

COMPARATIVE ANALYSIS OF GLOBAL AI-IP REGULATIONS AND ACCOUNTABILITY MODELS

Karia Zeel Manojkumar, Dr. Akta Mehta

Research Scholar, University School of Law, Gujarat University, Ahmedabad, Gujarat
Email: zeel.karia1996@gmail.com Contact No: 7990495727,

Assistant Professor, I.M.Nanavati Law College, Gujarat University, Ahmedabad, Gujarat
Email: mehtaakta@gmail.com Contact No: 9429416716

Abstract

The rapid evolution and widespread adoption of **artificial intelligence (AI)** have created significant challenges for **intellectual property (IP) rights**, as well as for **innovation, transparency, and accountability**. AI systems now routinely generate, process, and transform works and subject matter traditionally protected by IP law, leading to complex legal questions about **authorship, ownership, infringement, training data usage, licensing, and responsibility** for AI-generated outputs.

This research paper undertakes a **comparative analysis** of emerging global regulations and accountability models at the intersection of AI and IP. It critically examines how major jurisdictions and international initiatives address issues related to **copyright, patents, trade secrets, and data-related rights**. The analysis focuses on regulatory responses to **AI training data, text and data mining, transparency and disclosure obligations, authorship and inventorship, liability for infringement, and mechanisms for enforcement and redress**. Particular attention is given to the roles and responsibilities of **AI developers, deployers, users, rights holders, and other stakeholders** throughout the AI lifecycle.

Employing a **doctrinal and comparative methodology**, the study analyses **legislation, judicial decisions, regulatory instruments, policy documents, international standards, and scholarly literature** from the **European Union, United States, United Kingdom, India, and selected international bodies**. It evaluates whether existing IP frameworks are adequate for emerging AI-specific challenges, or if complementary governance tools—such as **risk assessment, transparency, traceability, human oversight, auditing, and effective remedies**—are required.

The findings reveal a **fragmented global regulatory landscape**, with no single, unified model for AI-IP governance. In response, the paper explores the need for a more **coherent and interoperable framework** that can maintain a balance between **technological innovation** and the **protection of intellectual property rights**. The study concludes by proposing key principles for effective and accountable AI-IP regulation, advocating for interoperability, legal certainty, responsible innovation, and robust rights protection within the rapidly evolving AI ecosystem.

Keywords: Artificial Intelligence; Intellectual Property Rights; AI Regulation; AI Accountability; Copyright; Patent Law; AI Training Data; Transparency; Liability; Comparative Legal Analysis.

INTRODUCTION

Artificial intelligence (AI) has rapidly evolved into a transformative technology capable of generating, processing, analysing, and reproducing creative and technical outputs that were once the exclusive domain of direct human intellectual effort. Generative AI systems now produce text, images, music, software code, and designs in response to human prompts, while machine learning models train on vast collections of copyrighted works, databases, software, and other protected materials. This increasing integration of AI into creative and innovation processes has led to a complex intersection between technological development and **intellectual property (IP) law**.¹

Traditionally, IP law is built around the clear identification of human creators, inventors, owners, and infringers. However, AI technologies disrupt these assumptions by introducing a web of actors—developers, model providers, deployers, users, data suppliers, rights holders, and intermediaries—across the production chain. This shift raises fundamental legal questions: Can AI-generated outputs qualify for copyright? Who is the author or owner of such works? Should AI systems be recognized as inventors under patent law? Under what conditions does the use of protected works for AI training amount to infringement, or fall under exceptions and limitations?²

¹ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Technology Trends 2019: Artificial Intelligence* 8–15 (WIPO 2019)

² DANIEL J. GERVAIS, *THE MACHINE AS AUTHOR* 1–10 (forthcoming discussion of authorship and artificial intelligence); see also U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 2: Copyrightability* 1–8 (2025)

Copyright issues are especially prominent in generative AI. The creation of large-scale models often involves the collection and computational analysis of extensive literary, artistic, musical, audiovisual, and software works. Legal responses to these practices differ widely: some jurisdictions provide explicit text-and-data-mining exceptions or licensing schemes, while others rely on copyright infringement doctrines, fair use, or contractual arrangements.³ This diversity leads to uncertainty for both AI developers seeking access to data and creators aiming to control the use of their works.

Patent law faces parallel but distinct challenges. The debate over whether an AI system can be an “inventor” underscores the enduring human-centric foundation of patent regimes. Courts and patent offices in most jurisdictions continue to require human inventorship, even as AI-assisted invention becomes more sophisticated, raising questions about recognizing individual human contributions in complex innovation processes.⁴

Regulatory responses are increasingly varied. The **European Union** has implemented a comprehensive, risk-based framework through the EU Artificial Intelligence Act, complemented by new rules affecting copyright and AI-generated content as part of its digital strategy.⁵ The **United States** relies on existing copyright, patent, and administrative mechanisms, augmented by policy guidance and ongoing judicial developments.⁶ The **United Kingdom** has pursued a mix of legislative reform, policy consultation, licensing, and voluntary or sectoral governance approaches.⁷ Meanwhile, **India** is developing its own AI governance within a broader digital regulatory context, addressing innovation, responsible AI, data governance, and IP protection.⁸

On the international stage, the **World Intellectual Property Organization (WIPO)** has acknowledged AI’s impact on copyright, patents, data, and innovation policy, fostering dialogue for appropriate global IP responses.⁹ International AI governance initiatives increasingly highlight principles such as transparency, accountability, human oversight, risk management, and responsible innovation.¹⁰ Thus, modern AI-IP regulation cannot rely solely on traditional doctrines of infringement or ownership; it must also incorporate accountability mechanisms spanning the AI lifecycle.

Accountability has become central to contemporary AI-IP governance. Responsibility now arises at every stage: acquisition and processing of training data, model development, deployment, content generation, distribution, and commercial use. Effective accountability requires transparency in training practices, documentation of datasets and models, robust record-keeping, risk assessment, auditing, meaningful human oversight, avenues for rights-holder objections, and accessible remedies. These measures distribute responsibility across the technological and organizational networks that characterize the modern AI ecosystem.

Comparative analysis is critical, as regulatory divergence across jurisdictions can generate legal uncertainty and practical impacts on global AI development. Differences in copyright exceptions, licensing, disclosure, authorship, inventorship, liability, and enforcement shape how AI developers operate internationally and how rights holders protect their interests. Excessive fragmentation increases compliance costs and may create conflicting obligations, while overly uniform rules might ignore important local legal and innovation needs.

In light of these complexities, this research undertakes a comparative analysis of global AI-IP regulations and accountability models. It examines the legal frameworks of selected jurisdictions and international institutions regarding AI training data, copyright, patents, ownership, liability, transparency, and enforcement. The study assesses the effectiveness of existing IP principles for resolving AI-related disputes and identifies where supplementary accountability mechanisms may be needed.

The primary objective is to go beyond a comparison of substantive rules and examine how various regulatory systems allocate responsibility among the multiple actors in the AI ecosystem. The research investigates

³ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *Generative Artificial Intelligence and Intellectual Property* 7–18 (WIPO 2024)
⁴ *Thaler v. Vidal*, 43 F.4th 1207, 1210–13 (Fed. Cir. 2022); *Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, [2023] UKSC 49, [1]–[5]

⁵ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence, 2024 O.J. (L 168) 1, 1–144

⁶ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 3: Generative AI Training* (Pre-Publication Version 2025)

⁷ UK INTELLECTUAL PROPERTY OFFICE, *Artificial Intelligence and Intellectual Property: Copyright and Patents* (2022)

⁸ NITI AAYOG, *Responsible AI for All: Approach Document for India, Part 1—Principles for Responsible AI* 1–20 (2021)

⁹ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Conversation on Intellectual Property and Artificial Intelligence* (2019–2024)

¹⁰ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, *OECD Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024)

whether emerging frameworks can balance technological innovation with the protection of IP rights, and explores the prospects for greater regulatory coherence grounded in transparency, traceability, human responsibility, risk-based governance, effective enforcement, and accessible remedies. Adopting such an approach could help develop an AI-IP governance framework that is both responsive to technological change and capable of preserving legal certainty and the legitimate interests of creators, inventors, developers, users, and society at large.

LITERATURE REVIEW

The intersection of **artificial intelligence (AI)** and **intellectual property (IP)** has sparked a rapidly growing body of legal scholarship. This literature addresses issues ranging from **authorship, inventorship, copyright infringement, and training data use** to **ownership, licensing, transparency, and accountability**. Scholars collectively demonstrate that AI does more than create new technological products—it fundamentally challenges the assumptions underlying traditional IP frameworks. Five key themes emerge in current research:

1. AI-Generated Works, Authorship, and Inventorship

Early debates focused on whether machines could produce legally protectable works or inventions. **Pamela Samuelson** established that human authorship remains central in copyright law, even as generative AI now produces sophisticated outputs with minimal human input.¹¹ The **U.S. Copyright Office** maintains that copyright protection depends on sufficient human creative contribution—mere prompting is not enough.¹²

In patent law, **Ryan Abbott** has argued for reevaluating inventorship when AI meaningfully contributes to inventions.¹³ However, courts in the **U.S.** and **U.K.** have reaffirmed the legal necessity of human inventors, as seen in **Thaler v. Vidal** (U.S.) and **Thaler v. Comptroller-General of Patents** (U.K.).¹⁴

2. Copyright and AI Training Data

A major focus is the use of copyrighted material to train AI models. **Samuelson's** work on fair use and innovation highlights the tension between rights holders' interests and the need for large datasets.¹⁵

- In the **European Union**, text-and-data mining (TDM) exceptions were introduced to address the legality of AI training, affecting lawful access, rights reservations, and commercial use.¹⁶
- The **U.K.** continues policy consultations on TDM, licensing, and transparency, with recent government reports revealing disagreement among stakeholders.¹⁷
- The **U.S.** relies on existing copyright doctrine and policy analysis, focusing on fair use, copying in training, and licensing.¹⁸

3. Regulatory Approaches: EU, U.S., and U.K.

- The **EU Artificial Intelligence Act** establishes a horizontal, risk-based regulatory framework, integrating transparency and documentation requirements that impact both copyright and accountability.¹⁹ This approach bridges AI governance and IP protection.
- **U.S.** literature is shaped by ongoing litigation and policy analysis regarding copyright, substantial similarity, and output-related infringement. The U.S. Copyright Office has also addressed digital replicas, AI-generated outputs, and training data.²⁰
- In the **U.K.**, recent policy has shifted from narrow legality questions to broader accountability: transparency in training material, licensing, technical standards, and enforcement are now central.²¹

¹¹ Pamela Samuelson, Allocating Ownership Rights in Computer-Generated Works, 47 U. PITT. L. REV. 1185, 1185–1200 (1986)

¹² U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 2: Copyrightability* (2025)

¹³ Ryan Abbott, I Think, Therefore I Invent: Creative Computers and the Future of Patent Law, 57 B.C. L. REV. 1079, 1080–1105 (2016)

¹⁴ *Thaler v. Vidal*, 43 F.4th 1207, 1210–13 (Fed. Cir. 2022); *Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, [2023] UKSC 49, [1]–[5]

¹⁵ Pamela Samuelson, Unbundling Fair Uses, 77 FORDHAM L. REV. 2537, 2537–70 (2009)

¹⁶ 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, 2019 O.J. (L 130) 92, arts. 3–4

¹⁷ UK INTELLECTUAL PROPERTY OFFICE, *Artificial Intelligence and Intellectual Property: Copyright and Patents—Government Response to Consultation* (2022)

UK GOVERNMENT, *Report on Copyright and Artificial Intelligence* (2026)

¹⁸ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 3: Generative AI Training* (Pre-Publication Version 2025)

¹⁹ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence, 2024 O.J. (L 168) 1

²⁰ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence* (2024–2025)

²¹ UK GOVERNMENT, *Copyright and Artificial Intelligence: Consultation Paper* (2024)

UK GOVERNMENT, *Report on Copyright and Artificial Intelligence* (2026)

4. India and Emerging Economies

Indian literature examines AI through the lens of existing IP law, data governance, and digital regulation. NITI Aayog's responsible AI principles—safety, equality, inclusivity, privacy, transparency, accountability—support innovation while highlighting the need for new regulatory approaches.²² India's evolving framework illustrates the challenges of aligning emerging AI technologies with established IP doctrines.

5. International and Global Perspectives

International organizations seek harmonization and interoperability:

- **WIPO** facilitates cross-border dialogue on patents, copyright, inventorship, and innovation.²³
- **OECD** and **UNESCO** emphasize responsible stewardship, transparency, human rights, and ethical AI.²⁴

These instruments provide norms for accountability but do not replace national IP laws. The literature now distinguishes between **substantive IP protection** (what rights exist) and **procedural accountability** (who must document, disclose, and remedy AI's impacts).

6. Accountability Models in AI-IP Governance

The field is moving from exclusive rights-based models to **lifecycle accountability**. AI complicates the identification of owners and infringers, as responsibility is distributed across developers, suppliers, deployers, and users. Key mechanisms now include:

- Documentation and traceability
- Human oversight and impact assessment
- Risk classification and auditing
- Procedures for rights holders to challenge or seek redress

International standards like the **OECD AI Principles** and **UNESCO's AI framework** reinforce these accountability dimensions.²⁵

7. Comparative Assessment and Gaps

Literature shows consensus on several issues:

- Human authorship/inventorship remains central.
- AI training on copyrighted works is contentious.
- Jurisdictions diverge on TDM, fair use, licensing, and computer-generated works.
- New regulation supplements IP laws with transparency and accountability.

However, **fragmentation persists**:

- Copyright literature often treats AI training separately from broader governance;
- AI governance literature often overlooks connections to substantive IP rights;
- Most comparative studies focus on the EU and U.S., with less on India and emerging economies.

8. Research Gap and Contribution

A key gap is the absence of an **integrated comparative framework** linking IP rights, regulatory models, and accountability mechanisms across legal systems. Most studies analyze individual components (copyright, training data, fair use, inventorship, governance) in isolation. There is less scholarship on how these components interact throughout the AI lifecycle.

This research addresses the gap by comparing substantive IP rules with procedural accountability in selected jurisdictions. It asks not only what rights are protected, but also:

- Who bears responsibility?
- What transparency is required?
- How is compliance monitored?
- What remedies are available when AI impacts IP rights?

The result is a multidimensional picture of AI-IP regulation as a matter of law, technology, institutional responsibility, transparency, enforcement, and international coordination.

²² NITI AAYOG, *Responsible AI for All: Approach Document for India, Part 1—Principles for Responsible AI* (2021)

²³ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Conversation on Intellectual Property and Artificial Intelligence* (2019–2025)

²⁴ OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024)

UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (2021)

²⁵ OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024); UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (2021)

RESEARCH QUESTIONS

The present study seeks to address the following research questions:

1. How do major jurisdictions regulate the intersection between **artificial intelligence** and **intellectual property rights**, particularly regarding **copyright**, **patents**, **authorship**, **inventorship**, and **AI training data**?
2. What are the principal **similarities and differences** among the **AI-IP regulatory frameworks** of the **European Union**, **United States**, **United Kingdom**, **India**, and relevant **international frameworks**?
3. How do existing legal frameworks **allocate responsibility and liability** among **AI developers**, **providers**, **deployers**, **users**, **data suppliers**, and other actors involved throughout the **AI lifecycle**?
4. To what extent do existing AI-IP regulations incorporate **accountability mechanisms** such as **transparency**, **disclosure**, **traceability**, **documentation**, **human oversight**, **auditing**, **monitoring**, and **effective remedies**?
5. What **legal and regulatory challenges** arise from the **fragmentation** of global AI-IP frameworks, particularly regarding **cross-border AI development**, **use of copyrighted training data**, and **AI-generated or AI-assisted outputs**?
6. Whether existing **intellectual property laws** and **emerging AI governance frameworks** are adequate to protect the legitimate interests of **rights holders** while facilitating **technological innovation**?
7. What **principles or regulatory mechanisms** may contribute to greater **coherence**, **interoperability**, and **accountability** in the **global governance** of AI and intellectual property?

RESEARCH OBJECTIVES

The principal objectives of the research are:

1. To examine the evolving relationship between **artificial intelligence** and **intellectual property law**, with particular emphasis on **copyright**, **patents**, **authorship**, **inventorship**, and the use of **protected material** for AI development and training.
2. To comparatively analyse the **legal and regulatory frameworks** governing **AI and intellectual property** in the **European Union**, **United States**, **United Kingdom**, **India**, and selected **international frameworks**.
3. To identify and analyse the principal areas of **convergence and divergence** among different jurisdictions concerning **AI-generated works**, **AI-assisted inventions**, **training data**, **licensing**, **copyright exceptions**, **transparency**, and **liability**.
4. To examine the **allocation of legal responsibility and accountability** among the various actors participating in the **AI lifecycle**, including **developers**, **model providers**, **deployers**, **users**, **data providers**, and **rights holders**.
5. To evaluate the effectiveness of emerging **accountability mechanisms**, including **transparency**, **documentation**, **traceability**, **risk assessment**, **human oversight**, **auditing**, **monitoring**, **enforcement**, and **redress mechanisms**.
6. To identify **legal uncertainties** and **regulatory gaps** arising from the **fragmented development of AI-IP laws and policies** across jurisdictions.
7. To examine the challenges associated with **cross-border AI development** and **intellectual property enforcement**, particularly where different jurisdictions adopt substantially different approaches to **copyright**, **licensing**, **liability**, and **AI governance**.
8. To develop **principles** for a more **coherent and interoperable AI-IP accountability framework** capable of balancing **technological innovation** with the protection of **intellectual property rights** and the interests of relevant stakeholder.

RESEARCH METHODOLOGY

1. Nature of the Research

The present study is **qualitative**, **doctrinal**, **comparative**, **analytical**, and **exploratory**. It evaluates **legal rules**, **regulatory frameworks**, **judicial decisions**, **policy instruments**, **international standards**, and **scholarly literature** related to **artificial intelligence (AI)** and **intellectual property (IP)**. The approach is non-empirical, focusing on the content, structure, application, and interplay of relevant legal frameworks rather than on statistical or quantitative testing.

2. Doctrinal Legal Research

A **doctrinal methodology** grounds the research, enabling in-depth analysis of the current legal position at the intersection of AI and IP. Key tasks include identifying, interpreting, and analyzing:

- Statutory provisions and regulations
- Judicial and administrative decisions
- Regulatory materials and authoritative legal sources

Principal doctrinal topics addressed:

- Copyright protection of AI-generated/AI-assisted works
- Human authorship requirements
- AI-assisted and AI-generated inventions
- Patent inventorship
- Use of copyrighted/protected works for AI training
- Text-and-data-mining exceptions
- Licensing and rights reservations
- Transparency and disclosure obligations
- Liability, enforcement, and remedies for rights holders
- Accountability across the AI lifecycle

3. Comparative Legal Research

A **comparative legal methodology** forms the principal analytical component. The study compares selected jurisdictions to identify similarities, differences, gaps, and areas of convergence in AI-IP regulation.

Jurisdictions and frameworks examined:

- **European Union:** AI regulation, copyright/TDM rules, general-purpose AI obligations, transparency, accountability
- **United States:** Copyrightability, fair use, AI training and generated works, patent inventorship, judicial/regulatory developments
- **United Kingdom:** Copyright/AI policy, licensing, transparency, computer-generated works, innovation, accountability mechanisms
- **India:** Copyright/patent law, emerging AI governance, responsible-AI principles, digital regulation, and IP challenges
- **International Frameworks:** Instruments by **WIPO, UNESCO, OECD**, and other relevant international bodies

These jurisdictions are chosen for their diverse legal and regulatory approaches, allowing meaningful comparative analysis.

4. Primary Sources

The study relies on:

- National legislation and regulations
- EU legislative/regulatory instruments
- International conventions and instruments
- Judicial, administrative, and regulatory decisions
- Government reports and consultation documents
- Regulatory guidance and policy documents
- International AI governance instruments

Special focus is given to sources relevant to **copyright, patents, AI regulation, data use, transparency, accountability, and enforcement.**

5. Secondary Sources

Secondary materials include:

- Books and treatises on IP and technology law
- Peer-reviewed journal articles
- Legal commentaries and academic papers
- Reports of international organizations
- Policy papers and institutional studies
- Expert analyses and relevant literature on AI governance and accountability

Secondary sources inform the identification of competing interpretations, theoretical approaches, regulatory developments, and unresolved legal issues.

6. Comparative Analytical Framework

For systematic comparison, the research evaluates each jurisdiction against common parameters:

Comparative Parameter	Issues Examined
AI Training Data	Lawfulness, copyright exceptions, licensing, rights reservations

Copyrightability	Protection of AI-generated/assisted works
Authorship	Human creative contribution
Patent Law	AI-assisted invention and inventorship
Transparency	Disclosure of AI systems and training data
Accountability	Responsibility allocation in the AI lifecycle
Traceability	Documentation, record-keeping, provenance
Human Oversight	Human involvement in consequential AI processes
Liability	Infringement and harmful AI outputs
Enforcement	Judicial/regulatory mechanisms
Remedies	Injunctions, compensation, redress
Cross-Border Issues	Jurisdictional conflicts, international enforcement
Regulatory Coherence	Legal compatibility/interoperability

This framework enables analysis beyond individual laws, showing how regulatory systems address comparable AI-IP issues.

7. Analytical Method

The research employs **comparative doctrinal analysis** in four stages:

1. Identify and interpret relevant legal rules/instruments for each jurisdiction.
2. Compare these rules using the common parameters above.
3. Identify areas of convergence, divergence, ambiguity, and regulatory gaps.
4. Synthesize findings to assess adequacy of current frameworks for AI-IP accountability and propose principles for improved regulatory coherence.

8. Scope of the Study

The research focuses on the **legal relationship between AI and intellectual property**—particularly **copyright and patent law**. Trade secrets, data rights, licensing, and related protections are included where they directly affect AI development and deployment. The analysis centers on selected major jurisdictions and international frameworks, without exhaustive coverage of every national AI-IP regime.

9. Limitations of the Study

Key limitations include:

- The rapidly evolving nature of AI technology and regulatory policy
- Ongoing changes to laws, judicial decisions, administrative approaches, and international standards
- Variations in legal terminology, institutional structures, enforcement, and judicial traditions, which may constrain direct jurisdictional comparison

Thus, the research emphasizes broader regulatory patterns and principles over the direct transplantation of legal rules.

10. Expected Contribution of the Research

This study aims to advance the field of AI and IP law by integrating **substantive IP protection** with **AI accountability mechanisms**. Rather than treating copyright, patent, transparency, liability, and governance as isolated topics, the research examines their interaction across the AI lifecycle.

Expected contributions include:

- Identifying areas of legal convergence and regulatory divergence
- Clarifying mechanisms for enhanced accountability and interoperability
- Providing a comparative foundation for policymaking on responsible AI innovation and effective IP protection

This analysis intends to support future legal and policy developments at the intersection of AI, intellectual property, and accountability.

FINDINGS

Comparative Findings: AI and Intellectual Property Regulation

The intersection of artificial intelligence (AI) and intellectual property (IP) law is experiencing rapid transformation. Comparative analysis reveals both substantial divergence and emerging convergence across jurisdictions.

1. Fragmentation of Global AI-IP Regulation

No uniform global regulatory framework exists for AI and IP. Jurisdictions adopt distinct mixes of IP law, AI-specific legislation, judicial interpretation, and policy guidance:²⁶

- **EU:** Comprehensive AI regulation combined with copyright and data rules.²⁷
- **US:** Reliance on existing copyright/patent doctrines and judicial development.²⁸
- **UK:** Ongoing consultation, licensing, and transparency initiatives.
- **India:** AI governance evolving within wider technology law.²⁹

Key Finding: Significant differences persist in regulating AI training, outputs, authorship, inventorship, liability, and enforcement.

2. Human Contribution Remains Central

- **Copyright:** The US Copyright Office requires sufficient human input for copyright protection; AI-only outputs are not protected.³⁰
- **Patents:** Courts (e.g., *Thaler v. Vidal* US; *Thaler v. Comptroller-General* UK) confirm that inventors must be natural persons.³¹

Key Finding: Current frameworks treat AI as a tool, not an independent legal author or inventor.

3. Major Divergence in AI Training Data Use

- **EU:** Text-and-data-mining (TDM) exceptions via the Digital Single Market Directive.³²
- **US:** Focus on fair use in copyright doctrine.³³
- **UK:** Policy consultations on licensing, transparency, and copyright.³⁴

Key Finding: Jurisdictions use differing legal tools (exceptions, fair use, licenses, contracts) to address similar practices.

4. Copyrightability Remains Human-Centred

- Copyright applies to human-authored segments of AI-assisted works.³⁵ The degree of required human contribution is a key unresolved issue as generative AI advances.

5. Patent Law Faces Human-Agency Challenges

- Patent law still requires a human inventor.³⁶
- AI's growing technical contribution highlights limits of current statutes.

6. Accountability Goes Beyond Infringement

- **EU AI Act:** Introduces risk management, documentation, oversight, and governance requirements.³⁷
- **International Principles:** Emphasize lifecycle accountability and traceability.³⁸

Key Finding: Accountability models now supplement traditional IP remedies by clarifying processes and actors involved.

7. Responsibility Is Distributed in the AI Lifecycle

- Multiple actors—data providers, developers, model providers, deployers, users—share responsibility.

²⁶ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Conversation on Intellectual Property and Artificial Intelligence* (2019–2025)

²⁷ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 Laying Down Harmonised Rules on Artificial Intelligence, 2024 O.J. (L 168) 1

²⁸ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 3: Generative AI Training* (2025)

²⁹ NITI AAYOG, *Responsible AI for All: Approach Document for India, Part 1—Principles for Responsible AI* (2021)

³⁰ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 2: Copyrightability* 1–18 (2025)

³¹ *Thaler v. Vidal*, 43 F.4th 1207, 1210–13 (Fed. Cir. 2022)

Thaler v. Comptroller-General of Patents, Designs and Trade Marks, [2023] UKSC 49, [1]–[5]

³² 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, 2019 O.J. (L 130) 92, arts. 3–4

³³ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 3: Generative AI Training* 1–70 (2025)

³⁴ UK GOVERNMENT, *Copyright and Artificial Intelligence: Consultation Paper* (2024)

³⁵ U.S. COPYRIGHT OFFICE, *Copyright and Artificial Intelligence, Part 2: Copyrightability* 18–35 (2025)

³⁶ *Thaler v. Vidal*, 43 F.4th at 1212–13

Thaler v. Comptroller-General of Patents, Designs and Trade Marks, [2023] UKSC 49, [52]–[57]

³⁷ Regulation (EU) 2024/1689, 2024 O.J. (L 168) 1, arts. 9, 12, 13, 14 & 53

³⁸ OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024)

- **OECD AI Principles** and the **EU AI Act** differentiate obligations by role and context.³⁹

8. Transparency as an Accountability Mechanism

- Transparency about training, documentation, and system development is increasingly mandatory (e.g., EU AI Act).⁴⁰
- **WIPO** highlights the need for transparency in global policy debates.⁴¹

Key Finding: Transparency is essential for rights enforcement and identifying use of protected works.

9. Complementarity of Accountability and IP Protection

- AI accountability (traceability, documentation, oversight) enhances—not replaces—copyright and patent protections.
- **UNESCO** links transparency and explainability with accountability and human oversight.⁴²

10. Uneven Enforcement and Remedies

- Remedies vary: litigation, administrative processes, contracts, licensing, regulatory complaints.
- Cross-border AI complicates jurisdiction, applicable law, and enforcement.
- **WIPO** recognizes international challenges and the need for ongoing dialogue.⁴³

11. International Principles Show Greater Convergence

- **OECD** and **UNESCO** promote common governance values: transparency, accountability, human-centredness, and rights protection.⁴⁴
- National law remains fragmented, but international standards foster conceptual alignment.

12. Emerging Economies Face Unique Challenges

- Countries like India must foster innovation, protect creators, build capacity, and engage globally.
- India's Responsible AI framework highlights safety, equality, privacy, and accountability.⁴⁵

13. The Need for Regulatory Interoperability

- Full legal uniformity is unlikely, but greater interoperability can reduce uncertainty and facilitate cross-border enforcement.
- Common principles: responsible actor identification, documentation, transparency, human contribution, risk-based accountability, rights-holder remedies, international cooperation.⁴⁶

14. Consolidated Finding

The principal challenge in global AI-IP regulation is not the lack of IP law, but the application of human-centred IP principles to distributed, networked AI ecosystems. The trend is toward a “rights-plus-accountability” model: traditional copyright and patent rights remain fundamental, but are complemented by transparency, traceability, oversight, and effective remedies throughout the AI lifecycle.⁴⁷

Conclusion: The emerging regulatory environment is marked by diversity but increasing convergence around accountability. The chief legal task is to enhance coherence and enforceability globally, while respecting jurisdictional distinctiveness and supporting responsible innovation.

Comparative Parameter	European Union	United States	United Kingdom	India	International Frameworks
Primary Regulatory	Comprehensive, risk-	Sectoral, tech-specific	Flexible, principles-based	Developing, innovation-	Soft-law, coordination

³⁹ Regulation (EU) 2024/1689, 2024 O.J. (L 168) 1, arts. 25–27

⁴⁰ Id. arts. 50 & 53

⁴¹ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *Generative Artificial Intelligence and Intellectual Property* (2024)

⁴² UNESCO, *Recommendation on the Ethics of Artificial Intelligence* 12–15 (2021)

⁴³ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Conversation on Intellectual Property and Artificial Intelligence* (2019–2025)

⁴⁴ OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024)

UNESCO, *Recommendation on the Ethics of Artificial Intelligence* 10–18 (2021)

⁴⁵ NITI AAYOG, *Responsible AI for All: Approach Document for India, Part 1—Principles for Responsible AI* 18–35 (2021)

⁴⁶ WORLD INTELLECTUAL PROPERTY ORGANIZATION, *WIPO Conversation on Intellectual Property and Artificial Intelligence* (2019–2025)

⁴⁷ Regulation (EU) 2024/1689, 2024 O.J. (L 168) 1; OECD, *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (2024)

Approach	based AI regulation integrated with IP/data law	regulation; copyright/patent central	governance with existing IP law	focused with IP/IT law	(WIPO, OECD, UNESCO)
Principal Regulatory Instrument	EU AI Act, Regulation (EU) 2024/1689	No comprehensive AI statute; sectoral/copyright/patent frameworks	Regulator/principles-based framework	No AI Act; policy supplements existing law	OECD AI Principles, UNESCO, WIPO
Copyright Protection for AI Outputs	Human authorship required	Human authorship central	Human creativity central	Human-author centered	No universal rule
AI Training and Copyright	TDM exceptions + AI Act transparency & compliance	Fair use doctrine central, ongoing litigation	Exceptions/licensing policy developing	Uncertainty with copyright for AI training	Major area of divergence
Text and Data Mining (TDM)	Specific TDM framework	No general statutory exception; fair use may apply	Specific exceptions; AI-training application contested	No AI-specific TDM exception	No uniform standard
AI Authorship	Human intellectual contribution required	Human authorship required	Human authorship fundamental	Human contribution central	No uniform rule
AI Inventorship	Human inventor required (per patent law)	Human inventor required (Thaler v. Vidal)	Human inventor required (Thaler v. Comptroller-General)	Human inventorship focused	Human-centred patent systems
Transparency	Extensive obligations for AI systems and GPAI models	Varies by sector and legal context	Addressed via principles and sectoral regulation	Emerging governance requirement	Promoted by OECD/UNESCO
Explainability	Risk-dependent, esp. for high-risk systems	No single federal requirement	Principles-based approach	Developing in policy	International responsible-AI principle
Human Oversight	Explicit for high-risk AI	Sectoral/organizational mechanisms	Principles-based framework	Emphasized in Responsible-AI initiatives	Widely recognized
Traceability/Documentation	Strong requirements for regulated systems	Context/sector/litigation-dependent	Addressed by principles and sectoral mechanisms	Developing regulatory expectation	Responsible-AI governance standards
Risk Classification	Detailed statutory risk categories	No unified federal classification	Cross-sector principles	No comprehensive statutory framework	Risk-based governance promoted
AI Lifecycle Accountability	Strong lifecycle-oriented approach	Responsibility distributed via existing doctrines	Responsibility distributed among regulators/actors	Developing	Increasingly promoted principle

Developer/Provider Responsibility	Defined by AI-system category	Determined by copyright, product, sectoral law	Applied contextually by regulators	Emerging via policy/existing law	Responsible development promoted
Deployer/User Responsibility	Explicit for high-risk AI	Context-dependent	Sector-specific	Developing	Human responsibility recognized
Copyright Compliance Documentation	Developed for GPAI models	Addressed by law, litigation, licensing	Under policy development	Not codified	WIPO transparency/licensing focus
Accountability Mechanisms	Risk management, documentation, oversight, conformity, enforcement	Litigation, admin enforcement, copyright remedies, sectoral oversight	Impact assessment, existing regulators, accountability mechanisms	Courts, regulators, IP remedies, emerging AI mechanisms	Standards & voluntary governance
Audit/Monitoring	Formal compliance and monitoring mechanisms	Sectoral/organization-specific	Regulatory/organizational monitoring	Developing	Promoted as good governance practice
Liability Approach	Linked to AI-system risk and regulatory obligations	Existing legal doctrines, sectoral rules	Existing legal/regulatory mechanisms	Statutory/common law + emerging policy	No uniform regime
Enforcement	Centralized & Member-State enforcement (AI Act)	Federal, state, and judicial enforcement	Regulatory institutions	Courts, regulatory institutions	Coordination, soft-law
Remedies for IP Infringement	Copyright/patent remedies + AI compliance obligations	Established copyright/patent remedies	Established copyright/patent remedies	Established Indian IP remedies	Domestic law dependent
Regulatory Model	Risk-based, lifecycle-oriented	Sectoral, litigation-oriented	Principles-based, regulator-led	Developing, policy-oriented	Principles & coordination
Principal Accountability Focus	Prevention, transparency, documentation, oversight, compliance	Rights enforcement, litigation, sectoral oversight	Responsible innovation, transparency, regulator accountability	Innovation, IP protection, emerging governance	Human rights, responsible AI, cooperation
Major Regulatory Challenge	Coordinating AI regulation, copyright, innovation, rights	Fragmentation (federal, state, sectoral)	Balancing flexibility/certainty	No comprehensive AI-specific law	Lack of binding harmonization
Overall Model Relevant to Study	Integrated AI + IP + accountability	IP + litigation + sectoral accountability	Principles + existing-law accountability	Existing IP law + emerging AI governance model	Principles + coordination

Core Comparative Finding

The principal distinction among the jurisdictions is **not simply whether AI is regulated**, but **how responsibility is allocated across the AI lifecycle**. The EU model places comparatively greater emphasis on statutory risk classification, documentation, transparency, human oversight and compliance; the US relies more heavily on existing IP doctrines, litigation and sector-specific regulation; the UK employs a principles-based and regulator-led approach; India is developing an AI-governance framework while relying substantially on existing legal regimes; and international institutions primarily provide principles and coordination mechanisms.

This comparative structure directly supports the research theme of “**Comparative Analysis of Global AI-IP Regulations and Accountability Models**” because it brings **IP protection and AI accountability into the same analytical framework**, rather than examining copyright or patent law independently.

CONCLUSION

Conclusion: Towards Lifecycle-Based AI-IP Accountability

- **Traditional IP frameworks** (copyright, patent law) were designed for identifiable human creators and individual acts of infringement. Modern **AI systems** involve multiple actors and interconnected stages—**data collection, training, model development, deployment, and generation**—making authorship, inventorship, ownership, and liability more complex.
- **No uniform global approach** exists.
 - The **EU** leads with a comprehensive, risk-based framework emphasizing **transparency, documentation, human oversight, and accountability**.⁴⁸
 - The **US** relies on existing doctrines, judicial decisions, licensing, and sectoral regulation.
 - The **UK** adopts a flexible, principles-based, regulator-led model.
 - **India’s** framework is developing alongside existing IP and IT laws.
- **IP protection alone is insufficient** for AI accountability. Copyright and patent remedies address specific infringements but do not cover all risks across the AI lifecycle. **Complementary mechanisms**—such as risk assessment, transparency, traceability, human oversight, auditing, monitoring, and accessible redress—are necessary for robust governance.⁴⁹
- **Global fragmentation** in approaches to **AI training, TDM, copyrightability, authorship, inventorship, licensing, and liability** leads to uncertainty for all stakeholders. However, international efforts increasingly converge around common principles: **transparency, accountability, human oversight, and responsible AI**.⁵⁰
- The research **supports a lifecycle-based accountability approach**:
 - **Responsibility is allocated** by function (developer, provider, deployer, etc.), not replaced by new law.
 - **AI-specific accountability mechanisms** should **complement**, not substitute, copyright and patent protection.
- **Effective regulation** must balance **innovation, IP protection, human rights, legal certainty, and accountability**.
 - **Harmonisation** need not mean identical laws, but **greater interoperability**—through shared principles on training data, human contribution, transparency, traceability, oversight, liability, and remedies—can enhance consistency while preserving national autonomy.⁵¹
- **Principal contribution**:
 - Reframing AI-IP regulation as a question of **responsibility allocation**—who, when, under what law, and through which mechanisms—rather than simply infringement.
 - A **sustainable global framework** will move beyond an infringement-centered model toward a **preventive, transparent, traceable, and lifecycle-based accountability approach**.

⁴⁸ Regulation (EU) 2024/1689 (Artificial Intelligence Act), arts. 9–14, 50–53

⁴⁹ Organisation for Economic Co-operation and Development, *OECD AI Principles* (2019, updated 2024)

⁵⁰ UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (2021); World Intellectual Property Organization, *WIPO Conversation on Intellectual Property and Frontier Technologies*

⁵¹ Id.; OECD AI Principles, *supra* note 2

BIBLIOGRAPHY

- [1] Ryan Abbott, *The Reasonable Robot: Artificial Intelligence and the Law* (Cambridge University Press 2020).
- [2] Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. Pitt. L. Rev. 1185 (1986).
- [3] Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. Rev. 1079 (2016).
- [4] Ana Ramalho, *Will Robots Rule the (Artistic) World? A Legal Analysis of the Ownership of Works Created by Artificial Intelligence*, 21 J. Internet L. 12 (2017).
- [5] Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors Are Already Here—A New Model*, 2017 Mich. St. L. Rev. 659 (2017).
- [6] Daniel J. Gervais, *The Machine as Author*, 105 Iowa L. Rev. 2053 (2020).
- [7] Mark A. Lemley & Bryan Casey, *Fair Learning*, 99 Tex. L. Rev. 743 (2021).
- [8] Mark A. Lemley, *How Generative AI Turns Copyright Law Upside Down*, 25 Stan. Tech. L. Rev. 1 (2024).
- [9] Katharina de la Durantaye, *Control and Compensation: A Comparative Analysis of Copyright Exceptions for Training Generative AI*, *International Review of Intellectual Property and Competition Law* (2025).
- [10] Shinu Vig, *Intersection of Generative Artificial Intelligence and Copyright: An Indian Perspective*, 17 J. Sci. & Tech. Pol'y Mgmt. 118 (2026).
- [11] *Thaler v. Vidal*, 43 F.4th 1207 (Fed. Cir. 2022).
- [12] *Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, [2023] UKSC 49.
- [13] *Feist Publications, Inc. v. Rural Telephone Service Co.*, 499 U.S. 340 (1991).
- [14] *Authors Guild v. Google, Inc.*, 804 F.3d 202 (2d Cir. 2015).
- [15] World Intellectual Property Organization, *WIPO Conversation on Intellectual Property and Frontier Technologies: Generative Artificial Intelligence* (2024).
- [16] Organisation for Economic Co-operation and Development, *Recommendation of the Council on Artificial Intelligence* (OECD AI Principles) (2019, updated 2024).
- [17] UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (2021).
- [18] European Union, Regulation (EU) 2024/1689, *Artificial Intelligence Act*.
- [19] European Union, Directive (EU) 2019/790 on Copyright and Related Rights in the Digital Single Market.
- [20] United States Copyright Office, *Copyright and Artificial Intelligence, Part 2: Copyrightability* (2025).
- [21] United States Copyright Office, *Copyright and Artificial Intelligence, Part 3: Generative AI Training* (2025).
- [22] UK Intellectual Property Office, *Copyright and Artificial Intelligence* consultation and related government materials.
- [23] NITI Aayog, *Responsible AI for All: Approach Document for India* (2021).
- [24] Government of India, *Copyright Act, 1957*.
- [25] Government of India, *Patents Act, 1970*.