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AI Liability under Copyright and Patent Law: A Comprehensive Analysis under Intellectual Property Law

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Abstract

Technology and talent are the two sides of research and development. The rapid pace of artificial intelligence (AI) evolution is transforming the basis of intellectual property (IP) rights law, especially under copyright and patenting. With AI systems increasingly producing creative works and technical inventions with minimal human involvement, traditional IP law constructs of authorship, inventorship, ownership, and responsibility are facing intense scrutiny. Traditional IP frameworks, largely dependent on human involvement, are ill-equipped to handle the complexities and challenges posed by AI-generated works. This paper employs a doctrinal and comparative approach to analyze the attribution of responsibility in AI-related copyright and patent disputes in India, the United States, the United Kingdom, and the European Union. The paper reveals inconsistencies, ambiguities, and policy gaps in existing frameworks. It critiques and compares various liability frameworks developer-centric, user-centric, and hybrid models and their implications for innovation, responsibility, and regulatory coherence. This paper contends that technology-neutral and responsive IP law reforms are necessary to strike a balance between innovation and IP law certainty in the AI-IP interface.

Keywords: *Artificial Intelligence; Copyright Law; Patent Law; Intellectual Property Rights; AI Liability;*

1. Introduction

The term ‘artificial intelligence’ has become a buzzword. It has revolutionized the individuals, corporations, governance, governments, economies to the great extent. The emergence of technologies based on artificial intelligence (AI) has radically changed the production of literary, artistic, and technological productions (Gaikwad, 2024). Artificial intelligence (AI) can now be used to produce text, music, pictures, computer code, and even more complicated technical innovations with little or no direct human effort. Deep learning and neural network machine learning models have now the ability to self-analyze extensive data and provide results which are very similar to human creativity and ingenuity. Consequently, AI-generated works and inventions no longer exist as theoretical possibilities but material realities in such domains as media, healthcare, engineering, and information technology. The technological change has made a great connotation between the AI systems and the intellectual property (IP) regime, especially when it comes to copyright and patent law. Conventional IP statutes were made on

the premise that creative and inventive work is human (Hadi et al., 2025). The invention of AI as a productive agent, however, puts these basic assumptions into question. The copyright law is now challenged with the issues of originality, authorship, and infringement concerning AI-created content, and patent law with issues concerning inventorship, novelty, and ownership of AI-created inventions. Technology-relate rapid developments have given birth to various legal challenges as well as opportunities. One side, it provides competitive advantages like automation, simplification, integration, mistake-proofing, better accuracy and maximum utilization of resources. To the other side, it raises concerns about the violation of privacy, data insecurity, various breach of contracts, digital stress etc. (Gaikwad & Bhattacharya, 2024). Law regimes have been having difficulties globally reacting to these changes in a homogenous manner. Courts and legislators as well as regulatory agencies in different jurisdictions have followed varying and in many cases, conflicting views that cause a lot of confusion as to the legal responsibility and liability.

2. Background of Study

In legal terms, AI should be viewed as a technology that works based on algorithms, data processing, and adaptive learning processes instead of being a separate legal entity (Mishra, 2025). Regarding the intellectual property law, the use of AI systems is pertinent because of its ability to produce innovative and imaginative results. The AIs can be divided into narrow or weak AI that executes certain duties and advanced or autonomous AI that can work with minimum interference of a human being. In the copyright and patent scenarios, AI can either be used as an aid to “help human authors or as a system to produce outputs by its own. This difference is important because the scope of human intervention has a direct impact on the legal decisions regarding authorship, inventorship, and liability. One of the key assumptions that this research will make is that AI does not have legal personality. Contrary to natural persons or juridical entities, AI systems are not subject to the current legal structures with the opportunity to bear the rights or duties. As a result, all the legal responsibility of AI-created works should be shifted to human or corporate actors, whose actions are related to creating, deploying, or using these systems.

3. Statement of the Problem

Although the protection and infringement of AI-generated works and inventions under the copyright and patent law have been on the rise, the protection and infringement of AI-generated works lack clarity and consistency on the issue of liability. Current laws in IP are silent on situations where AI generates creative or inventive works on its own (Pundir et al., 2025). This legislative silence has caused different judicial interpretations in different jurisdictions especially on authorship, inventorship and ownership. Also, it is difficult to define who is responsible in copyright infringement or patent violations with AI systems. One wonders whether it is the AI developer, the system owner, the user or some other intermediary who should be held accountable. These unavoidable challenges impose legal ambiguity and problems in the proper protection of the intellectual property.

4. Significance of the Study

The importance of this research is that it would look at the legal ambiguity of AI liability and its extended consequences on innovation and creativity. Discouragement of investment, hindrance of technological growth, and aggravation of liability risk on creators and industries that are dependent on AI technologies may all be a result of unclear liability standards. In addition, the results of this study have significant

policy implications to legislators and courts that want to update their IP systems in order to keep up with technological advances. The research is also applicable to students, both in the academic fields because the study offers an interdisciplinary perspective of the interaction between law, technology and innovation. Through the critical analysis of AI liability under the copyright and patent laws, the research helps to add to the current discussion about the future regulation of intellectual property in the era of artificial intelligence.

5. Objectives of Study

•To examine the conceptual and doctrinal challenges posed by artificial intelligence systems

•To analyze the existing legal frameworks and judicial interpretations governing AI-generated works and inventions

•To provide the better solutions for the usage of AI within the contexts of copyright and patent law

6. Research Questions

- How do artificial intelligence systems challenge traditional legal concepts of authorship, inventorship, ownership, and liability under copyright and patent law?
- To what extent do existing copyright and patent frameworks adequately address AI-generated works and AI-assisted inventions?
- Who should bear legal liability for infringement or invalid claims arising from AI-generated outputs—developers, users, deploying entities, or the AI system itself?
- How have different jurisdictions interpreted and responded to AI-related disputes concerning inventorship, authorship, and intellectual property protection?
- What regulatory reforms or policy models can effectively balance innovation, accountability, and public interest in governing AI liability within intellectual property law?

7. Review of Literature

More recent scholarship has shifted toward comparative and policy-oriented evaluations, examining how different jurisdictions address AI inventorship and liability attribution. Studies reveal divergent approaches: while some jurisdictions strictly deny AI authorship or inventorship, others explore flexible or sui generis models to accommodate technological realities (Ginsburg & Budiardjo, 2019). Legal commentators also stress the risk of regulatory fragmentation, which may undermine innovation incentives and global harmonization efforts (Yanisky-Ravid & Liu, 2018). Overall, the literature converges on the need for adaptive legal frameworks that preserve the incentive structure of intellectual property law while ensuring accountability, fairness, and public interest protection in the AI-driven digital economy.

According to Kazimi and Thalwal, (2024a), with the help of a comparative legal framework, explore the changing legal issues of artificial intelligence and machine learning within intellectual property protection. The paper critically examines the way various jurisdictions deal with such issues as AI-generated works, inventorship, ownership, and liability in infringement. The authors point to the fact that conventional IP doctrines, which mostly play human-centric roles, do not support autonomous and semi-autonomous AI

systems. Through a comparative analysis of the legal practices in the jurisdictions like the United States, the European Union and some Asian nations, the paper indicates that there is a lot of fragmentation and uncertainty in regulations. The authors claim that because of the absence of harmonized standards, there are enforcement challenges and a discouragement to innovate. The paper argues that adaptive legal reforms, such as re-definition of the criteria of authorship and inventorship and the creation of sui generis protection over AI-generated works are necessary. Altogether, the article provides a useful contribution to the discussion of the comparative law of AI-driven creations and the importance of updating the policy.

Marchenko et al. (2024) presented a thorough comparative study of intellectual property legal systems in the European Union member states under the context of the use of artificial intelligence. The paper assesses the national legislations in regards to the AI-driven innovation and the assessment is based on the copyright, patent, and other rights legislation. Among the differences that the authors point to are the differences in the interpretation of AI functionality to high-status authorship, inventorship and liability despite the general EU guidelines and law. The article addresses the effects of the EU Artificial Intelligence Act and GDPR on IP protection, focusing on the issues of ownership of data, the transparency of algorithms, and international enforcement. The writers are of the opinion that although, harmonization activities are being undertaken at the EU level, national legal differences continue to pose a threat to innovators and rights holders. The paper ends by suggesting that there should be more alignment between national IP policies and EU-wide AI regulatory frameworks to have uniform protection and encourage innovation in the digital single market.

In the study, Kazimi and Thalwal, (2024b) discuss the intellectual property protection strategies that can be offered to innovations in AI using a comparative legal approach. The authors examine the impact of the current IP regimes on inventions and creative works being created with high levels of AI involvement. Some of the critical questions discussed are the eligibility of patents, right to own a copyright, and the legal position of AI as a creator or an inventor. The paper determines materially varied interpretations and enforcement of the law by comparing the regulatory methods used in different jurisdictions. The authors note that the existing IP regimes are not quite capable of striking a balance between innovation impetus and popular goodwill when AI systems autonomously produce valuable results. The paper suggests to establish practical rules of law acknowledging the presence of human -AI cooperation and not granting legal citizenship to AI systems. The paper makes a contribution to the current academic debate, as it suggests that the international cooperation is necessary.

Sharma (2024) critically analyzed the liability in intellectual property disputes occurring during the usage of artificial intelligence technologies. The paper concentrates on the issues of AI-generated content, algorithmic decision-making, and autopilot in deciding who is the authority in the infringement of IP. Sharma believes that the conventional model of liability with references to the human intent and control is more and more insufficient in the reality of AI-driven creativity and innovation. The article considers the situation between a developers, users, data providers, and platform operators stating that it is challenging to point the finger when infringement is present. The author suggests a new definition of the liability standards with the implementation of such concepts as shared responsibility and the accountability based on risk. By contextualizing the discussion in the growing trend of judicial rulings, as well as the policy discussion, the paper provides a useful doctrinal understanding of the potential change in the IP liability regulation in the era of artificial intelligence.

Picht et al. (2022) offered a policy-oriented, detailed study of the nexus between artificial intelligence and intellectual property law. The paper does not just identify the problem but also suggests legal and regulatory changes that should be implemented. The authors diagnose the following challenges, such as the protection of AI-generated works, patent inventorship, access to the data, and the dangers of the concentration of the market facilitated by AI technologies. They contend that the current IP structures are not well placed to address them because they are based on the human creativity and inventorship. The study provides a balanced and proactive plan to change the intellectual property law to meet the realities of artificial intelligence by combining the law analysis with the economic and innovation policy considerations.

8. Research Methodology

This study adopts a **doctrinal legal research methodology**, which focuses on the systematic examination, interpretation, and critical analysis of existing legal principles governing artificial intelligence (AI) liability under copyright and patent law. Doctrinal research, also known as "black-letter law" research, involves the identification and evaluation of statutory provisions, judicial precedents, regulatory instruments, and scholarly commentaries to determine the current state of law and its internal coherence (Hutchinson & Duncan, 2012). Given that AI liability raises complex questions regarding authorship, inventorship, ownership, and infringement, a doctrinal approach is particularly appropriate as it enables a structured analysis of how established intellectual property (IP) doctrines apply or fail to apply to AI-generated works and inventions. The study relies on primary legal sources such as national copyright and patent statutes, landmark judicial decisions, and policy documents from selected jurisdictions, alongside authoritative secondary sources including law review articles and institutional reports.

The research further incorporates a **comparative doctrinal framework**, examining legal developments in India, the United States, the United Kingdom, and the European Union. Comparative analysis facilitates the identification of convergences, divergences, and emerging trends in AI liability attribution across jurisdictions (Zweigert & Kötz, 1998). Through interpretative and analytical techniques, the study evaluates competing models of liability developer-based, user-based, and hybrid approaches while assessing their consistency with foundational IP objectives such as innovation incentives, fairness, and legal certainty. The doctrinal method also allows normative evaluation, enabling the formulation of reasoned proposals for regulatory reform grounded in existing legal theory and comparative practice. By synthesizing statutory interpretation, case law analysis, and policy discourse, the methodology ensures a comprehensive and academically rigorous examination of AI liability within contemporary intellectual property law.

9. AI Liability under Copyright Law

9.1 Copyright Protection and AI-Generated Works

Traditionally, copyright law safeguards original literary, artistic, musical and dramatic work, which is embodied in a physical form of expression. Such a series problems the structure of AI-generated works especially in the topics of the notion of originality and fixation. In the majority of jurisdictions originality assumes only a small level of human innovation or intellectual work. Nevertheless, when the AI system will create content on its own through algorithmic means and training data, the existence of human creative input seems unclear (Khan, 2024). This brings up basic questions of whether AI generated outputs can

meet the originality threshold set by the copyright law. Fixation, that a work must be manifested in some tangible form, is typically a less controversial concept in the AI context, since AI outputs are typically in a digital form. However, obsession is not enough to get a copyright protection without originality that can be attributed to a human author. As a result, most jurisdictions are still reluctant to grant copyright protection to works that are generated by purely AI, which creates uncertainty on whether they have a legal status and are entitled to protection.

9.2 Authorship and Ownership Challenges

The need to have a human writer is one of the most disputable questions of AI-generated works. The copyright laws in various jurisdictions are purely anthropocentric, admitting natural or laws persons. In the current legal systems, AI cannot be considered an author as it does not have any legal personality. This poses a legal gap in the case of generation of works without direct creative involvement by humankind (Eviani et al, 2024). There have been different ownership models that have been advanced in order to deal with this challenge. In the employer model, an ownership interest can be held in an organization that uses the AI system, which bears the idea of works made for hire. As an alternative, the programmer model credits authorship to the person or organization that creates the AI system whereas the user model credits authorship to the person who drives or directs the output of the AI. Both models have conceptual and practical challenges especially when trying to establish how much contribution is made by a human being. A lack of clear statutory coverage has led to inconsistencies in judicial interpretation, which has made still harder the question of attribution of authorship and ownership.

9.3 Copyright Infringement by AI

Artificial intelligence systems tend to use large datasets to be trained, many of which contain copyrighted content. This is of great concern to the issue of copyright violation especially when such data has been employed without permission. The AI model training process can be associated with duplicating, saving, and analyzing copyrighted information, which can violate reproduction rights. Moreover, AI-generated results could be similar to the already copyrighted products which could stir the accusations of creative works or a significant similarity (Li & Huang, 2025). The infringement in such instances is complicated to determine, whereby AI does not deliberately copy but it creates content through already learned patterns. In some regions, e.g. in the fair use or fair dealing defense, the use can be fair use or fair dealing. Nevertheless, such doctrines have not been applied to the field of AI training and outputs, and therefore, there is still a legal uncertainty with respect to the infringement liability.

9.4 Liability Attribution Models

The responsibility of the infringement of the copyright through the use of artificial intelligence systems is one of the most topical questions of the IP law attribution. It ought to be left on the creators of AI systems and those who train them particularly where massive abuse may be anticipated. Nevertheless, an innovation can be counterproductive to such a solution, and it may overload the developers (Salle & Rini, 2025). The user liability transfers the responsibility on individuals or organizations implementing AI systems and who benefit off of their product. This type of model aligns with the traditional norms of control and responsibility but may not be adequate in the case users lack technical expertise related to the role of AI. The second one is the strict liability in which the liability is assumed whether we will it or not, this will better defend the rights but will discourage the technological progress. Compared, fault-based

liability has to prove negligence or intent with more flexibility but hard to prove. The necessity arises thus to create a balance in regards to the liability to level out the scope of innovation and protection of copyright.

10. AI Liability under Patent Law

10.1 Patentability of AI-Generated Inventions

The inventions that meet the inventive step, novelty and industrial applicability criteria are safeguarded under the patent law (Kop, 2019). The AI-generated inventions are problematic to all of these requirements. Although AI systems can generate the new and industrially viable solutions, there is still a requirement of the inventive step, and it is traditionally assumed that the human ingenuity is involved. In the case where AI has independently created an invention, it is complicated to identify whether it entails a non-obvious inventive contribution. In addition, the patent systems are created to compensate human inventors in their intellectual work. Allowing AI-created inventions to be patented without an explicit attribution system is a threat to the existence of the ground rules of patent law. As a result, patenting organizations across the world have not been able to determine the patentability of inventions produced by AI processes.

10.2 AI as Inventor: Legal Debate

The controversy about whether AI qualifies as an inventor received wider publicity because of the DABUS cases, in which an AI system was declared as the named inventor in patent applications in several jurisdictions (Bharati, 2024). These applications were consistently denied in the United States, the United Kingdom and European Union by their respective courts and patent offices, with the stress on the clear legal requirement of the inventorship by natural persons. Such rulings indicate that the world is in agreement that AI is not legally competent to be an inventor as per the current patents' legislation. They however reveal the shortcomings of existing frameworks on dealing with technological realities as well. Although a few scholars have suggested that AI inventorship or sui generis protection should be recognized, others claim that this would cause a disturbance in the current incentive systems and accountability in the patent law.

10.3 Patent Ownership and Enforcement Issues

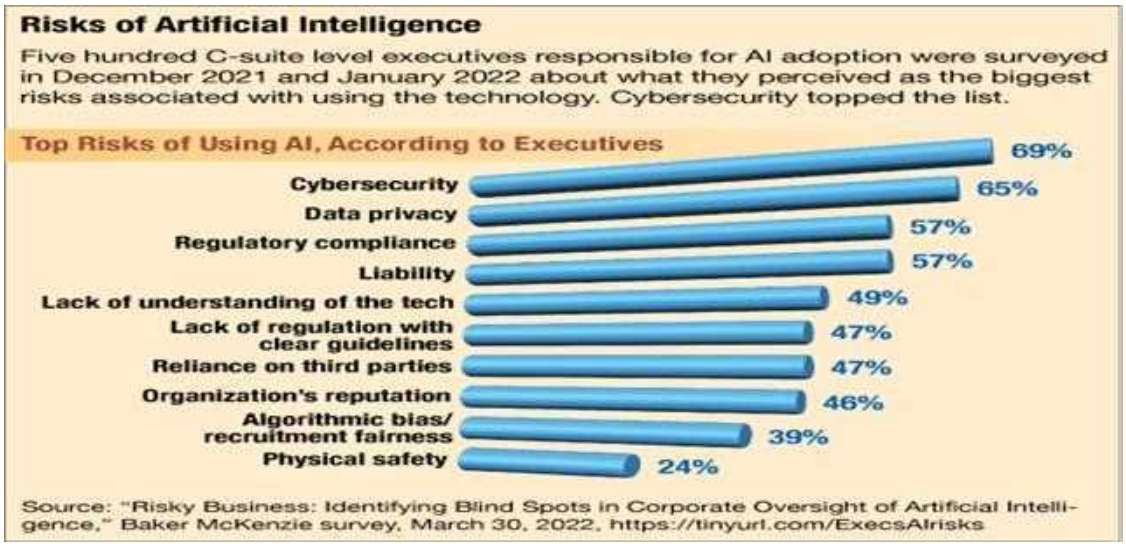
This is despite the fact, even in that case, when AI-generated inventions are considered patentable, the ownership and enforcement remain unaddressed (Mahala & Chauhan, 2024). It is especially hard to assign the creative effort when it is indirect or trivial and human interference. There is a question of whether the AI developer, system owner, employer or user should be the one to own a property. The law enforcement of patent rights is also complicated in the cases when the AI systems infringe upon the existing patents independently. To ascertain the existence of liability in such infringement, control, foreseeability and benefit are to be evaluated. The liability in patent just like the copyright law can be transferred to developers or the people using the patent, depending on the situation. Nonetheless, there is no clear statutory direction making it hard to enact and makes judicial procedures more uncertain.

10.4 Comparative Jurisdictional Analysis

The patent and copyright laws in India are silent concerning AI-generated work and invention, following strictly the human-centered concept of authorship and inventions. The Indian courts have not specifically considered AI liability and as a result, have applied the old time principles of agency liability and vicarious liability. This human-centric orientation is used similarly in the United States as the courts and patent office's not only reject the inventorship of AI but also insist on human responsibility. The doctrine of fair use grants certain flexibility to the copyright issues but does not show any clear applicability in the case of AI training practices. The European Union has adopted a more regulatory approach by suggesting AI-specific regulation but insisting on human authorship in the IP law. Even though the EU has not been able to acknowledge AI as a right-bearing body, its policy-based strategy is an indication of a developing paradigm where innovation should be balanced with legal responsibility.

11. Discussion and Analysis

Figure 1: AI and Cyber Security Risks



The above figure presents survey findings from 500 C-suite executives regarding the top risks associated with artificial intelligence adoption. Cybersecurity emerges as the most significant concern (69%), followed by data privacy (65%), indicating that information protection remains the dominant strategic anxiety in AI deployment. Regulatory compliance and liability (both 57%) also rank highly, reflecting uncertainty about evolving legal frameworks and accountability structures. Organizational concerns extend to technological literacy (49%), lack of clear regulatory guidelines (47%), and reliance on third parties (47%), highlighting governance and oversight challenges. Reputational risk (46%) and algorithmic bias in recruitment (39%) suggest ethical and brand-related implications of AI systems, while physical safety (24%) is perceived as comparatively lower but still relevant.

The results of the presented research have bad legal and policy implications. The weaknesses of the current intellectual property systems indicate that there is an immediate necessity to reform the legislation or clarify the courts in the context of AI-created works or inventions. The lack of clarity on liability may make rights holders unable to defend their intellectual property and developers and users of AIs face more risks of being sued (Lalanda, Roig, 2025). Such a legal uncertainty can discourage innovation and investment in AI technologies, and, eventually, slow down the technological improvement. Human-centric

nature of liability attribution, although it is consistent with the classical principles of the law, casts doubt on the question of fairness and accountability. The imposition of liability on developers or users without any clear control or intent parameters can lead to excessive liability, which will undermine the proper development and implementation of AI systems. On the other hand, lack of liability systems will expose rights holders to lack of useful redress. This conflict highlights the necessity to develop the balanced versions of the liability models that take into account the levels of human involvement, the predictability of the damage, and the character of the AI autonomy. On policy grounds, the challenge will be that of balancing between innovation and accountability. Too strict systems of liability are likely to kill off technological progress, whereas too lenient systems are likely to weaken intellectual property rights (Tanwar & Poply, 2024). A more sophisticated system that incorporates fault-based liability and tries together with sector-specific principles would be a better solution. Also, globalization of AI-associated intellectual property would eliminate jurisdictional differences and facilitate legal certainty. More importantly, the research proves that there is a possibility that the marginal adjustments in the current IP doctrines are not enough to overcome the complications presented by AI. Rather than that, the policymakers might have to think about sui generis frames or hybrid options regarding the reality of recognizing the specific features of the AI-generated output yet retaining the fundamental postulates of intellectual property rights. These reforms would keep the intellectual property law to be responsive, equitable, and able to control innovation in the era of artificial intelligence.

12. Findings of Study

- Cybersecurity (69%) and data privacy (65%) are perceived as the most critical risks associated with AI adoption, indicating that executives prioritize information security and protection of sensitive data over other operational or ethical concerns. This reflects a strong awareness of digital vulnerability and potential financial and reputational damage arising from cyber threats.
- Legal and governance-related risks such as regulatory compliance (57%), liability (57%), lack of clear guidelines (47%), and reliance on third parties (47%) collectively rank higher than ethical issues like algorithmic bias (39%) and physical safety (24%). This suggests that organizational leaders are more concerned about legal accountability and regulatory uncertainty than about broader societal or safety implications of AI deployment.
- An examination of the statutes, judicial rulings, and policy texts in a chosen number of jurisdictions has shown that there are serious gaps in the current intellectual property models when used in relation to works and inventions created by artificial intelligence. The existing copyright and patent laws were created on a basic premise that creative and inventive activities are purely human ones. Consequently, the frames do not clearly outline how authorship, inventorship, and liability in the event that AI systems are used with limited human interference are to be attributed. Such a gap in the doctrine sets a grey area of the legal standing of AI-generated outputs and undermines the applicability of intellectual property rights.
- One of the main observations of the research is that there is a widespread anthropocentric prejudice in the attribution of liabilities. In various jurisdictions, courts and legislatures still demand the definition of a natural person as the person who is the author or inventor even in a situation where the AI system creates content or an invention without human involvement. Although this method maintains the principles of traditional law, it frequently contributes to artificial or even forced assignment of responsibility to developers, users, or employers who could not have had any significant creative or innovativeness of control. The risks of such attribution are that the

conceptual integrity of intellectual property law would be jeopardized and would not deal well with technological realities.

- The paper also finds that there is a significant discrepancy in how jurisdictions tackle AI-related intellectual property problems. Whereas jurisdictions like the United States and the United Kingdom have relatively rigid human authorship and inventorship criteria, the European Union has been more policy-focused and proactive by the means of regulatory actions related to the governance of AI. Conversely, other jurisdictions such as India have not come up with judicial or legislative defines on AI liability. Such conflicting policies result in fragmented legal frameworks, which make cross-border innovation and enforcement of intellectual property rights in a digital economy that is globalized difficult.

13. Conclusion

All of the above discussion shows that the analysis underscores that the rapid integration of artificial intelligence into organizational and creative ecosystems has outpaced the evolution of traditional intellectual property frameworks, particularly in relation to liability under copyright and patent law. The growing autonomy of AI systems challenges established doctrines of authorship, inventorship, and accountability, exposing doctrinal gaps and regulatory inconsistencies across jurisdictions. As evidenced by both legal debates and executive risk perceptions, concerns surrounding liability, compliance, and governance remain central to AI adoption. Therefore, a coherent, adaptive, and innovation-sensitive legal framework is essential to balance technological advancement with accountability, legal certainty, and protection of public interest within the evolving landscape of intellectual property law. This paper has explored the problem of liability of artificial intelligence through copyright and patent law, noting that the current intellectual property laws are not fully capable to provide sufficient protection to AI-generated content and inventions. The results indicate that the existing legislation is still largely human oriented, and it does not provide a clarity in assigning a title of authorship, inventions as well as liabilities. The study addresses the key questions by establishing that AI is not currently capable of legal responsibility and that the responsibility is indirectly transferred on the developers, users, or owners via conventional doctrines. Finally, the paper concludes that even though the current IP legislation offers partial guidance. A lot of reforms are required in order to guarantee legal clarity, accountability, and balance technological innovation.

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