countries. London: Zed Books.

the public good is not only a matter of social justice but it also helps to legitimize the global IP system that is becoming more and more interconnected and knowledge, based.[256]

TRIPS-PLUS AGREEMENTS AND THEIR IMPACT ON DEVELOPING COUNTRIES

TRIPS, Plus agreements are commonly understood as bilateral or regional trade and investment agreements that raise the bar for intellectual property (IP) protection beyond what is mandated by the TRIPS Agreement of the World Trade Organization. If we look at the history of TRIPS, this Agreement was primarily aimed at being a multilateral compromise that included certain flexibilities for developing and least, developed countries; hence TRIPS, Plus provisions religiously disregard this policy space. Generally, these agreements are negotiated between developed and developing countries, where imbalances in the bargaining power frequently result in weaker economies being saddled with stricter IP obligations.

TRIPS, Plus provisions, however, go beyond the mere extension of patent terms, data exclusivity for pharmaceuticals, restrictions on compulsory licensing, limitations on parallel importation, and enhancement of enforcement mechanisms. Apart from being more demanding than the TRIPS Agreement, dichas provisions often disallow the developing countries from effectively utilizing the TRIPS flexibilities which were indeed explicitly provided for the purpose of addressing public interest concerns. Therefore, the outcome is that such countries have to bear high costs when they require access to medicines, agricultural technologies, and digital innovations.[257]

Among the chief repercussions of TRIPS, Plus commitments is their effect on public health. Prolonging monopoly rights and thus postponing the availability of generic medicine, these deals can price essential drugs out of reach for major portions of the population in low, and middle, income nations. This is at odds with the aims of the Doha Declaration on TRIPS and Public Health, which recognized the right of WTO members to safeguard public health and to make medicines accessible to everyone. In reality, however, TRIPS, Plus commitments tend to override these multilateral protections through enforceable bilateral agreements.

In addition, TRIPS, Plus agreements restrict the freedom of domestic regulations and deteriorate national innovation strategies. Developing countries find themselves forced to

[256] Bott, F. M. (2002). The TRIPS AGREEMENT, access to medicines and the WTO Doha Ministerial Conference. Journal of International Economic Law, 5(1), 5–30.
[257] WTO. (2001). Doha Declaration on the TRIPS Agreement and Public Health. Doha: WTO.

implement IP laws copying those of wealthy countries, even though they do not have a similar level of technological capability, industrial infrastructure, or innovation ecosystems. This universal solution thus runs the risk of deepening the dependence on foreign technology and discouraging local, small, scale, and adaptive innovation. Under such stringent regimes, small and medium enterprises, public research institutions, and informal innovators are among the most disadvantaged.

From a global IP governance perspective, the proliferation of TRIPS-Plus agreements fragments the multilateral system and shifts norm-setting away from inclusive forums such as the WTO and the World Intellectual Property Organization. This trend raises serious concerns regarding equity, transparency, and democratic participation in international law-making. To advance inclusive innovation, it is essential to resist the normalization of TRIPS-Plus standards and reaffirm the legitimacy of TRIPS flexibilities as integral components of a balanced and development-oriented global IP order.

RE- IMAGINING TRIPS FLEXIBILITIES

COMPULSORY LICENSING AS A PUBLIC POLICY TOOL

Compulsory licensing is one of the major flexibilities under the TRIPS Agreement, which aims at a proper balance between the protection of patent rights and the achievement of public interest objectives. It is a measure whereby a government can grant a third party the right to use a patented invention without the permission of the patent holder, especially where public health emergencies or national necessities are involved. Nonetheless, at times, compulsory licensing has been considered more as a measure of last resort rather than a legitimate policy instrument. A re, imagination of this flexibility entails permitting its regular use at the domestic legislation level, and also making the procedural requirements less stringent. If compulsory licensing is viewed as a legitimate method of making access to essential technologies easier, it can be a powerful means of enabling governments to work towards the welfare of their people even at the risk of IP system compromise.[258]

PARALLEL IMPORTATION AND MARKET ACCESS

One of the ways parallel importation contributes to market access is by allowing the import of patented products, which have been sold at lower prices, from other countries where these

[258] Reichaman, J. H. (2009). Intellectual property in the twenty-first century. Houston Law Review, 46(4), 977–1023.

products are sold at a cheaper rate. This makes the products more affordable locally. It is acknowledged that TRIPS makes a provision for member states to decide on their own exhaustion regimes, nevertheless, due to trade and diplomatic pressures, most countries are reluctant to adopt international exhaustion. There are quite a few articles, research papers, and other materials written by scholars, which advocate for the more widespread use of parallel importation as a means that helps to a great extent in the correction of price distortions and thereby giving patients and others a better access to medicines and technologies. It could be said that if this mechanism is allowed to be more widely used, it will be a point of reference in ensuring that prices become more competitive and the control of one's monopoly over a necessity will no longer be possible.[259]

EXEMPTIONS AND TRANSITION PERIODS FOR LEAST, DEVELOPED COUNTRIES

Across the board, the least, developed countries (LDCs) have been recognized as those which are limited in terms of technology, institutional capacity, and others. Hence, the international community, under TRIPS, kindly allowed them longer transition periods during which they do not have to comply fully with the obligations of the IP. On the other hand, apart from the above tangible benefits, it has been the view of the majority of the researchers that such exemptions only help LDCs to a limited extent, and also, LDCs do not get enough support from these exemptions. It is quite different to talk about the new reform of TRIPS flexibilities without the first step of merely stretching out transition periods, and on top of that, you are suggesting that the extension be supported by technical assistance, capacity, building, and technology transfer. These are the kinds of things that LDCs could be expected to carry through with their development goals when participating in the global IP system.[260]

MOVING TOWARDS A DIFFERENTIATED AND EQUITABLE GLOBAL IP ORDER

A differentiated and equitable global intellectual property order entails going beyond rigid standardization to context, sensitive IP norms. Given the varying economic, technological, and social situations of countries, there should be flexibility in crafting IP systems in harmony with national development objectives. Developing and least, developed countries are often the ones to suffer when standardization is implemented without consideration of local capacities, as their policy space is severely curtailed and the domestically, generated innovations are even

[259] Moon, S., & Waage, J. (2013). Innovation and access to medicines for neglected populations. Bulletin of the World Health Organization, 91(6), 398–404.
[260] United Nations Conference on Trade and Development. (2011). Using intellectual property rights to stimulate local innovation. Geneva: UNCTAD.

more hampered. A context, sensitive approach would give states the freedom to adjust IP protection so that it can be a facilitator of technological learning, industrial growth, and social welfare.[261]

One of the key elements of achieving equity within the global IP system is the balancing of IP protection with the public interest. Intellectual property rights, on one hand, are essential tools for spurring innovation; however, if they are overly protective or rigid, they run the risk of denying the public access to essentials like medicines, educational resources, and digital technologies. Therefore, an equitable framework must acknowledge IP not as an end in itself but rather as a means to an end. The inclusion of public interest safeguards, proportionality principles, and human rights considerations into the framework ensures that the societal benefits of innovation are widespread and that the gap in equality is not further widened.

Digital infrastructure along with open innovation are great enablers in breaking walls and facilitating access to knowledge and technology for all the people. Better digital connectivity makes it possible for more people to become part of the innovation process, especially small businesses, universities and inventors in poorer nations. Open innovation schemes like co, operative research labs, patent pools, and voluntary licensing, act as complements to the traditional IP systems by opening up channels for sharing of knowledge and lessening the entry barriers. They can hardly be substituted as the most effective method in solving the problems of the world which require collective responses.[262]

It is highly important to differentiate between and keep the IP global cooperation inclusive if we are to successfully continue with it. The World Intellectual Property Organization (WIPO) as a multilateral institution should focus its efforts in development cooperation, transparency and inclusive decision, making. By working together, countries can lessen the influence of the more powerful ones and create a global IP system that is based on innovation, fairness and common development.

RECOMMENDATIONS

Institutional Reforms within the WIPO, The World Intellectual Property Organization (WIPO) should be broadly seen as a development, oriented entity and not just an administrative body.

[261] Castells, M. (2010). The rise of the network society (2nd ed.). Oxford: Wiley-Blackwell.
[262] Drahos, P. (2007). Expanding intellectual property's empire. Oxford Journal of Legal Studies, 27(2), 277-305.

Development aspects should be a major focus in all WIPO works and not merely confined to the Development Agenda., There should be a guarantee for a significant share of developing and least, developed countries in the formation of policies and decision, making. Normative Reinterpretation of TRIPS Provisions, TRIPS flexibilities like compulsory licensing, parallel importation, and transition periods should be recognized once again as a legitimate and vital part of the Agreement, To define the details and legitimate usage of these flexibilities, various vocal interpretative guidelines should be made available. Increased International Cooperation and Enforcement of Development Obligations, It is imperative that developed countries genuinely carry out their commitments connected to the transfer of technology, provision of technical assistance, and capacity, building., Compliance with development, related commitments should be ensured through the introduction of more robust monitoring and accountability mechanisms.[263] Integration of Human Rights and Sustainability Principles, The governance of global IP should be consistent with human rights obligations, especially concerning the rights to health, education, and access to science.

CONCLUSION

This paper has critically analyzed the structural flaws of the global intellectual property regime and the consequent difficulties for inclusive innovation and fair access to technology. It has been revealed by the study of WIPO's institutional role and the TRIPS Agreement's normative framework that the imposition of uniform IP standards by the two agreements is usually incompatible with the diverse developmental realities of states. In fact, while both systems have a formal recognition of development concerns and public interest safeguards, their implementation on the ground has been uneven, and limited. It is confirmed here that a substantial overhaul of global IP governance is indispensable if we truly mean to fulfill the laws ambitions. For instance, transforming WIPO into a truly development, focused institution and viewing TRIPS flexibilities as perfectly legitimate instruments of national policies will restore the equilibrium between innovation incentives and societal needs. The transition to a differentiated, context, sensitive IP framework is not simply an option but rather a requirement for the global system to be fair and legitimate.[264] It is said that the future of inclusive innovation hinges on various factors such as increased international collaboration, a strong digital infrastructure, and open innovation models that lead to the sharing of knowledge. If a global

[263] May, C. (2014). The globsl Political Economy of intellectual Property law (2nd ed.). London: Routledge.
[264] Hesbrough, H. (2006). Open Innovation : The New Imperative for creating and profiting from technology. Boston, MA: Harvard Buisness School Press

IP order is fair that is, if it harmonizes human rights, sustainability, and development can become a powerful agent of change by guaranteeing that innovation and tenchnology are for the benefit of all mankind.[265]



[265] Sen, A. (1999). Developement as freedom. New Delhi: Oxford University Press.

VISUAL AND PHONETIC SIMILARITY TESTS IN INDIAN TRADEMARK LAW: BARRIERS TO INCLUSIVE INNOVATION AND ACCESS TO INTELLECTUAL PROPERTY PROTECTION

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ABSTRACT

Trademarks are extremely important because they allow businesses to differentiate their products and services from those of their competitors, build a reputation in the market, and meaningfully participate in economies under competitive conditions. Under the Trade Marks Act of 1999, India has a primary system for reducing consumer confusion and protecting fair competition. This method involves the evaluation of the visual and phonetic similarity of trademarks on the market. The judicial implementation of these likeness criteria has frequently been distinguished by complexity, subjectivity, and inconsistency, despite the fact that these tests have successfully established their doctrinal foundations. The purpose of this paper is to suggest that the unpredictability that exists within trademark similarity jurisprudence acts as an unintentional barrier to inclusive innovation. This is especially true for micro, small, and medium companies (MSMEs), startups, and first-time trademark applicants. The purpose of this paper is to investigate trademark similarity not just as a doctrinal exercise, but also as an accessibility issue within the intellectual property system. This investigation is situated within the larger discourse of intellectual property and innovation for inclusive growth in a period of transformation. It does this by doing a selected examination of Indian judicial decisions, which reveals how principles such as imperfect recollection, phonetic approximation, overall structural similarity, and consumer perception are applied in a manner that is inconsistent between cases. The absence of uniformity in this area results in uncertainty regarding the outcomes of registration and enforcement, which in turn increases the legal risk and compliance costs for innovators who have limited resources. In place of providing a

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comprehensive doctrinal mapping of visual and phonetic similarity tests, the paper takes a policy-oriented and socio-legal approach to the subject matter. It highlights how similarity rules that are excessively difficult or unexpected can discourage formal brand registration, impede market entrance, and undercut broader government policies that are meant at supporting growth that is driven by startups and micro, small, and medium-sized enterprises (MSME companies). This paper provides a more in-depth analysis of the institutional role that courts and trademark authority play as gatekeepers of access to intellectual property protection.

KEYWORDS: Indian Trademark Law, Visual Similarity, Phonetic Similarity, Trademark Infringement, Inclusive Innovation.

INTRODUCTION

The capacity of businesses to generate, safeguard, and commercialize intangible assets is becoming an increasingly important factor in determining the rate of economic growth that is generated by innovation. For businesses operating in modern information economies, intangible assets frequently constitute a sizeable share of the total enterprise value, particularly in marketplaces that are oriented toward consumers. When it comes to the many different types of intellectual property, trademarks hold a unique place since they are emblems of origin, quality, and goodwill. Patents and industrial designs are two types of intellectual property that safeguard technological innovation. Trademarks, on the other hand, protect the reputational capital that enables firms to engage with customers and differentiate themselves in the market.[266]

Intellectual property in the form of trademarks is frequently the most valuable and easily accessible type of intellectual property for micro, small, and medium companies (MSMEs) and startups. Small enterprises are able to advance beyond informal trading and acquire a recognized identity through the process of branding, which is frequently the first step towards market formalization.[267] In this perspective, trademark protection serves not just as a private proprietary right, but also as an institutional tool that supports market participation, customer trust, and economic inclusion all at the same time.

In India, the Trade Marks Act, 1999 is the law that governs trademark protection. This act was created with the intention of achieving a balance between the competing interests of trademark proprietors, customers, and rivals. The purpose of the Act is to promote fair competition while simultaneously

[266] Bently, Sherman, Gangjee & Johnson, Intellectual Property Law (5th edn, OUP 2018).
[267] World Intellectual Property Organization, SMEs and Intellectual Property: Leveraging Intangible Assets for Growth (2019).

preventing consumer confusion and fraud. The evaluation of the degree of similarity between competing marks, particularly with regard to visual and phonetic similarity, is an essential component of this framework. These likeness tests are the foundation upon which trademark infringement, passing off, and opposition proceedings are built.[268] The judgment of whether or not a mark is enforceable, registrable, or susceptible to dispute is directly influenced by the degree of resemblance between the marks.

A complex set of guidelines concerning the evaluation of visual and phonetic resemblance has been developed by Indian courts over the course of many years. The doctrine of imperfect recollection, the requirement that marks be compared as a whole rather than dissected into their component parts, the relevance of phonetic resemblance in a society that speaks multiple languages, and the importance of contextual factors such as the nature of goods, the class of consumers, and the surrounding trade circumstances are some examples of these.[269] It is the intention of these principles to represent the behaviour of consumers in the actual world and to guarantee that trademark protection will continue to be effective.

However, despite the fact that these principles are doctrinally valid, the execution of them has frequently included a significant amount of judges exercising their discretion. The concept that similarity analysis is more of a question of overall impression than a rigorous formula has been underlined by the courts on numerous occasions.[270] As a consequence of this, the outcomes of trademark similarity challenges can be unpredictable, with courts reaching different decisions even in cases that involve factual circumstances that are broadly equivalent to one another. This unpredictability is not only a matter of academic concern; rather, it has specific repercussions for those who are attempting to gain access to trademark protection resources.

There is a possibility that the uncertainty in similarity jurisprudence could be considered an acceptable cost of enforcement for huge firms that have substantial legal and financial resources. These types of organizations are better able to carry out exhaustive clearance searches, retain the services of specialized legal counsel, and absorb the costs of litigation. On the other hand, doctrinal uncertainty can be a significant barrier to formal brand protection for micro, small, and medium-sized enterprises (MSMEs), startups, and first-time applicants for trademarks.[271] It is possible that smaller businesses will be dissuaded from registering trademarks or asserting their rights due to the high cost of traversing complex similarity rules, as well as the possibility of bad legal decisions.

It is possible that validly adopted marks would be abandoned in extreme circumstances due to the risk of being subjected to infringement action or opposition proceedings. This issue of over-deterrence is

[268] Corn Products Refining Co v Shangrila Food Products Ltd, AIR 1960 SC 142.
[269] Amritdhara Pharmacy v Satya Deo Gupta, AIR 1963 SC 449; Parle Products (P) Ltd v JP & Co, (1972) 1 SCC 618.
[270] F Hoffmann-La Roche & Co Ltd v Geoffrey Manners & Co Pvt Ltd, AIR 1970 SC 2062.
[271] OECD, SMEs, Entrepreneurship and Innovation (OECD Publishing 2010).

especially troublesome in economies that are driven by innovation because it inhibits experimentation, the development of brands, and market entry.[272] In the event that small businesses resort to informal branding tactics or completely shun distinguishing marks, the overarching goals of trademark law, which include consumer clarity, market openness, and fair competition, are weakened.

When considered in the context of India's more comprehensive innovation and economic plan, these challenges take on a magnified level of significance. Start-up India, Make in India, and a variety of other micro, small, and medium-sized enterprise (MSME) support schemes are examples of government efforts that place a focus on entrepreneurship, innovation, and formalization as essential drivers of equitable economic development.[273] In the context of these activities, the protection of intellectual property is frequently promoted as a tool that might facilitate progress. However, if an intellectual property system is difficult to access, uncertain, or too complicated, it runs the risk of excluding the very people that it intends to empower.

Despite this, trademark similarity jurisprudence in India has primarily been examined from a doctrinal or consumer-protection standpoint. While there is extensive research on the principles determining visual and phonetic similarity, there has been relatively little discussion of how these principles affect access to intellectual property protection and inclusive innovation.[274] This paper aims to close that gap by recasting visual and phonetic similarity analysis as an accessibility issue within the intellectual property framework.

Despite the fact that visual and phonetic similarity tests are necessary for trademark protection, the current application of these tests frequently acts as an unintentional barrier to inclusive innovation. This is the primary point that will be presented in this article. The legitimacy of similarity tests in and of themselves is not called into question in this article. Instead, it examines the manner in which these tests are used as well as the institutional repercussions that result from doctrinal contradiction. In this article, trademark jurisprudence is aligned with the broader goals of inclusive growth in a period of transformation. This is accomplished by focusing on access, predictability, and institutional accountability.

In terms of methodology, the paper takes a qualitative approach that focuses on doctrinal policy formation. In order to highlight patterns of judicial reasoning, it conducts a selected study of leading decisions made by the Supreme Court and the High Court. This is done rather than attempting to generate an exhaustive mapping of all instances that are extremely similar. This chosen approach to methodology was made on purpose. This makes it possible for the article to keep its focus on policy, to avoid duplicating thorough doctrinal analysis that has been done elsewhere, and to concentrate on structural trends and accessibility problems.[275]

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[272] Lemley, 'The Modern Lanham Act and the Death of Common Sense' (1999) 108 Yale LJ 1687.
[273] DPIIT, Government of India, Start-up India Action Plan.
[274] Venkateswaran, The Law of Trade Marks and Passing Off (6th edn, LexisNexis).
[275] Cappelletti & Garth, Access to Justice (1978).

The paper is organized as follows. The next part investigates the theoretical relationship between trademark law and inclusive innovation, contextualizing similarity analysis within an access-to-justice framework. This is followed by an examination of the statutory and legal bases for visual and phonetic similarity testing in India. The subsequent parts investigate judicial inconsistency and its impact on MSMEs and first-time applicants, before delving into the institutional function of trademark agencies and courts as access gatekeepers. The article concludes by making reform-oriented recommendations to improve predictability, accessibility, and inclusion in trademark adjudication.

TRADEMARK LAW AND INCLUSIVE INNOVATION

As economies strive to strike a balance between growth and equity, the idea of inclusive innovation has been increasingly prominent in the modern policy discourse around the world. When it comes to the processes of value creation and market competition, inclusive innovation places an emphasis on the engagement of a wide range of economic actors, such as micro, small, and medium-sized enterprises (MSMEs), informal enterprises, rural entrepreneurs, and first-generation innovators. Legal protections for intellectual property, which have historically been justified as a vehicle for rewarding creativity and investment, are increasingly being reviewed through the lens of this more comprehensive developmental perspective.[276] IP system design and administration can either support or impede equitable participation, depending on its accessibility, predictability, and institutional reactivity.

Within this context, trademarks hold a distinctive role. Unlike patents, which frequently involve significant technological expertise and investment, trademarks are very easy to obtain and are directly related to market presence. For many small businesses, a trademark is their first formal interaction with the intellectual property system.[277] The availability of trademark protection thus has a direct impact on whether smaller actors can formalize their enterprises, expand operations, and compete beyond local markets.

Legal accessibility, in terms of access to justice, goes beyond simply having rights on paper. It includes clarity of legal criteria, affordability of procedures, institutional support, and predictability of outcomes.[278] Where legal norms are complex or ambiguous, formal access may exist but not be useful. Trademark law exhibits this tension. While the Trade Marks Act of 1999 makes no distinction between applicants based on size or resources, the interpretation of essential concepts; particularly similarity; can result in unequal practical outcomes.

Within the realm of trademark law, something that serves as a gatekeeping mechanism is similarity analysis. Enrollment in the register, the extent of protection, and the likelihood of being subject to

[276] OECD, Innovation and Inclusive Growth (OECD Publishing 2015).
[277] World Intellectual Property Organization, SMEs and Intellectual Property: Leveraging Intangible Assets for Growth (2019).
[278] Cappelletti & Garth, Access to Justice (Sijthoff & Noordhoff 1978).

enforcement action are all determined by it. When it comes to major organizations, it is frequently possible to navigate similarity standards through the consultation of professionals and through litigation. However, uncertainty regarding similarity evaluation might cause a disproportionate risk for micro, small, and medium-sized enterprises (MSMEs) and startups. In situations where legal standards are believed to be uncertain or enforcement is perceived to be harsh, empirical research have shown that smaller businesses are more prone to shun formal intellectual property systems.[279] The inclusive potential of trademark protection is undermined when such avoidance occurs with trademarks.

The structural and socio-economic elements that are present in the Indian setting cause these problems to become even more pronounced. The landscape of entrepreneurship in India is distinguished by the presence of a major informal sector, regional branding techniques, and linguistic diversity. Words that are often used in everyday speech, phonetic spellings, and statements that have cultural significance are regularly used in trademarks.[280] Despite the fact that such procedures promote the diversity of the market, they also raise the probability that different marks will have phonetic similarities. It is possible that regional and grassroots innovators will be excluded from the competition if similarity requirements do not appropriately account for acceptable linguistic distinctions.

The adjudication of trademarks must therefore be attentive to context while staying consistent in principle in order to fulfil the requirements of inclusive innovation. The courts and the authorities in charge of trademarks play an important part in determining this equilibrium. They have the ability to affect not just individual conflicts but also broader views of accessibility and fairness inside the trademark system by the choices they make regarding interpretation. Whenever similarity rules are applied in an inconsistent manner, they have the potential to accidentally favor established companies that have the ability to enforce the standards while simultaneously disadvantage new entrants.

VISUAL AND PHONETIC SIMILARITY TESTS UNDER INDIAN TRADEMARK LAW

STATUTORY FRAMEWORK AND JUDICIAL DEVELOPMENT

It is not possible to find a specific definition of "visual similarity" or "phonetic similarity" under the Trade Marks Act of 1999. These ideas, on the other hand, have developed over time as a result of judicial interpretation, particularly in relation to Sections 9, 11, and 29 of the Act.[281] Because of this reliance on judicial evolution, courts have been able to transform similarity analysis to accommodate a wide range of factual circumstances. While this is going on, the lack of statutory direction has been a factor that has contributed to the volatility of doctrine.

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[279] OECD, SMEs, Entrepreneurship and Innovation (OECD Publishing 2010).
[280] Gangjee, Relocating the Law of Geographical Indications (CUP 2012).
[281] Trade Marks Act, 1999, ss. 9, 11, 29 (India).

The test of likeness must be considered from the standpoint of an average consumer with ordinary intelligence and imperfect recollection, according to the Indian courts, which have consistently found that this perspective is required.[282] This approach acknowledges the fact that customers may not engage in the process of meticulously comparing marks and may instead rely on broad impressions that are made using their memories. As a consequence of this, even slight variations in spelling, font, or design might not be enough to prevent confusion if the overall impression of the marks is comparable.

Compare marks as a whole rather than breaking them down into their component parts, which is another notion that has been around for a long time and is widely accepted.[283] This comprehensive approach aims to ensure that false distinctions are avoided while also reflecting the perceptions of consumers in the real world. With that being said, the application of this principle frequently depends on the discretion of the judiciary, particularly when determining whether aspects of a mark predominate the overall impression that it conveys.

PHONETIC SIMILARITIES IN A MULTILINGUAL MARKETPLACE

Because of the wide variety of languages spoken in India, the concept of phonetic similarity has taken on a particularly important role in the legal framework governing trademarks. It has been established by the courts that pronunciation can differ between locations and languages, and that phonetic similarity can cause confusion even in situations when the visual presentation is different at the same time.[284] In a number of historic rulings, phonetic similarity has been considered to be the deciding factor, particularly in situations involving fast-moving consumer goods, food items, and pharmaceutical medicines.

The importance placed on phonetic similarity facilitates the achievement of significant consumer protection goals. It is possible that phonetic similarity is more influential than visual similarity in markets where literacy levels vary and where purchasing decisions are frequently made verbally. The perception of phonetics, on the other hand, is essentially subjective. There are a number of factors that might influence how a mark is interpreted, including accent, language background, and regional pronunciation trends.[285] As a consequence of this, judicial evaluations of phonetic similarity might vary dramatically from one case to the next, even in situations where the markings appear to be equivalent in general.

This subjectivity creates unique obstacles for first-time trademark applicants. Predicting how a court or examiner would interpret phonetic similarities is challenging, especially in the absence of

[282] Amritdhara Pharmacy v Satya Deo Gupta, AIR 1963 SC 449.
[283] Parle Products (P) Ltd v JP & Co, (1972) 1 SCC 618.
[284] Cadila Health Care Ltd v Cadila Pharmaceuticals Ltd, (2001) 5 SCC 73.
[285] Venkateswaran, The Law of Trade Marks and Passing Off (6th edn, LexisNexis).

unambiguous standards. The consequent uncertainty raises compliance costs and hinders brand experimentation.

VISUAL SIMILARITY AND TRADE DRESS CONSIDERATIONS

The scope of visual similarity research include not just word marks but also logos, labels, color schemes, packaging, and general trade dress as well. In order to determine the likelihood of confusion, the courts have taken into consideration a variety of variables, including the layout, font style, color combination, and location of items.[286] In certain situations, despite linguistic similarities, visual dissimilarity has been enough to rule out infringement, especially when goods are offered to discriminating consumers or through specialised channels.

However, the lack of a defined ordering between visual and phonetic cues leads to inconsistencies. Depending on the factual matrix, courts may prioritise one aspect over another without providing consistent justification. This heterogeneity complicates the risk assessment process for trademark applicants and weakens predictability.

CONSUMER PERCEPTION AND MARKET CONTEXT

Indian courts have also highlighted the importance of market environment in similarity analysis. The type of the items, the class of consumers, the form of purchase, and the surrounding trade conditions are commonly discussed.[287] Items aimed at specialised or educated consumers may face a higher level of misunderstanding, whilst regular consumer items may be subject to more scrutiny.

The extent of judicial discretion is further expanded by context-sensitive analysis, notwithstanding the fact that it is doctrinally authorized. This layered approach adds another dimension of complexity when viewed from the standpoint of inclusion. In particular, when it comes to opposition or infringement actions, it may be difficult for micro, small, and medium-sized enterprises (MSMEs) and first-time applicants to anticipate how the courts will assess these aspects. The ambiguity that has arisen as a consequence of this underscores the importance of examining similarity tests through the lens of accessibility rather than speaking solely in terms of doctrine.

JUDICIAL INCONSISTENCY AND DOCTRINAL UNCERTAINTY IN SIMILARITY ANALYSIS

DIFFERENT JUDICIAL APPROACHES TO VISUAL AND PHONETIC SIMILARITY

The Indian courts have not developed a unified approach to the application of visual and phonetic similarity criteria, despite the fact that they have repeatedly articulated fundamental concepts. There is a significant amount of variety in the proportionate weight that is attributed to phonetic similarities,

[286] Colgate Palmolive Co v Anchor Health & Beauty Care Pvt Ltd, 2003 (27) PTC 478 (Del).
[287] Corn Products Refining Co v Shangrila Food Products Ltd, AIR 1960 SC 142.

visual appearance, and overall trade dress in judicial decisions. In a number of instances, phonetic similarity has been considered to be the determining factor, even in situations when the visual presentation was drastically different.[288] This approach has been defended by the courts by highlighting the fact that consumers rely more on pronunciation than spelling, particularly in marketplaces that are marked by language diversity and diverse levels of literacy.

On the other hand, other courts have placed a higher priority on visual dissimilarity and overall trade dress, finding that phonetic similarities alone is not sufficient to demonstrate the possibility of mistake.[289] In situations like these, the courts have relied on distinctions in packaging, color schemes, font styles, and get-up to come to the conclusion that consumers are not likely to be misled. Doctrinal fluidity is the outcome of the absence of a clearly established hierarchy between visual and phonetic variables. This leaves a significant amount of discretion to the authorities who are responsible for adjudicating cases.

Due to the fact that flexibility is a recognized characteristic of trademark adjudication, this divergence does not inherently present any problems. On the other hand, predictability is decreased when flexibility is not accompanied with reasoning that is based on principles. Applicants for trademarks are left in the dark regarding which aspects would be given priority in a particular instance, which makes clearance searches and strategic decision-making more difficult. Given this ambiguity, micro, small, and medium-sized enterprises (MSMEs) and first-time applicants face an increased legal risk.

SIMILAR FACTS, DIFFERENT OUTCOMES

The availability of cases that include factual matrices that are broadly comparable but that result in different decisions is a recurrent aspect of the Indian trademark jurisprudence. There have been instances in which the courts have arrived to differing decisions regarding the possibility of confusion, despite the fact that the items, target consumers, and market conditions are all comparable.[290] These kinds of results are rarely explained by specific distinctions, and they frequently appear to be based on different judge interpretations of customer behaviour.

Both predictability and consistency are crucial components of access to justice when seen from the standpoint of the rule of law's principles. In situations where there is a substantial amount of variation in the outcomes without any obvious justification, the precedential value of decisions is reduced. Smaller businesses are less likely to interact with formal trademark systems because they are unable to speculate on the outcomes of legal proceedings involved. Larger firms, on the other hand, are in a better position to absorb uncertainty through the use of risk-spreading tactics and litigation expenditures.

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[288] Amritdhara Pharmacy v Satya Deo Gupta, AIR 1963 SC 449.
[289] Khoday Distilleries Ltd v Scotch Whisky Association, (2008) 10 SCC 723.
[290] F Hoffmann-La Roche & Co Ltd v Geoffrey Manners & Co Pvt Ltd, AIR 1970 SC 2062.

SUBJECTIVITY, JUDICIAL DISCRETION, AND OPACITY

There is always going to be a degree of subjectivity involved in similarity analysis, especially when it comes to evaluating how consumers perceive something. The reasoning process, on the other hand, might get muddled when an excessive amount of emphasis is placed on intuition rather than established criteria. A common practice among judicial decisions is to make reference to the "overall impression" test without providing a comprehensive explanation of the individual factors that contributed to that impression.[291]

Two important repercussions are brought about by this opaqueness. In the first place, it restricts the amount of direction that decisions can provide both applicants and adjudicators in the future. Second, it raises the costs of compliance since it forces parties to seek the assistance of expert legal counsel in order to interpret standards that are not quite clear. In terms of inclusivity, both of these outcomes are disproportionately detrimental to micro, small, and medium-sized enterprises (MSMEs) and first-time trademark applicants.

ACCESSIBILITY BARRIERS FOR MSMES AND FIRST-TIME TRADEMARK APPLICANTS

COST, RISK, AND DETERRENCE IN TRADEMARK REGISTRATION

Statutory fees are not the only costs associated with trademark registration and enforcement; there are other costs associated with legal, administrative, and opportunity costs. The possibility of opposition or infringement litigation can be prohibitive for micro, small, and medium-sized enterprises (MSMEs) and startups that operate with minimal resources.[292] This danger is made worse by the fact that it is difficult to forecast the outcomes due to the lack of assurance in the similarity standards. As a consequence of this, a great number of small businesses stall or completely avoid the process of registering their trademarks.

There is a significant element that contributes to the underutilization of formal intellectual property systems by small enterprises, according to empirical studies. This aspect is legal ambiguity.[293] In the domain of trademarks, this presents itself as a reliance on informal branding methods and unregistered marks, both of which provide little protection and restrict access to wider markets. These kinds of behaviours impair the long-term viability of a business and make growing more difficult.

OVER-DETERRENCE AND THE ABANDONMENT OF LEGITIMATE MARKS

An additional repercussion of theological uncertainty is the phenomenon of over-deterrence. There is a possibility that smaller businesses will abandon their marks out of fear of being sued, even in

[291] Parle Products (P) Ltd v JP & Co, (1972) 1 SCC 618.
[292] Ministry of Micro, Small and Medium Enterprises, Government of India, MSME Annual Report (2022-23).
[293] OECD, SMEs, Entrepreneurship and Innovation (OECD Publishing 2010).

situations when the chance of confusion is low. Notices of cease-and-desist, which are typically issued by larger companies, frequently take advantage of this mismatch by relying on the expense and unpredictability of litigation to encourage compliance.[294]

The repercussions of these phenomena extend further into the realms of innovation and competition. When trademark rights are enforced excessively, it can result in the exclusion of genuine market entrants and the consolidation of brand monopolies. Such outcomes are undesirable from the point of view of inclusive growth because they bring about a concentration of market power and restrict the diversity of entrepreneurial endeavours.

First-time applicants and Knowledge Asymmetries

Individuals who are applying for their first trademark confront unique difficulties when it comes to managing similarity rules. Information asymmetries are created when there is a lack of expertise with legal terminology, examination techniques, and judicial precedent. These asymmetries increase the need on intermediaries.[295] When it comes to early-stage inventors, the expense of professional assistance may be exorbitant, despite the fact that it is sometimes required.

Schemes that are funded by the government and are designed to facilitate intellectual property attempt to overcome these obstacles; nonetheless, the effectiveness of these schemes is limited by the inherent complexity of similarity analysis. Only limited relief can be provided by facilitation mechanisms in situations where legal norms continue to be unclear. The enhancement of accessibility necessitates not only the establishment of support mechanisms but also the attainment of doctrinal clarity.

Regional, Linguistic, and Social Aspects of Accessibility

Concerns regarding accessibility are further compounded by characteristics that are regional and linguistic in nature. Because of the perceived phonetic resemblance between the marks in question and those that already exist, markings that are drawn from vernacular languages or regional idioms may be subject to increased examination.[296]

Policy and Institutional Implications of Similarity Jurisprudence

The adjudication of trademarks does not function in a vacuum, but rather within the context of larger institutional and policy frameworks. Courts and those in charge of trademarks serve as gatekeepers, and the decisions they make regarding interpretation determine who is allowed access to intellectual property protection. In the context of visual and phonetic similarity, the absence of clearly stated

[294] Lemley, 'The Modern Lanham Act and the Death of Common Sense' (1999) 108 Yale LJ 1687.
[295] World Intellectual Property Organization, SMEs and Intellectual Property: Leveraging Intangible Assets for Growth (2019).
[296] Gangjee, Relocating the Law of Geographical Indications (CUP 2012).

norms has ramifications that reach beyond individual disputes. These implications have an effect on views of accessibility, predictability, and justice within the trademark system.

At the administrative level, the Indian Trade Marks Registry is responsible for playing a critical role at the stage of mark protection known as the entrance stage. In accordance with Sections 9 and 11 of the Trade Marks Act, 1999, examination reports frequently express objections on the grounds that the mark in question is identical to earlier marks.[297] On the other hand, complaints of this nature are sometimes couched in broad language, without providing any specific logic or explanation of how degree of resemblance has been evaluated. It can be difficult for first-time applicants and micro, small, and medium-sized enterprises (MSMEs) to successfully reply to objections of this nature, particularly in situations where similarity evaluations appear to be subjective or inconsistent between examiners.

Although examination guides and instructions have been distributed by the Registry, the application of these resources continues to be inconsistent across regional offices.[298] There is a significant amount of ambiguity and a decrease in confidence in the system as a result of the variability in examination techniques. The lack of clear and reasoned examination standards contributes to an increase in informational asymmetries and has a disproportionate impact on applicants who have limited access to expert aid. This is a concern from the perspective of inclusivity.

In turn, the courts are responsible for shaping the substantive content of similarity requirements through the use of precedent. Because of judicial inconsistency, the signalling function of case law is diminished, which in turn reduces the value of case law as a source of guidance for practitioners and applicants. When decisions are made based mostly on subjective perceptions rather than reasoning that is clearly expressed, they do not contribute to the creation of legal norms that are predictable. The ability to anticipate outcomes is an essential component of access to justice from the point of view of institutional design.[299]

An evaluation of these institutional dynamics needs to be conducted in light of India's more comprehensive innovation and growth goals. Government programs like Start-up India, Make in India, and intellectual property facilitation schemes that are geared toward micro, small, and medium-sized enterprises (MSME) place an emphasis on formalization, innovation, and entrepreneurship as drivers of equitable economic development.[300] In the context of these activities, the protection of intellectual property is frequently promoted as a tool that might facilitate progress. Such projects, on the other hand, run the danger of falling short of their revolutionary promise if trademark similarity requirements continue to be opaque or unexpected.

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[297] Trade Marks Act, 1999, ss. 9, 11 (India).
[298] Office of the Controller General of Patents, Designs and Trade Marks, Trade Marks Examination Manual.
[299] Cappelletti & Garth, Access to Justice (1978).
[300] DPIIT, Government of India, Start-up India Action Plan.

REFORM-ORIENTED RECOMMENDATIONS FOR INCLUSIVE TRADEMARK ADJUDICATION

JUDICIAL CLARIFICATION AND DOCTRINAL COHERENCE

When using visual and phonetic similarity tests, courts should aim to express their rationale more clearly. While flexibility is required to adapt for a variety of factual settings, greater clarity in expressing the relative weight given to distinct similarity variables would improve prediction. The creation of illustrative judicial guidelines, rather than rigorous codification, could help to align results while protecting judicial discretion.

SIMPLIFICATION AND STANDARDIZATION OF EXAMINATION PRACTICES

The Trade Marks Registry should implement more user-friendly and uniform testing procedures, especially for first-time applicants. Examining reports should explicitly identify the basis of similarity objections and allude to important aspects such as phonetic likeness, visual appearance, and nature of goods. Regular training and oversight can help to ensure greater uniformity across regional offices.

STRENGTHENING IP FACILITATION AND LEGAL AID MECHANISMS

Expanding and better integrating intellectual property facilitation programs that are funded by the government with trademark registration and enforcement procedures is something that should be done. IP clinics, legal assistance centers, and MSME facilitation desks that are located on university campuses have the potential to play a significant role in overcoming knowledge gaps.[301] On the other hand, the efficacy of such systems is contingent upon the clarity and predictability of the legal principles that underlie them.

CAPACITY BUILDING AND IP LITERACY

Long-term inclusion necessitates ongoing investments in IP literacy and capacity building. Awareness campaigns should cover not just the advantages of trademark registration, but also the practical issues of similarity evaluation and risk management. Empowering entrepreneurs with a rudimentary awareness of similarity principles can lessen their reliance on intermediaries and improve informed decision-making.

CONCLUSION

Both visual and phonetic similarity tests continue to play an important role in trademark protection. These tests serve the fundamental purpose of minimizing misunderstanding among consumers and maintaining the integrity of the market. The manner in which these tests are applied, on the other hand, has major implications for the accessibility of intellectual property protection and for the innovation

[301] World Intellectual Property Organization, IP for Business Series.

that is inclusive. In India, micro, small, and medium-sized enterprises (MSMEs), startups, and first-time trademark applicants face unanticipated obstacles in the form of doctrinal uncertainty and judicial variance in similarity analysis practices. One of the arguments that has been made in this study is that trademark similarity law should be rethought through the lens of accessibility and inclusion. The distributional effects of legal uncertainty are brought to light by the positioning of similarity analysis within broader frameworks of innovation and access to justice. The purpose of this endeavour is not to water down the protection afforded to trademarks; rather, it is to make certain that the institution acts as an enabling institution rather than an exclusive one. As India continues to present itself as an economy that is driven by innovation, the fact that its intellectual property system is inclusive will play a significant part in determining the outcome. It is necessary to have conceptual clarity, institutional sensitivity, and ongoing policy engagement in order to align trademark similarity standards with the objectives of inclusive growth. A recalibration of this kind is necessary in order to guarantee that trademark law allows for widespread involvement in innovation in an era that is undergoing transformation, rather than preventing it.

