

The background of the journal cover features a top-down view of a desk. On the left, a pair of black leather brogue shoes is partially visible. In the center, an open notebook with lined pages and a silver pen lies on a light-colored wooden surface. To the right, a black leather bag with a zipper and a black leather watch with a silver face are also visible. A large, semi-transparent white rectangular box is centered over the image, containing the journal's title and ISSN information.

INTERNATIONAL LAW
JOURNAL

**WHITE BLACK
LEGAL LAW
JOURNAL**
**ISSN: 2581-
8503**

Peer - Reviewed & Refereed Journal

The Law Journal strives to provide a platform for discussion of International as well as National Developments in the Field of Law.

WWW.WHITEBLACKLEGAL.CO.IN

DISCLAIMER

No part of this publication may be reproduced, stored, transmitted, translated, or distributed in any form or by any means—whether electronic, mechanical, photocopying, recording, scanning, or otherwise—without the prior written permission of the Editor-in-Chief of *White Black Legal – The Law Journal*.

All copyrights in the articles published in this journal vest with *White Black Legal – The Law Journal*, unless otherwise expressly stated. Authors are solely responsible for the originality, authenticity, accuracy, and legality of the content submitted and published.

The views, opinions, interpretations, and conclusions expressed in the articles are exclusively those of the respective authors. They do not represent or reflect the views of the Editorial Board, Editors, Reviewers, Advisors, Publisher, or Management of *White Black Legal*.

While reasonable efforts are made to ensure academic quality and accuracy through editorial and peer-review processes, *White Black Legal* makes no representations or warranties, express or implied, regarding the completeness, accuracy, reliability, or suitability of the content published. The journal shall not be liable for any errors, omissions, inaccuracies, or consequences arising from the use, interpretation, or reliance upon the information contained in this publication.

The content published in this journal is intended solely for academic and informational purposes and shall not be construed as legal advice, professional advice, or legal opinion. *White Black Legal* expressly disclaims all liability for any loss, damage, claim, or legal consequence arising directly or indirectly from the use of any material published herein.

ABOUT WHITE BLACK LEGAL

White Black Legal – The Law Journal is an open-access, peer-reviewed, and refereed legal journal established to provide a scholarly platform for the examination and discussion of contemporary legal issues. The journal is dedicated to encouraging rigorous legal research, critical analysis, and informed academic discourse across diverse fields of law.

The journal invites contributions from law students, researchers, academicians, legal practitioners, and policy scholars. By facilitating engagement between emerging scholars and experienced legal professionals, *White Black Legal* seeks to bridge theoretical legal research with practical, institutional, and societal perspectives.

In a rapidly evolving social, economic, and technological environment, the journal endeavours to examine the changing role of law and its impact on governance, justice systems, and society. *White Black Legal* remains committed to academic integrity, ethical research practices, and the dissemination of accessible legal scholarship to a global readership.

AIM & SCOPE

The aim of *White Black Legal – The Law Journal* is to promote excellence in legal research and to provide a credible academic forum for the analysis, discussion, and advancement of contemporary legal issues. The journal encourages original, analytical, and well-researched contributions that add substantive value to legal scholarship.

The journal publishes scholarly works examining doctrinal, theoretical, empirical, and interdisciplinary perspectives of law. Submissions are welcomed from academicians, legal professionals, researchers, scholars, and students who demonstrate intellectual rigour, analytical clarity, and relevance to current legal and policy developments.

The scope of the journal includes, but is not limited to:

- Constitutional and Administrative Law
- Criminal Law and Criminal Justice
- Corporate, Commercial, and Business Laws
- Intellectual Property and Technology Law
- International Law and Human Rights
- Environmental and Sustainable Development Law
- Cyber Law, Artificial Intelligence, and Emerging Technologies
- Family Law, Labour Law, and Social Justice Studies

The journal accepts original research articles, case comments, legislative and policy analyses, book reviews, and interdisciplinary studies addressing legal issues at national and international levels. All submissions are subject to a rigorous double-blind peer-review process to ensure academic quality, originality, and relevance.

Through its publications, *White Black Legal – The Law Journal* seeks to foster critical legal thinking and contribute to the development of law as an instrument of justice, governance, and social progress, while expressly disclaiming responsibility for the application or misuse of published content.

**“PATENTABILITY OF ARTIFICIAL INTELLIGENCE-
GENERATED INVENTIONS IN INDIA: LEGAL
CHALLENGES AND IMPLICATIONS”**

AUTHORED BY - G.GAAYATHRI

LL.B

Department of Legal Studies, School of Law

Vels Institute Of Science Technology And Advanced Studies Chennai

CO-AUTHOR - MRS.DIVYA.R

Assistant Professor

Department of Legal Studies, School of Law

Vels Institute Of Science Technology And Advanced Studies Chennai

CERTIFICATE FROM THE DEAN

I certify that the Research work entitled “**PATENTABILITY OF ARTIFICIAL INTELLIGENCE-GENERATED INVENTIONS IN INDIA: LEGAL CHALLENGES AND IMPLICATIONS**” submitted for the degree of **LL.B** by **G.GAAYATHRI**, (Reg No 23122806) is the record of research work carried out by him/her under the guidance of **MRS.DIVYA.R** has not formed the basis or the award of Degree, Diploma, Associateship, Fellowship, Titles in this University or any other similar University and institutions of Higher Learning.

Place: chennai

Date:

Signature of the Dean

MRS.DIVYA.R

Assistant Professor

School of Law, VISTAS, Chennai.

CERTIFICATE FROM THE SUPERVISOR

I certify that the Project work entitled “**PATENTABILITY OF ARTIFICIAL INTELLIGENCE-GENERATED INVENTIONS IN INDIA: LEGAL CHALLENGES AND IMPLICATIONS**” submitted for the degree of **LL.B** by **G.GAAYATHRI**, (Reg No 23122806) is the record of research work carried out by him/her under my guidance has not formed the basis or the award of Degree, Diploma, Associateship, Fellowship, Titles in this University or any other similar University and institutions of Higher Learning.

Place:chennai

Date:

Signature of the Supervisor

DECLARATION

I declare that the research work entitled “**PATENTABILITY OF ARTIFICIAL INTELLIGENCE-GENERATED INVENTIONS IN INDIA: LEGAL CHALLENGES AND IMPLICATIONS**” submitted by me for the degree of **LL.B** is the record of work carried out by me under the guidance of **MRS.DIVYA.R** has not formed the basis or the award of any Degree, Diploma, Associateship, Fellowship, Titles in this university or any other similar University institutions of Higher Learning.

Place: Chennai

Date:

Signature of the Candidate

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the Dean, School of Law, Mrs. Ambika Kumari, for providing me with the opportunity to undertake this research project and for her continuous encouragement and academic support.

I am deeply indebted to the Heads of the Department for their valuable guidance and support throughout the course of my study.

I extend my heartfelt thanks to my project guide, Mrs. Divya Rajan, for her invaluable guidance, constant encouragement, and insightful suggestions, which have greatly contributed to the successful completion of this research. Her expertise and mentorship have been instrumental in shaping the quality and direction of this work.

I would like to acknowledge the institution for providing the essential resources and facilities required for the completion of this research.

Finally, this research work stands as a result of the collective support and guidance received, and I am sincerely thankful to everyone who has contributed to its successful completion.

TABLE OF CASES

Bayer Corporation v Union of India (2014) 6 SCC 590

Biswanath Prasad Radhey Shyam v Hindustan Metal Industries (1982) 1 SCC 511

Commissioner of Patents v Thaler [2022] FCAFC 62

F Hoffmann-La Roche Ltd v Cipla Ltd (2015) 225 DLT 391 (Delhi HC)

Ferid Allani v Union of India 2019 SCC OnLine Del 11867

Novartis AG v Union of India (2013) 6 SCC 1

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

Thaler v Vidal 43 F 4th 1207 (Fed Cir 2022)

LIST OF ABBREVIATIONS

AI – Artificial Intelligence

CNIPA – China National Intellectual Property Administration

CRIs – Computer Related Inventions

DLT – Delhi Law Times

EPO – European Patent Office

Fed Cir – Federal Circuit (United States Court of Appeals)

IP – Intellectual Property

SCC – Supreme Court Cases

TRIPS – Trade-Related Aspects of Intellectual Property Rights

UKSC – United Kingdom Supreme Court

USPTO – United States Patent and Trademark Office

WIPO – World Intellectual Property Organization

Abstract

Artificial intelligence (AI) is rapidly reshaping the landscape of innovation by enabling machines to autonomously generate technical solutions and inventive outputs that were once exclusively attributable to human creativity. This evolution presents significant conceptual and legal challenges for patent systems that are grounded in traditional notions of human inventorship. In India, the Patents Act, 1970 does not specifically address inventions created by AI systems, leaving an important gap in legal recognition. The current statutory framework requires a natural person to be named as an inventor, a requirement that is at odds with the autonomous nature of some AI-generated innovations. This research critically examines the patentability of AI-generated inventions under Indian law, analyzing key statutory provisions such as Section 3(k) — which excludes algorithms and computer programs per se from patentability — and broader criteria like novelty, inventive step, and disclosure requirements, including challenges posed by opaque “black-box” AI models. Drawing on comparative perspectives from the United States, European Union, United Kingdom, China, Australia, and South Africa, the study identifies global trends and judicial approaches, including high-profile cases where courts reaffirmed that only human inventors may be legally recognized.

The research finds that, while AI can assist or contribute to inventive processes, existing legal doctrines struggle to accommodate inventions that arise with minimal human intervention. This tension results in uncertainty regarding inventorship attribution, patent ownership, and compliance with disclosure standards, which in turn may impede the protection of AI-driven inventions and discourage innovation. The paper argues that India must adopt a balanced approach that preserves core patent principles while adapting to technological developments. To this end, it proposes targeted legislative reforms, clear Patent Office guidelines, and institutional engagement to provide clarity on inventorship criteria, technical contribution requirements, and appropriate mechanisms for acknowledging AI’s role in innovation without granting legal personhood to AI systems. The study concludes that a nuanced legal framework that embraces the realities of AI-assisted innovation will support India’s technological and economic objectives while maintaining legal certainty and public interest.

Introduction

Overview of the study

This research critically examines the intersection between artificial intelligence (AI) and patent law, with particular focus on the Indian legal framework. The study is situated within the

broader context of rapid technological advancement, where AI systems are increasingly capable of generating innovative outputs that challenge traditional understandings of invention and inventorship. Unlike conventional tools, modern AI technologies can autonomously analyse data, identify patterns, and produce technical solutions, thereby raising complex legal and conceptual issues for patent systems that have historically been grounded in human creativity.¹The primary objective of this research is to evaluate the extent to which the existing framework under the Patents Act, 1970 is capable of addressing the patentability of AI-generated inventions. While the Act establishes clear criteria such as novelty, inventive step, and industrial applicability, it does not explicitly address inventions produced through artificial intelligence. This absence of clarity creates uncertainty regarding fundamental aspects of patent law, including the identification of the inventor, allocation of ownership, and the applicability of traditional standards of patentability to machine-generated outputs.²A central concern of the study is the concept of inventorship, which under current legal principles is closely associated with human intellectual contribution.³The research further examines the challenges associated with applying traditional patentability criteria to AI-generated inventions. The requirement of an inventive step, typically assessed from the perspective of a “person skilled in the art,” is based on human reasoning and may not adequately capture the capabilities of AI systems. Similarly, the requirement of disclosure presents difficulties in the context of complex AI models, especially where the internal functioning of such systems is not fully transparent.⁴Methodologically, the study adopts a doctrinal approach, relying on statutory analysis, judicial decisions, and patent office practices within India. This is complemented by a comparative analysis of international developments in jurisdictions such as the United States, the United Kingdom, the European Union, China, Australia, and South Africa. This comparative perspective highlights a global trend towards recognizing AI-assisted inventions while maintaining the requirement of human inventorship.⁵ In conclusion, the study argues that although the Indian patent system provides a strong foundation for protecting innovation, it requires careful adaptation to address the challenges posed by artificial intelligence. Such an approach would enhance legal certainty, promote innovation, and ensure that the patent system remains responsive to the evolving nature of technological development.¹

-
1. ¹ World Intellectual Property Organization, *WIPO Technology Trends 2019: Artificial Intelligence* (WIPO 2019).
 2. Patents Act 1970, ss 2(1)(j), 2(1)(ja), 3(k) (India).
 3. Ryan Abbott, *The Reasonable Robot: Artificial Intelligence and the Law* (CUP 2020).
 4. Biswanath Prasad Radhey Shyam v Hindustan Metal Industries AIR 1982 SC 1444; F Hoffmann-Lar Roche Ltd v Cipla Ltd (2010) 42 PTC 125 (Del).
 5. Thaler v Vidal 43 F 4th 1207; Thaler v Comptroller-General of Patents [2023] UKSC 49.

Need of the study

The rapid advancement of artificial intelligence (AI) has significantly transformed the landscape of innovation, thereby challenging the foundational assumptions of traditional patent law. The Indian patent regime, governed by the Patents Act, 1970, is premised on the notion that inventions are the result of human intellect and creativity. However, the emergence of AI systems capable of autonomously generating novel and useful outputs has disrupted this conventional understanding. As a result, there is an urgent need to examine whether the existing legal framework is adequately equipped to address the complexities associated with AI-generated inventions. While the Act provides established criteria for patentability, such as novelty, inventive step, and industrial applicability, it does not clarify how these standards apply when inventions are created through artificial intelligence. This lack of statutory clarity creates uncertainty for inventors, patent examiners, and policymakers, thereby affecting the consistency and predictability of patent protection. The issue of inventorship further underscores the importance of this study. Under the current legal framework, inventorship is attributed to natural persons who contribute intellectually to the invention. This issue has gained global attention, particularly in cases such as *Thaler v Vidal* (2022) and *Thaler v Comptroller-General of Patents* (2023), where courts reaffirmed the principle that only natural persons can be recognized as inventors. AI-driven innovation often involves multiple stakeholders, including developers, programmers, data providers, and end-users. In the absence of clear legal guidelines, determining ownership of AI-generated inventions becomes complex and may give rise to disputes. Such ambiguity can undermine confidence in the patent system and potentially discourage innovation and investment. The study is also essential in addressing the limitations of traditional patentability criteria when applied to AI-generated inventions. The concept of an inventive step is evaluated from the perspective of a “person skilled in the art,” which is inherently based on human reasoning. This raises questions about its applicability to inventions generated through machine learning processes. Furthermore, disclosure requirements may be difficult to satisfy in cases involving complex AI systems, particularly those operating as “black boxes,” where the decision-making process is not easily explainable. From a policy perspective, this study is necessary to ensure that the patent system continues to promote innovation while safeguarding public interest. Artificial intelligence has the potential to drive economic growth, enhance technological capabilities, and foster industrial development in India. Finally, this study contributes to the broader global discourse on artificial

6. *Novartis AG v Union of India* (2013) 6 SCC 1.

intelligence and intellectual property law. As countries around the world grapple with similar challenges, a comparative understanding of international approaches can provide valuable insights for India. By identifying legal gaps and proposing necessary reforms, this research aims to support the development of a patent system that is both adaptive and responsive to technological change. In conclusion, the need for this study arises from the growing mismatch between existing patent law principles and the realities of AI-driven innovation. Addressing these challenges is essential to ensure legal certainty, encourage innovation, and maintain the relevance of the patent system in the era of artificial intelligence.²

Significance of the study

This study assumes considerable significance in the contemporary legal and technological context, as it addresses the complex challenges posed by artificial intelligence (AI) to traditional patent law. With AI increasingly contributing to innovation processes, the research highlights the need to reassess existing legal frameworks, particularly under the Patents Act, 1970, to ensure their continued relevance. By focusing on AI-generated inventions, the study contributes to bridging the gap between technological advancements and the legal principles governing intellectual property.¹ **Theoretical approach** of this study lies in its critical re-evaluation of foundational concepts of patent law, including inventorship, inventive step, and disclosure. Traditional patent systems are grounded in the assumption of human creativity; however, AI challenges this premise by introducing the possibility of autonomous invention. This study contributes to academic discourse by examining whether existing legal definitions can accommodate such developments or require reinterpretation.² From a **practical perspective**, the study is highly relevant for policymakers, legal practitioners, and patent authorities. It identifies key areas of legal uncertainty, particularly in relation to inventorship and ownership of AI-generated inventions. By analysing judicial developments such as *Thaler v Vidal* and *Thaler v Comptroller-General of Patents*, the research provides valuable insights into how courts have addressed the issue of AI inventorship.³ These insights can assist in shaping informed and consistent policy responses within the Indian legal framework. The study also holds **economic and policy significance**, as artificial intelligence plays a crucial role in driving innovation, industrial growth, and technological advancement. A clear and predictable patent regime is essential to encourage investment in AI-related research and development. At

² World Intellectual Property Organization, *WIPO Technology Trends 2019: Artificial Intelligence* (WIPO 2019). Patents Act 1970, ss 2(1)(j), 2(1)(ja), 3(k) (India).
Thaler v Vidal 43 F 4th 1207; *Thaler v Comptroller-General of Patents* [2023] UKSC 49.

the same time, the study emphasises the importance of maintaining a balance between innovation and public interest, as reflected in *Novartis AG v Union of India*.⁴ Ensuring such balance is vital to prevent monopolisation while promoting access to technology. Furthermore, the research contributes to the **comparative and global discourse** on AI and intellectual property law. By examining approaches adopted in different jurisdictions, it identifies global trends and best practices that may guide reforms in India. This comparative analysis enhances the relevance of the study and provides a broader perspective on how legal systems are adapting to emerging technologies.⁵ Finally, the study has **academic significance**, as it adds to the relatively limited body of literature on AI and patent law in India. It provides a structured and analytical framework for understanding the legal implications of AI-generated inventions, thereby serving as a useful resource for future research and scholarly engagement in this evolving field. In conclusion, the significance of this study lies in its contribution to legal theory, policy development, and academic research. It seeks to facilitate a balanced and adaptive approach to patent law, ensuring that it remains responsive to the challenges and opportunities presented by artificial intelligence.³

Background of the Study

Artificial Intelligence has emerged as a transformative technology that is increasingly capable of performing complex tasks traditionally associated with human intellect. Modern AI systems are not only assisting human inventors but, in certain instances, are independently producing solutions and innovative outputs. These developments raise important questions for patent technical law, which has long been based on the assumption that inventions originate from human creativity.

Historically, patent law has been premised on the assumption that inventions are the product of human intellect and creativity. The concept of is closely linked to human mental effort, intention, and ingenuity. Moreover, the increasing integration of AI across industries such as pharmaceuticals, biotechnology, and engineering has intensified the need for legal clarity. As AI systems become more autonomous, the distinction between human-assisted and machine-generated inventions becomes increasingly blurred. This raises critical questions regarding inventorship, ownership, and the applicability of traditional patent principles to emerging

³ □ World Intellectual Property Organization, *WIPO Technology Trends 2019: Artificial Intelligence* (WIPO 2019). □ Ryan Abbott, *The Reasonable Robot: Artificial Intelligence and the Law* (CUP 2020).

□ *Thaler v Vidal* 43 F 4th 1207; *Thaler v Comptroller-General of Patents* [2023] UKSC 49.

□ *Novartis AG v Union of India* (2013) 6 SCC 1.

□ European Patent Office, *Artificial Intelligence and Patents* (EPO 2020).

technologies.

Indian judicial decisions further reinforce the human-centric nature of patent law. In *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, the Supreme Court emphasized that an invention must involve a technical advancement that is not obvious to a person skilled in the art, thereby linking inventiveness to human reasoning.¹ Similarly, in *Novartis AG v Union of India*, the Court underscored the importance of maintaining a balance between innovation and public interest, highlighting that patent law should not be applied in a manner that leads to unjustified monopolies.² These decisions indicate that Indian patent jurisprudence continues to rely heavily on traditional notions of human ingenuity and public welfare. At the same time, developments in computer-related inventions (CRIs) demonstrate the evolving nature of patent law in response to technological advancements. In *Ferid Allani v Union of India*, the Delhi High Court recognized that inventions involving computer programs may be patentable if they produce a technical effect or technical contribution.³ This judgment reflects a progressive approach towards accommodating emerging technologies within the existing legal framework. In conclusion, the rapid advancement of artificial intelligence has exposed fundamental limitations in the traditional patent law framework, particularly in relation to inventorship and patentability. The absence of explicit legal provisions addressing AI-generated inventions in India creates uncertainty and may hinder innovation and investment in emerging technologies. There is, therefore, an urgent need to re-examine and adapt the existing legal framework to ensure that it remains relevant, effective, and aligned with the evolving nature of technological innovation.⁴

Importance of Artificial Intelligence in Innovation

Artificial Intelligence plays a vital role in accelerating innovation by enhancing research efficiency, optimizing design processes, and enabling the discovery of novel solutions across various sectors. Industries such as healthcare, information technology, manufacturing, and pharmaceuticals increasingly rely on AI-driven systems to generate innovative outcomes that may not have been possible through human effort alone.

From an economic perspective, the importance of AI is particularly significant for a developing country like India. The adoption of AI technologies has the potential to promote industrial

1. ⁴ *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.

2. *Novartis AG v Union of India* (2013) 6 SCC 1.

3. *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.

growth, enhance productivity, and strengthen technological self-reliance. By fostering innovation across sectors, AI can contribute to India's global competitiveness and support its transition towards a knowledge-based economy. International studies, including those by the World Intellectual Property Organization, have highlighted the growing impact of AI on global innovation trends.¹

However, despite its transformative potential, the absence of a clear legal framework governing the protection of AI-generated inventions poses a significant challenge. The existing patent regime under the Patents Act, 1970 does not explicitly address the role of AI in the inventive process, leading to uncertainty among innovators and investors. This lack of clarity may discourage investment in AI-driven research and hinder the effective commercialisation of innovations.

Furthermore, Indian courts have recognised the importance of promoting genuine innovation while maintaining public interest. In *Novartis AG v Union of India*, the Supreme Court emphasised that patent protection should encourage real technological advancement rather than mere incremental changes.² This principle is equally relevant in the context of AI, where the law must strike a balance between incentivising innovation and preventing undue monopolisation. For a developing economy like India, AI has the potential to support economic growth, technological self-reliance, and global competitiveness. However, the absence of legal clarity regarding the protection of AI-generated inventions may discourage innovators and investors. An effective patent framework that accommodates AI-driven innovation is therefore essential to ensure continued technological progress.

In conclusion, artificial intelligence plays a pivotal role in shaping the future of innovation by enabling faster, more efficient, and more sophisticated problem-solving capabilities. To fully harness its potential, it is essential to develop a patent framework that recognises and accommodates AI-driven inventions while maintaining the core principles of patent law.⁵

Research Problem

The rapid advancement of artificial intelligence (AI) has fundamentally altered the nature of innovation, enabling machines to generate novel and technically significant outputs with minimal or no direct human intervention. However, the existing patent law framework in India,

- ⁵ World Intellectual Property Organization, *Technology Trends: Artificial Intelligence* (2019).
- Novartis AG v Union of India* (2013) 6 SCC 1.
- Patents Act, 1970*.

as embodied in the Patents Act, 1970, is premised on the traditional assumption that inventions are the result of human intellectual effort. This human-centric foundation creates a significant legal gap when applied to AI-generated inventions. The core research problem addressed in this study is the absence of a clear and comprehensive legal framework in India to determine the patentability of inventions generated through artificial intelligence. While the Act lays down general criteria such as novelty, inventive step, and industrial applicability, it does not provide specific guidance on how these standards should be interpreted in the context of AI-driven innovation. This lack of clarity results in doctrinal uncertainty and practical challenges for inventors, patent examiners, and policymakers.

The primary issue addressed in this study is the lack of a clearly defined legal framework in India for determining the patentability of AI-generated inventions. While the Patents Act, 1970 sets out the general criteria for patentability, it does not provide specific guidance on how inventions generated through artificial intelligence should be treated. This lack of clarity gives rise to several interconnected legal challenges. Firstly, the concept of inventorship becomes problematic in cases where an invention is generated autonomously by an AI system. Since the current legal framework requires that an inventor be a natural person, it becomes difficult to attribute inventorship in a manner that accurately reflects the inventive process. Secondly, issues relating to ownership and rights allocation become increasingly complex. AI-generated inventions may involve multiple stakeholders, including developers, programmers, data providers, and users. Determining which of these parties should be entitled to patent rights is not clearly addressed under existing law. Thirdly, the application of traditional patentability criteria, particularly the requirement of an inventive step, becomes challenging when applied to machine-generated outputs. The standard of a “person skilled in the art” is based on human reasoning and may not be suitable for evaluating AI-generated inventions.

In sum, the research problem lies in the tension between rapidly evolving AI technologies and a legal framework that has not yet adapted to accommodate them. This mismatch creates uncertainty in the areas of inventorship, ownership, patentability criteria, and disclosure obligations. Addressing this problem is essential to ensure that the Indian patent system remains effective, promotes innovation, and aligns with global technological developments while safeguarding public interest. These challenges highlight the need for a re-examination of existing legal principles in light of technological advancements. In sum, the research problem lies in the tension between rapidly evolving AI technologies and a legal framework that has not yet adapted to accommodate them. This mismatch creates uncertainty in the areas of inventorship, ownership, patentability criteria, and disclosure obligations. Addressing this

problem is essential to ensure that the Indian patent system remains effective, promotes innovation, and aligns with global technological developments while safeguarding public interest.

Hypothesis of the Study

This research is based on the hypothesis that the existing Indian patent framework, particularly under the *Patents Act, 1970*, is inadequate to effectively address the legal complexities arising from AI-generated inventions. It is further hypothesised that while artificial intelligence can significantly contribute to the inventive process, the current human-centric model of patent law creates ambiguity in determining inventorship, ownership, and patentability.

The study also assumes that a balanced and adaptive legal approach—focusing on recognising human contribution while accommodating AI-assisted innovation—can provide a viable solution without fundamentally altering the structure of patent law.

Objectives of the study

The objectives of this research are as follows:

1. To understand the nature and functioning of AI-generated inventions.
2. To examine the provisions of Indian patent law relevant to inventorship and patentability.
3. To identify legal challenges associated with patenting AI-generated inventions in India.
4. To analyze international developments relating to AI and patent law.
To assess the implications of AI-generated inventions for India's patent system.
5. To suggest possible legal and policy measures to address existing gaps.
6. To propose suitable legal reforms and suggestions.

Research Questions with Analysis

The study seeks to address the following research questions:

1. Does Indian patent law permit the patenting of inventions generated by artificial intelligence?
2. Can an AI system be legally recognized as an inventor under Indian law?
3. What challenges arise in determining ownership and inventorship of AI-generated inventions?
4. How have other jurisdictions responded to the issue of AI-generated inventions?

5. What impact do AI-generated inventions have on the Indian patent framework?

Scope and Limitations

Scope

The study focuses on the issue of patentability of AI-generated inventions under Indian patent law. It includes an analysis of statutory provisions, administrative practices, and comparative international approaches. The research also considers the broader implications of AI on innovation policy in India. The study also evaluates specific exclusions under the Act, including provisions such as Section 3(k), which deals with computer-related inventions and algorithms. In addition to statutory analysis, the research considers administrative practices followed by the Indian Patent Office, including guidelines for the examination of computer-related inventions (CRIs). These practices play a crucial role in interpreting the law in the absence of explicit legislative provisions addressing AI-generated inventions. Judicial interpretations, though limited, are also examined to understand how Indian courts have approached issues relating to patentability and technological innovation. For instance, decisions such as *Ferid Allani v Union of India* provide insights into the evolving judicial approach towards technology-based inventions.²

Furthermore, the study adopts a comparative perspective by analyzing how other jurisdictions, including the United States, the European Union, and the United Kingdom, have addressed the challenges posed by AI-generated inventions. This comparative analysis helps identify global trends and best practices that may be relevant for India. Reports and studies by international organizations such as the World Intellectual Property Organization also contribute to understanding the broader impact of AI on innovation systems worldwide.³

In addition to legal analysis, the study considers the wider policy implications of AI-driven innovation in India. It examines how the development and adoption of AI technologies influence economic growth, technological self-reliance, and innovation policy. By integrating legal and policy perspectives, the study aims to provide a comprehensive understanding of the challenges and opportunities associated with AI-generated inventions.⁶

⁶ □ *Patents Act, 1970*, s 3(k).

□ *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.

□ World Intellectual Property Organization, *Technology Trends: Artificial Intelligence* (2019).

Limitations

Furthermore, the rapidly evolving nature of artificial intelligence technology means that legal developments in this area are subject to change. As a result, some of the conclusions drawn in this study may require revision in light of future developments.

Secondly, the limited availability of judicial precedents in India on AI-generated inventions restricts the depth of case law analysis. Indian courts have not yet directly addressed the issue of AI inventorship, and therefore the study relies partly on doctrinal interpretation and comparative analysis. Although cases such as *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* and *Novartis AG v Union of India* provide guidance on patentability principles, they do not specifically deal with AI-related issues.⁴

Thirdly, the rapidly evolving nature of artificial intelligence presents a significant limitation. Technological advancements in AI are occurring at a pace that often outstrips legal developments. As a result, the conclusions drawn in this study may require revision in light of future legislative reforms, judicial decisions, or technological breakthroughs. This dynamic nature of AI has also been recognised in international studies, including those conducted by the World Intellectual Property Organization.⁵

The study is confined to patent law and does not extend to other forms of intellectual property such as copyright or trademarks. Additionally, due to limited judicial interpretation in India, the research relies partly on comparative and doctrinal analysis. The rapidly evolving nature of AI technology also limits the permanence of legal conclusions. Despite its broad scope, the study is subject to certain limitations. In conclusion, while the study provides a detailed and structured analysis of AI-generated inventions under Indian patent law, its findings must be understood within the context of these limitations. The evolving nature of both law and technology necessitates continuous research and policy adaptation in this area.⁷

Research Methodology

This research follows a doctrinal research methodology. Primary sources include statutes, rules, and relevant case law. Secondary sources consist of academic literature, journal articles, policy reports, and expert commentary. Comparative analysis is used to study how foreign

-
- ⁷ *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511; *Novartis AG v Union of India* (2013) 6 SCC 1.
 - World Intellectual Property Organization (n 3).

jurisdictions address the patentability of AI-generated inventions. Secondary sources include textbooks, journal articles, policy reports, and publications by international organizations. These sources provide valuable insights into both the theoretical and practical aspects of AI-generated inventions.

In addition to doctrinal analysis, the study employs a comparative approach to examine how different jurisdictions address the issue of AI-generated inventions. This enables the identification of best practices and potential reform strategies for the Indian legal system.

Chapter Overview

This chapter introduces the research by outlining its background, significance, research problem, objectives, questions, scope, limitations, and methodology. The subsequent chapters will examine the Indian patent framework in detail, analyze legal challenges related to AI-generated inventions, review international perspectives, and propose recommendations for reform. The following chapters will build upon this foundation by examining the concept of invention in the context of artificial intelligence, analysing the Indian patent framework, exploring international approaches, and proposing recommendations for legal and policy reforms.

Scheme of the Study

The present research is systematically structured into seven chapters, each designed to address a specific dimension of the study and collectively provide a comprehensive analysis of the patentability of artificial intelligence-generated inventions within the Indian legal framework. The first chapter introduces the subject by outlining the background and significance of artificial intelligence in the modern innovation landscape. It defines the research problem, objectives, and research questions, and explains the methodology adopted for the study. The chapter also highlights the scope and limitations of the research, thereby setting the foundation for the subsequent analysis. The second chapter examines the concept of artificial intelligence and its evolving role in the inventive process. It explores the distinction between AI as a tool and AI as an independent contributor to innovation, and analyses how the traditional concept of “invention” in patent law is being challenged by technological advancements. The chapter further discusses the philosophical and legal implications of recognising machine-generated outputs within the framework of intellectual property law.

The third chapter focuses on the Indian patent system as governed by the *Patents Act, 1970*. It analyses key statutory provisions and fundamental concepts such as invention, inventive step, and the person skilled in the art. The chapter also evaluates judicial interpretations and the

treatment of computer-related inventions, with particular emphasis on their applicability to AI-generated innovations. The fourth chapter provides a comparative perspective by examining how different jurisdictions address the issue of AI-generated inventions. It analyses the legal positions in countries such as the United States, the United Kingdom, the European Union, China, Australia, and South Africa. Through this comparative analysis, the chapter identifies global trends and draws insights relevant to the Indian context. The fifth chapter critically analyses the legal challenges associated with AI-generated inventions in India. It discusses issues relating to inventorship, ownership, patent eligibility, and disclosure requirements, along with the limitations of the existing legal framework. The chapter also explores ethical considerations and policy implications arising from the increasing use of AI in innovation. The sixth chapter deals with policy considerations and proposes a way forward for addressing the identified challenges. It evaluates the need for legal reform, suggests possible approaches for accommodating AI within the patent system, and emphasises the importance of balancing innovation with public interest.

The final chapter concludes the study by summarising the key findings and offering recommendations for reform. It highlights the contribution of the research and suggests areas for future study, thereby providing a comprehensive conclusion to the research.



WHITE BLACK
LEGAL

CHAPTER I

ARTIFICIAL INTELLIGENCE AND THE CONCEPT OF INVENTION

1.1 Understanding Artificial Intelligence

Artificial Intelligence refers to computational systems designed to perform functions that typically require human cognitive abilities, such as learning, reasoning, problem-solving, and pattern recognition. Unlike traditional software that follows fixed instructions, AI systems can adapt their behavior based on data and experience. Techniques such as machine learning, deep learning, and neural networks enable AI systems to generate outcomes that are not explicitly programmed by human developers.

Modern AI technologies are largely driven by techniques such as machine learning, deep learning, and neural networks. These methodologies allow systems to process vast amounts of structured and unstructured data, identify hidden patterns, and generate predictive or innovative outputs. As a result, AI systems are increasingly capable of performing sophisticated tasks with a high degree of autonomy, thereby blurring the distinction between human intelligence and machine-generated outcomes.²

The growing autonomy of AI systems has significant implications for legal frameworks, particularly in the field of intellectual property law. As AI systems become capable of independently generating novel and useful outputs, questions arise regarding their role in the inventive process. If an AI system produces a technical solution without direct human intervention, it becomes necessary to determine whether such an output qualifies as an “invention” under existing patent laws. This issue is particularly relevant in jurisdictions like India, where the Patents Act, 1970 does not explicitly address AI-generated inventions.³

Furthermore, in the context of innovation, AI systems are increasingly utilised to analyse complex datasets, identify previously unknown relationships, and develop technical solutions across various industries. International studies, including those conducted by the World Intellectual Property Organization, highlight the growing contribution of AI to global

innovation and technological advancement.⁴

The emergence of AI-generated outputs challenges this assumption, raising fundamental questions about inventorship, ownership, and the applicability of existing patentability criteria. Addressing these issues requires a careful evaluation of legal definitions and principles to ensure that they remain relevant in the age of artificial intelligence.

1.2 AI as an Inventor vs AI as a Tool

A key issue in the debate on AI-generated inventions is whether AI should be viewed merely as an advanced tool or as an independent inventor. Traditionally, tools such as computers and machines have assisted human inventors without affecting the legal requirement of human inventorship. However, modern AI systems differ in that they may operate autonomously, producing results without direct human direction at every stage.

This distinction has significant implications for patent law. If AI is treated merely as a tool, inventorship can be attributed to the human who designed, trained, or operated the system. Conversely, if AI is regarded as an inventor, it would require a fundamental transformation of patent law, including recognition of non-human entities in legal frameworks.

When AI functions as a tool, human involvement remains central in defining the problem, selecting data, and interpreting results. In such cases, inventorship can reasonably be attributed to the human actor. Conversely, when AI systems generate solutions independently, identifying a human inventor becomes more complex. This distinction is significant because patent law, including Indian patent law, presupposes that an inventor is a natural person capable of exercising intellectual judgment. Judicial decisions across jurisdictions have consistently rejected the recognition of AI as an inventor. In *Thaler v Vidal*, the court held that the term “inventor” refers exclusively to natural persons under U.S. patent law.⁵ Similarly, in *Thaler v Comptroller-General of Patents*, it was affirmed that AI systems cannot be recognised as inventors due to the absence of legal personality.⁶

These decisions reflect a broader reluctance to depart from the traditional human-centric framework of patent law.⁸

5. ⁸ *Thaler v Vidal* 43 F 4th 1207 (Fed Cir 2022).

6. *Thaler v Comptroller-General of Patents, Designs and Trade Marks* [2023] UKSC 49.

1.3 Evolution of the Concept of "Invention" in Patent Law

The concept of an “invention” in patent law has evolved alongside technological progress. Early patent systems were designed to protect mechanical innovations that resulted directly from human ingenuity. Over time, advances in chemistry, biotechnology, and information technology have expanded the scope of patentable subject matter.

Under the Patents Act, 1970, an invention is defined as a new product or process involving an inventive step and capable of industrial application.⁷ This definition focuses on the characteristics of the invention rather than the identity of the inventor, thereby allowing for flexibility in accommodating technological developments.

However, the application of this definition to AI-generated inventions raises several challenges. The requirement of an inventive step, which involves a technical advancement that is not obvious to a person skilled in the art, is traditionally assessed based on human reasoning.⁸ When an invention is generated by an AI system, it becomes difficult to determine how this standard should be applied.

When an invention is generated by an artificial intelligence system, the application of this standard becomes problematic. AI systems may analyse vast datasets and produce outputs that appear non-obvious, yet these outputs are generated through computational processes rather than human cognitive effort. This raises important questions regarding whether the traditional test of a “person skilled in the art” remains appropriate in the context of AI-driven innovation. In addition, international frameworks such as the Agreement on Trade-Related Aspects of Intellectual Property Rights require member states to provide patent protection for inventions across all fields of technology, subject to certain conditions.⁹ However, these frameworks also remain silent on the issue of AI-generated inventions, thereby leaving individual jurisdictions to interpret and adapt their patent laws accordingly.

In conclusion, while the concept of “invention” has evolved to accommodate technological progress, the emergence of artificial intelligence presents a new frontier that challenges the

traditional human-centric foundations of patent law. Addressing these challenges requires a re-evaluation of existing legal standards to ensure that they remain relevant in the context of rapidly advancing technologies.⁹

1.4 Can Artificial Intelligence Truly Invent? Philosophical and Technical Considerations

The question of whether AI can truly invent involves both philosophical and technical considerations. Philosophically, invention has been associated with human creativity, intention, and consciousness. Critics argue that AI lacks awareness and intentionality, and therefore cannot be considered an inventor in the true sense.

From a technical perspective, AI systems generate outputs based on algorithms, training data, and probabilistic models. While these outputs may be novel and useful, they are ultimately derived from pre-existing data and human-designed frameworks. Supporters of AI inventorship contend that the absence of human foresight in specific outcomes supports the view that AI is capable of generating inventions independently.

However, this view is increasingly being challenged. Proponents of AI inventorship argue that the unpredictability of AI-generated outputs supports the recognition of AI as an inventor. In many cases, even the developers of AI systems cannot fully predict the results produced by the system, suggesting a level of independence in the inventive process.

This debate highlights the tension between traditional legal notions of invention and the realities of modern technological development.

1.5 Comparative Perspective: Human Creativity vs Machine Outputs

Human creativity is often characterized by intuition, subjective judgment, and contextual understanding. Human inventors draw upon personal experience and cognitive reasoning to

7. ⁹ *Patents Act, 1970*, s 2(1)(j) and s 2(1)(ja).

8. *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.

9. *Agreement on Trade-Related Aspects of Intellectual Property Rights*, art 27.

solve problems in unpredictable ways. In contrast, AI-generated outputs are the result of computational processes that analyze data and optimize outcomes based on predefined objectives.

Despite these differences, AI-generated outputs can demonstrate levels of novelty and technical advancement comparable to human-created inventions. This raises important questions about whether patent law should focus on the process of creation or the nature of the output. A comparative analysis suggests that insisting exclusively on human creativity may limit the patent system's ability to respond to emerging forms of innovation.

Judicial decisions across jurisdictions have largely favoured a process-oriented approach, reinforcing the requirement of human inventorship. In *Thaler v Vidal*, the United States Court of Appeals for the Federal Circuit held that the term "inventor" under U.S. patent law refers exclusively to natural persons, thereby rejecting the recognition of an AI system as an inventor.² Similarly, in *Thaler v Comptroller-General of Patents, Designs and Trade Marks*, the United Kingdom Supreme Court affirmed that AI systems cannot be recognised as inventors due to the absence of legal personality and the inability to hold rights or duties.³

These decisions reflect a consistent judicial reluctance to depart from the traditional human-centric framework of patent law. The emphasis remains on the process of invention, particularly the requirement of human intellectual contribution. In the Indian context, although courts have not directly addressed AI inventorship, principles laid down in cases such as *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* highlight that inventiveness is assessed based on what is non-obvious to a "person skilled in the art," a standard inherently grounded in human reasoning.⁴

In conclusion, the comparison between human creativity and machine-generated outputs highlights a critical challenge for modern patent law. While current legal systems prioritise human inventorship, the increasing capabilities of AI systems call for a re-evaluation of whether patent protection should be based on the inventive process or the resulting innovation. A balanced approach that preserves legal certainty while accommodating technological progress is essential for the future of patent law.¹⁰

1. ¹⁰ World Intellectual Property Organization, *Technology Trends: Artificial Intelligence* (2019).

2. *Thaler v Vidal* 43 F 4th 1207 (Fed Cir 2022).

3. *Thaler v Comptroller-General of Patents, Designs and Trade Marks* [2023] UKSC 49.

4. *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.

5. World Intellectual Property Organization (n 1).

1.6 Critical Evaluation

The existing patent framework is not fully equipped to address the complexities associated with AI-generated inventions. While it is possible to accommodate AI-assisted inventions within the current legal system, fully autonomous AI-generated inventions present significant challenges.

On one hand, excluding AI-generated inventions from patent protection may discourage innovation and limit the potential benefits of AI technologies. On the other hand, recognising AI as an inventor without establishing clear rules for ownership and accountability may create legal uncertainty.

Therefore, it is necessary to adopt a balanced and pragmatic approach that acknowledges the role of AI in innovation while maintaining the integrity of the patent system.

1.7 Future of AI in Patent Law

The rapid evolution of artificial intelligence is expected to fundamentally transform the landscape of patent law in the coming decades. As AI systems become increasingly sophisticated and capable of generating complex and innovative outputs, the traditional legal framework governing patents may face growing pressure to adapt. The future of patent law will therefore depend on its ability to respond effectively to these technological developments while maintaining its core principles.

One possible direction for reform is the development of a more flexible approach to inventorship. While current legal systems restrict inventorship to natural persons, there is an ongoing debate regarding whether this requirement should be modified to accommodate AI-generated inventions. Some scholars argue for the recognition of AI as a legal inventor, while others suggest alternative models that attribute inventorship to human actors who are closely associated with the AI system, such as developers or operators.

Another significant area of future development relates to the standard of inventive step. AI systems have the ability to analyse vast datasets and identify solutions that may not be obvious to human experts. This raises concerns that the existing standard of a “person skilled in the art” may become outdated. In the future, patent law may need to redefine this standard to account for the capabilities of AI systems, possibly by introducing a higher threshold for inventive step or by incorporating AI-assisted benchmarks.

The issue of disclosure is also likely to become increasingly important. As AI systems continue to function as complex and opaque “black boxes,” ensuring compliance with disclosure requirements will remain a major challenge. Future reforms may require the development of new disclosure standards that balance the need for transparency with the technical complexity of AI systems.

International harmonisation is another key aspect of the future of AI and patent law. Given the global nature of innovation, inconsistencies between national legal systems may create barriers to the protection and commercialization of AI-generated inventions. Collaborative efforts through international organizations such as the World Intellectual Property Organization may play a crucial role in developing uniform guidelines and best practices.

From a policy perspective, the future of patent law must also consider broader societal implications, including ethical concerns, access to technology, and the concentration of technological power. Ensuring that the patent system continues to promote innovation while safeguarding public interest will be a critical challenge for policymakers.

Ultimately, the future of AI in patent law will require a careful balance between innovation and regulation. While it is essential to adapt legal frameworks to accommodate technological advancements, it is equally important to preserve the fundamental principles that underpin the patent system.



Chapter II

Legal Framework of Patent Law in India

2.1 Overview of the Patents Act, 1970

The Patents Act, 1970 constitutes the primary legal framework governing patent protection in India. The Act is founded on the principle of balancing private rights with public interest, granting inventors exclusive rights over their inventions for a limited period in exchange for full disclosure of the invention to the public. This disclosure requirement ensures that knowledge is disseminated, thereby promoting further innovation and technological development.¹

The Act has undergone several amendments to align with international obligations, particularly under the Agreement on Trade-Related Aspects of Intellectual Property Rights. The most significant amendment occurred in 2005, which introduced product patents in pharmaceuticals and chemicals, thereby expanding the scope of patentable subject matter. At the same time, India retained important safeguards, such as strict patentability standards and provisions to prevent evergreening of patents. These safeguards were judicially affirmed in *Novartis AG v Union of India*, where the Supreme Court emphasised that patent protection should not be granted for minor modifications lacking genuine innovation.³

The administration of the patent system in India is overseen by the Office of the Controller General of Patents, Designs and Trade Marks, which is responsible for examining patent applications, granting patents, and ensuring compliance with statutory requirements. The

examination process involves assessing whether an invention satisfies key criteria such as novelty, inventive step, and industrial applicability, as defined under the Act.

Judicial interpretation has played a crucial role in shaping the contours of patent law in India. Courts have clarified the meaning of essential concepts such as “inventive step” and “technical advancement.” In *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, the Supreme Court held that an invention must demonstrate a technical advancement that is not obvious to a person skilled in the art.⁴ Similarly, in *F Hoffmann-La Roche Ltd v Cipla Ltd*, the Delhi High Court elaborated on the standards for assessing patent infringement and the importance of balancing patent rights with public access.⁵

In conclusion, the Patents Act, 1970 provides a robust and well-established framework for patent protection in India, supported by judicial interpretation and administrative practice. However, its human-centric foundations present limitations when applied to emerging technologies such as artificial intelligence, thereby necessitating a re-evaluation of its provisions in the context of modern innovation.¹¹

2.2 Definitions of “Invention,” “Inventive Step,” and “Person Skilled in the Art”

Under the Patents Act, an “invention” is defined as a new product or process that involves an inventive step and is capable of industrial application. This definition establishes novelty, inventive step, and industrial applicability as the core requirements for patent protection.

The term “inventive step” refers to a technical advancement or economic significance that is not obvious to a person skilled in the art. The “person skilled in the art” is a legal construct used to assess whether an invention is sufficiently non-obvious. This hypothetical person is presumed to have ordinary knowledge of the relevant field but lacks inventive capacity.

The “person skilled in the art” is a hypothetical legal construct used to assess obviousness. This individual is presumed to have ordinary knowledge of the relevant field but lacks inventive capacity. Courts have consistently relied on this standard to determine whether an invention meets the threshold of non-obviousness.

In *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, the Supreme Court clarified that an invention must involve more than mere workshop improvement.³ Similarly, in *Novartis AG v Union of India*, the Court emphasised strict standards for inventive step,

¹¹ □ *Patents Act, 1970*.

□ N Rajagopala Ayyangar, *Report on the Revision of the Patents Law* (Government of India 1959).

□ *Novartis AG v Union of India* (2013) 6 SCC 1.

□ *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511

particularly in pharmaceutical patents.⁴

In the context of AI-generated inventions, these definitions raise complex issues. The assessment of inventive step traditionally relies on human reasoning standards, making it unclear how outputs produced autonomously by AI systems should be evaluated.

2.3 Criteria for Patentability in India

To qualify for patent protection in India, an invention must satisfy three primary criteria: novelty, inventive step, and industrial applicability. Novelty requires that the invention has not been anticipated by prior art. Inventive step demands that the invention is not obvious to a person skilled in the art, and industrial applicability requires that the invention can be made or used in an industry.

Novelty requires that the invention has not been disclosed to the public prior to the filing date. Any prior publication or use may defeat novelty. The requirement of inventive step ensures that the invention is not obvious to a person skilled in the art. Industrial applicability requires that the invention can be used in some form of industry.

In addition to these criteria, the Patents Act excludes certain subject matter from patentability under Sections 3 and 4. These exclusions reflect policy considerations and public interest concerns.

2.4 Judicial Interpretation of Patentability

Indian courts have played a crucial role in shaping the interpretation of patentability requirements under the Patents Act, 1970. Through judicial decisions, courts have clarified key concepts such as novelty, inventive step, and technical advancement, often emphasizing the need for a genuine and substantive contribution beyond existing knowledge. This judicial approach ensures that patent protection is granted only to inventions that meaningfully advance the state of the art, thereby preventing the misuse of patent rights.

In *Novartis AG v Union of India*, the Supreme Court adopted a strict and purposive approach to patentability, particularly in relation to incremental innovations in the pharmaceutical sector.¹ The Court held that patents should not be granted for minor modifications unless they result in a significant enhancement of therapeutic efficacy. This decision reflects India's commitment to preventing "evergreening" of patents and maintaining a balance between innovation and public access to essential medicines. Similarly, in *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, the Supreme Court clarified that an invention must demonstrate real ingenuity and technical advancement rather than mere workshop

improvements or routine experimentation.² The Court emphasised that the inventive step must go beyond what would be obvious to a person skilled in the art, thereby setting a high threshold for patentability. Further, in *F Hoffmann-La Roche Ltd v Cipla Ltd*, the Delhi High Court elaborated on the application of patentability standards in complex technological contexts, particularly in pharmaceutical patents.³ The Court highlighted the importance of balancing patent rights with public interest while ensuring that only genuine innovations receive protection.

These decisions collectively highlight the judiciary's role in maintaining rigorous standards of patentability in India. However, they also reflect a fundamentally human-centric understanding of invention, where creativity and inventiveness are inherently linked to human intellectual activity. As Indian courts have not yet directly addressed the issue of AI-generated inventions, existing jurisprudence provides limited guidance on how such inventions should be evaluated. Consequently, the application of traditional judicial principles—such as the “person skilled in the art” standard and the requirement of human ingenuity—may prove inadequate in the context of AI-driven innovation. This gap underscores the need for judicial and legislative clarification to ensure that patent law remains responsive to emerging technological developments.¹²

2.5 Current Position on Computer-Related Inventions (CRIs)

Computer-related inventions occupy a unique position within Indian patent law. Section 3(k) of the Patents Act excludes mathematical methods, business methods, computer programs per se, and algorithms from patentability. However, judicial interpretation and Patent Office guidelines have clarified that inventions demonstrating a technical effect or technical contribution may be eligible for protection.

The treatment of CRIs is particularly relevant to AI-generated inventions, as many AI systems rely on algorithms and computational processes. While patents may be granted for AI-based inventions that produce a tangible technical outcome, ambiguity persists regarding inventorship and ownership when the inventive contribution is generated autonomously by AI

1. ¹² *Novartis AG v Union of India* (2013) 6 SCC 1.
2. *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.
3. *F Hoffmann-La Roche Ltd v Cipla Ltd* 2015 SCC OnLine Del 10190.

2.6 Applicability of the Indian Patent Framework to AI-Generated Inventions

The existing patent framework under the Patents Act, 1970 was developed on the fundamental assumption that inventions are the result of human ingenuity and intellectual effort. While the Act provides a comprehensive structure for assessing patentability through criteria such as novelty, inventive step, and industrial applicability, it does not explicitly address inventions generated by artificial intelligence. This creates significant interpretative challenges when applying traditional legal standards to AI-driven innovations. One of the primary issues lies in the requirement of inventorship. Under Indian patent law, the inventor is understood to be a natural person who contributes intellectually to the creation of an invention. However, in the case of AI-generated inventions, the inventive contribution may originate from an autonomous system rather than a human actor. This raises questions regarding whether inventorship can be attributed to individuals such as programmers, data scientists, or users of the AI system, even when their involvement in the final output is indirect.

Judicial interpretation, as seen in *Ferid Allani v Union of India*, has clarified that computer-related inventions may be patentable if they provide a tangible technical advancement.² However, the application of this principle to AI-generated inventions remains uncertain. In *Thaler v Vidal*, the United States Court of Appeals held that only natural persons can be recognized as inventors under patent law.³ Similarly, in *Thaler v Comptroller-General of Patents, Designs and Trade Marks*, the United Kingdom Supreme Court reaffirmed that artificial intelligence lacks legal personality and therefore cannot be considered an inventor.⁴ These decisions illustrate a global reluctance to extend inventorship to non-human entities, reinforcing the human-centric nature of patent systems.¹³

1. ¹³ *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.
2. *Thaler v Vidal* 43 F 4th 1207 (Fed Cir 2022).
3. *Thaler v Comptroller-General of Patents, Designs and Trade Marks* [2023] UKSC 49.

Chapter III

Patentability of AI-Generated Inventions – Global Perspective

3.1 Introduction

The rapid advancement of artificial intelligence has prompted patent offices and courts across the world to reconsider traditional notions of inventorship and patentability. While most patent systems were developed on the assumption of human inventors, the emergence of AI-generated inventions has exposed gaps in existing legal frameworks. Different jurisdictions have responded to this challenge in varying ways, offering valuable insights for India. This chapter examines the approaches adopted in key jurisdictions and evaluates their relevance for the Indian patent regime.

The emergence of artificial intelligence as a tool capable of generating inventive outputs has compelled jurisdictions across the world to reconsider the foundational principles of patent law. Traditionally, patent systems have been built upon the assumption that inventions are the result of human intellectual effort. However, AI technologies have disrupted this assumption by introducing the possibility of autonomous invention.

Globally, legal systems have responded cautiously to this development. While there is recognition of the growing role of AI in innovation, most jurisdictions have refrained from granting legal status to AI as an inventor. Instead, they have attempted to reconcile technological advancements with existing legal doctrines.¹⁴

3.2 United States: USPTO's Position

In the United States, patent law is governed by the Patent Act, which implicitly assumes that an inventor is a natural person. The United States Patent and Trademark Office (USPTO) has taken a clear position that inventorship is limited to human beings. Patent applications that name an artificial intelligence system as an inventor have been rejected on the ground that AI does not qualify as a “person” under U.S. law.

The USPTO has emphasized that inventorship requires mental conception of the invention, which is considered a human cognitive act. While AI-assisted inventions are patentable, the human contributor who exercises creative control over the invention must be identified as the

-
1. ¹⁴ World Intellectual Property Organization, ‘Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence’ (2020).
 2. World Intellectual Property Organization, *Technology Trends: Artificial Intelligence* (2019).
 3. Ryan Abbott, *The Reasonable Robot* (Cambridge University Press 2020).

inventor. This approach reflects a strict adherence to traditional inventorship principles, prioritizing legal certainty over technological evolution.

This position was reaffirmed in the landmark case of *Thaler v Vidal*, where the court held that an AI system cannot be listed as an inventor under U.S. law.¹ The court reasoned that the statutory language refers to individuals, thereby excluding non-human entities.

The U.S. approach is grounded in the concept of “mental conception,” which is considered a fundamental requirement for inventorship. Since AI systems lack consciousness and intentionality, they are incapable of satisfying this requirement.

However, the U.S. system does recognise AI-assisted inventions. Where a human exercises sufficient control over the inventive process, inventorship can be attributed to that individual. This approach reflects a pragmatic attempt to accommodate technological developments without altering the core structure of patent law.

Critically, this approach has been criticised for being overly restrictive. By excluding AI-generated inventions from patent protection, it may discourage innovation in AI-intensive industries.

3.3 European Union: European Patent Office (EPO) Guidelines

The European Patent Office has similarly declined to recognize artificial intelligence systems as inventors. Under the European Patent Convention, an inventor must be a natural person, and the identification of the inventor is treated as a formal legal requirement. Applications naming AI systems as inventors have been refused for failing to meet this requirement.

In decisions involving AI-generated inventions, the EPO has refused applications that list AI systems as inventors. The reasoning is based on formal requirements, which mandate the identification of a human inventor.

At the same time, the EPO has acknowledged the increasing role of AI in the inventive process. It allows patents for inventions developed with the assistance of AI, provided that a human inventor is identified.

The European approach is characterised by legal formalism combined with practical flexibility. While it preserves the requirement of human inventorship, it does not prevent the patenting of AI-assisted innovations.

However, the EPO has acknowledged the growing role of AI in the inventive process. While AI cannot be named as an inventor, inventions developed with the assistance of AI may still be patented, provided a human inventor is identified. The EPO’s approach maintains doctrinal

consistency while leaving open the possibility of future policy reform.

3.4 United Kingdom: The DABUS Cases

The United Kingdom has emerged as a key jurisdiction in the global debate on AI-generated inventions, particularly through litigation involving the DABUS (Device for the Autonomous Bootstrapping of Unified Sentience) artificial intelligence system. The central issue before the courts was whether an AI system could be recognised as an “inventor” under UK patent law, thereby challenging the traditional human-centric framework of inventorship.

In *Thaler v Comptroller-General of Patents, Designs and Trade Marks*, the matter progressed through multiple judicial levels, culminating in a decision by the UK Supreme Court.¹ The applicant, Dr Stephen Thaler, had filed patent applications naming DABUS as the inventor, arguing that the inventions were autonomously generated by the AI system. The UK Intellectual Property Office rejected the application on the ground that the Patents Act 1977 requires an inventor to be a natural person. The Court of Appeal, and subsequently the Supreme Court, upheld this position, affirming that an inventor must be a natural person with legal personality. The courts emphasised that the statutory framework under the Patents Act 1977 is premised on the assumption that inventors are human beings capable of holding rights and obligations. Since AI systems lack legal personality, they cannot be recognised as inventors, nor can they transfer ownership rights in an invention.²

The Supreme Court further clarified that the requirement to identify a human inventor is not merely a procedural formality but a substantive legal condition for the grant of a patent. The absence of a legally recognised inventor renders a patent application defective. This interpretation reinforces the principle that inventorship is intrinsically linked to legal accountability and ownership, both of which presuppose human agency. At the same time, the courts acknowledged the increasing role of artificial intelligence in the inventive process. While AI systems may significantly contribute to the generation of innovative outputs, such contributions do not displace the requirement of human inventorship under existing law. The decision thus draws a clear distinction between AI-assisted inventions, which remain patentable if a human inventor is identified, and AI-generated inventions, which fall outside the scope of current legal recognition.

The UK position reflects a broader judicial reluctance to extend inventorship to non-human entities without explicit legislative reform. It highlights the limitations of existing patent frameworks in addressing emerging technologies and underscores the need for policy intervention. By maintaining a strict human-centric interpretation, UK courts have prioritised

legal certainty and coherence over technological adaptability.

In conclusion, the DABUS litigation in the United Kingdom reaffirms that patent law, as presently structured, does not accommodate artificial intelligence as an inventor. While the decisions recognise the transformative impact of AI on innovation, they also emphasise that any departure from traditional inventorship principles must be undertaken through legislative, rather than judicial, reform.¹⁵

3.5 Australia, South Africa, and China Comparison review

Australia

Australia initially appeared open to recognizing AI-generated inventions when a lower court accepted an AI system as an inventor. However, this position was later overturned on appeal, with higher courts reaffirming that inventorship is limited to natural persons. The final position aligns Australia with other major patent jurisdictions.

In the first instance, the Federal Court of Australia adopted a progressive interpretation by holding that the term “inventor” is not necessarily confined to natural persons. The court reasoned that the statutory framework did not explicitly exclude non-human entities and that patent law should evolve in response to technological advancements. This decision marked one of the first judicial acknowledgments of the possibility of AI inventorship.

However, this position was subsequently overturned by the Full Federal Court in *Commissioner of Patents v Thaler*.¹ The appellate court held that the concept of inventorship is intrinsically linked to human agency and legal personality. It emphasised that only a natural person can be recognised as an inventor because the patent system is structured around rights and obligations that cannot be assigned to non-human entities.

The court further noted that allowing AI systems to be recognised as inventors would create practical difficulties in relation to ownership, entitlement, and enforcement of patent rights. Since AI lacks legal personality, it cannot own property, transfer rights, or be held accountable. From a policy perspective, Australia’s final position aligns with the global consensus that patent law should remain human-centric. However, the initial decision of the Federal Court demonstrates a willingness within the judiciary to reconsider traditional legal concepts in light of technological change.

¹ *Thaler v Comptroller-General of Patents, Designs and Trade Marks* [2023] UKSC 49.
² *ibid.*

Critically, Australia's experience highlights the tension between innovation and legal certainty. While recognising AI as an inventor may reflect technological reality, it risks disrupting the coherence of the patent system. Conversely, restricting inventorship to humans may lead to artificial attribution, where individuals are named as inventors despite limited contribution. Thus, Australia represents a jurisdiction where the debate on AI inventorship has been actively tested but ultimately resolved in favour of maintaining traditional legal principles. In conclusion, Australia represents a jurisdiction where the question of AI inventorship has been directly tested through judicial scrutiny. While the final legal position reaffirms traditional principles, the debate itself highlights the growing need for legislative and policy reform to address the challenges posed by artificial intelligence in the patent system.¹⁶

South Africa

South Africa stands out as an exception, having granted a patent that listed an AI system as the inventor. However, this development must be viewed cautiously, as South Africa follows a non-substantive examination system. The grant does not necessarily reflect judicial endorsement of AI inventorship but highlights the absence of rigorous scrutiny. At first glance, this appears to mark a significant departure from the prevailing global approach, which generally restricts inventorship to natural persons. However, a closer examination reveals that the South African position is shaped more by procedural characteristics than by a deliberate shift in legal policy.

Unlike jurisdictions such as the United States, the United Kingdom, or Australia, South Africa follows a non-substantive examination system for patent applications. This means that patent applications are not rigorously examined for compliance with substantive requirements such as novelty, inventive step, or proper inventorship before being granted. Instead, patents are granted based on formal compliance with filing requirements. As a result, the acceptance of an AI system as an inventor in South Africa does not necessarily indicate judicial or legislative recognition of AI inventorship. Rather, it reflects the absence of detailed scrutiny during the examination process. This distinction is crucial in evaluating the significance of South Africa's approach.

From a legal perspective, the South African framework does not explicitly provide for AI inventorship. The relevant legislation, the Patents Act of South Africa, does not define

¹⁶ □ *Thaler v Commissioner of Patents* [2021] FCA 879.
□ *Commissioner of Patents v Thaler* [2022] FCAFC 62.

“inventor” in a manner that clearly includes or excludes artificial intelligence. This ambiguity,¹⁷ combined with the lack of substantive examination, allowed the DABUS application to proceed without challenge.

However, this situation raises important concerns regarding the reliability and enforceability of such patents. Since the grant of the patent was not based on a detailed examination of inventorship or patentability criteria, its validity may be subject to challenge in future litigation. Courts may ultimately be required to determine whether AI can be recognised as an inventor under South African law.

Comparatively, South Africa remains an outlier rather than a model for other jurisdictions. Most countries have adopted a cautious approach, emphasising the need for legal certainty and human accountability. The South African example illustrates that merely allowing AI inventorship without a supporting legal framework may lead to inconsistencies and potential disputes.

Therefore, while South Africa’s recognition of an AI inventor is often cited as a landmark development, its practical significance is limited. It serves more as an illustration of procedural flexibility than as a definitive endorsement of AI inventorship.

China

China adopts a pragmatic and policy-driven approach to artificial intelligence (AI) and intellectual property. While AI systems are not recognised as inventors under Chinese law, patent protection is available for AI-generated inventions where sufficient human involvement can be demonstrated.

Under the Patent Law of the People's Republic of China, inventorship is expressly limited to natural persons. Article 13 (read with Article 2) implies that only human beings can be identified as inventors, thereby excluding AI systems from legal recognition. This position has been consistently upheld in administrative and judicial practice.

A key judicial development is *Shenzhen Tencent Computer System Co Ltd v Shanghai Yingxun Technology Co Ltd* (2019), where the court held that AI-generated content could be protected under copyright law if it reflects human intellectual input in its creation. Although this case concerns copyright, it is frequently cited in patent discourse to support the proposition

23. ¹⁷Companies and Intellectual Property Commission, Patent No 2021/03242 (2021).

24. Patents Act 1978.

25. World Intellectual Property Organization (2019).

that human contribution remains central to intellectual property protection in China.

In the patent context, the Guidelines for Patent Examination (2020 Amendment) issued by the China National Intellectual Property Administration (CNIPA) provide critical clarification. The Guidelines state that inventions involving algorithms, AI, and big data are patentable if they:

- constitute a technical solution,
- solve a technical problem, and
- produce a technical effect.

This reflects Article 2 of the Patent Law, which defines an invention as a “new technical solution relating to a product, a process, or an improvement thereof” (CNIPA, 2020).

China’s stance on AI inventorship was further clarified in the DABUS Patent Application Case China, where an application listing an AI system (DABUS) as the inventor was rejected. The court reaffirmed that only natural persons qualify as inventors, aligning China with other jurisdictions such as the UK and US. However, the decision did not deny patentability to AI-assisted inventions; rather, it emphasised the necessity of identifying a human inventor.

This approach is reinforced by national policy. The New Generation Artificial Intelligence Development Plan explicitly promotes AI innovation and calls for strengthening intellectual property protection in emerging technologies. The policy has influenced CNIPA’s examination practices, encouraging a flexible interpretation of patentability requirements to support technological growth.

Chinese patent law also imposes strict disclosure requirements under Article 26. Applicants must clearly describe:

- the algorithmic structure,
- data processing methods, and the technical contribution of AI.

China’s approach represents a pragmatic compromise between legal tradition and technological progress. By maintaining human inventorship while adopting flexible patentability standards, China has successfully integrated AI into its intellectual property regime. Its policy-driven and adaptive framework offers a model for other jurisdictions seeking to regulate AI innovation without disrupting foundational legal principles. This ensures compliance with the enablement and sufficiency standards despite the complexity of AI systems (CNIPA Guidelines, 2020).

From a comparative perspective, China’s position mirrors developments in other jurisdictions. For instance, in *Thaler v Comptroller-General of Patents, Designs and Trade Marks*, the UK Supreme Court similarly rejected AI inventorship while acknowledging that AI-assisted inventions may still be patentable if a human inventor is identified.

China's approach represents a pragmatic compromise between legal tradition and technological progress. By maintaining human inventorship while adopting flexible patentability standards, China has successfully integrated AI into its intellectual property regime. Its policy-driven and adaptive framework offers a model for other jurisdictions seeking to regulate AI innovation without disrupting foundational legal principles.¹⁸

3.6 Lessons for India

The global experience demonstrates a consistent reluctance to recognize artificial intelligence as an inventor under existing patent laws. Most jurisdictions continue to emphasize human inventorship while allowing patent protection for AI-assisted inventions. This approach reflects concerns related to legal accountability, ownership, and enforcement.

This approach reflects several underlying concerns, including legal accountability, ownership rights, and enforcement mechanisms. Recognising AI as an inventor would require fundamental changes to legal systems, including the concept of legal personality.

For India, these developments highlight the need for clarity rather than immediate recognition of AI as an inventor. India may consider issuing administrative guidelines or legislative clarifications addressing AI-assisted inventions, inventorship attribution, and ownership rights. A cautious yet adaptive approach would allow India to encourage AI-driven innovation while maintaining doctrinal stability in patent law.

At the same time, India must ensure that its patent system remains adaptable to future technological developments. This may involve issuing guidelines, promoting policy discussions, and engaging with international developments.

19

¹⁸ □ Patent Law of the People's Republic of China (as amended 2020), Arts. 2, 13, 26.

□ CNIPA, *Guidelines for Patent Examination* (2020 Amendment).

□ Shenzhen Tencent Computer System Co Ltd v Shanghai Yingxun Technology Co Ltd (2019) Yue 0305 Min Chu No. 14010.

26. ¹⁹ World Intellectual Property Organization (n 1).

27. Abbott (n 3).

28. European Patent Office (n 9).

Chapter IV

Legal Challenges in the Indian Context

4.1 Introduction

The increasing use of artificial intelligence in the inventive process presents significant challenges for the Indian patent system. While existing patent laws were designed to regulate human-driven innovation, AI-generated inventions do not fit neatly within these traditional legal categories. The absence of explicit statutory guidance in India has resulted in uncertainty regarding inventorship, ownership, patent eligibility, and ethical accountability. This chapter examines the key legal challenges associated with AI-generated inventions under the Indian patent framework. AI-generated inventions challenge this foundational assumption by introducing the possibility of autonomous creation. As a result, the existing patent framework faces difficulties in addressing issues related to inventorship, ownership, patent eligibility, and compliance with disclosure requirements. AI-generated inventions, particularly those developed with minimal or no direct human intervention, do not fit comfortably within the existing legal framework. This has given rise to a range of complex and interrelated legal issues, including the determination of inventorship, allocation of ownership rights, assessment of patent eligibility, and compliance with statutory disclosure requirements. The absence of explicit legislative provisions or judicial guidance addressing these issues has created a significant degree of uncertainty within the Indian patent system, thereby affecting both innovators and patent authorities.

One of the most pressing challenges lies in the concept of inventorship. Under Indian patent

law, inventorship is implicitly linked to a natural person who contributes intellectually to the creation of an invention. This requirement becomes problematic in cases where an AI system independently generates an invention without identifiable human contribution at the stage of conception. In such scenarios, the current legal framework compels applicants to attribute inventorship to a human actor, even where such attribution may not accurately reflect the reality of the inventive process. This artificial attribution not only undermines the integrity of the patent system but also raises concerns regarding legal transparency and accountability. This chapter critically examines the key legal challenges associated with AI-generated inventions in India, highlighting the gaps in the current framework and the need for reform.²⁰

4.2 Lack of Clear Legal Recognition of AI as an Inventor

Indian patent law does not expressly recognize artificial intelligence systems as inventors. The Patents Act, 1970 assumes that an inventor is a natural person capable of exercising intellectual judgment. As a result, inventions generated autonomously by AI systems cannot be directly attributed to the AI itself. Patent applications involving AI-generated inventions must artificially attribute inventorship to a human, even where human involvement is minimal. Such attribution may undermine the integrity of the patent system and create inconsistencies in the examination process. One of the most fundamental challenges in the Indian context is the absence of legal recognition of artificial intelligence as an inventor. The Patents Act, 1970 does not define “inventor” explicitly, but its provisions implicitly assume that an inventor is a natural person.

This assumption is reinforced by procedural requirements that mandate the identification of an individual inventor in patent applications. Consequently, AI systems cannot be named as inventors, even where they have independently generated the invention. This issue has been examined in international jurisprudence. In *Thaler v Vidal*, the court held that inventorship is limited to natural persons.¹ Similarly, in *Thaler v Comptroller-General of Patents*, it was held that AI lacks legal personality and cannot be recognised as an inventor.²

Although Indian courts have not directly addressed this issue, the reasoning adopted in these cases is likely to influence Indian jurisprudence. The absence of recognition creates a legal

1. ²⁰Patents Act, 1970.
2. World Intellectual Property Organization.

fiction, where human actors are named as inventors despite limited involvement. This undermines the integrity and transparency of the patent system.²¹

4.3 Attribution of Inventorship: Who Owns the Patent?

Determining ownership of AI-generated inventions presents another major challenge. Traditional patent law links inventorship with ownership, either directly or through assignment. In the case of AI-generated inventions, multiple parties may be involved, including the AI developer, data provider, system operator, or end user.

Closely related to inventorship is the issue of ownership. Under traditional patent law principles, the inventor is the initial owner of the patent, subject to assignment or contractual arrangements.

In the case of AI-generated inventions, identifying the rightful owner becomes complex due to the involvement of multiple stakeholders. These may include:

- Developers who design the AI system
- Entities that provide training data
- Users who deploy the system
- Organizations that fund the research

The problem is further compounded by the absence of clear rules regarding the allocation of rights in AI-generated inventions. Assigning ownership to individuals who did not contribute to the inventive process raises questions of fairness and legal validity.

Indian patent law does not provide guidance on how ownership should be allocated in such situations. Assigning inventorship to individuals who did not make a substantive inventive

1. ²¹ Thaler v Vidal 43 F 4th 1207.
2. Thaler v Comptroller-General of Patents [2021] EWCA Civ 1374.
3. World Intellectual Property Organization.

contribution raises concerns regarding fairness and legal accuracy. Without clear rules, disputes over ownership and rights are likely to increase as AI-driven innovation expands.²²

4.4 Section 3(k): Exclusion of Algorithms and Abstract Ideas

Section 3(k) of the Patents Act excludes mathematical methods, computer programs per se, and algorithms from patentability. This provision poses a significant obstacle for AI-generated inventions, many of which rely heavily on algorithmic processes.

The interpretation of Section 3(k) has evolved through administrative guidelines and judicial decisions. The Office of the Controller General of Patents, Designs and Trade Marks has clarified that inventions demonstrating a “technical effect” may be patentable.¹

In *Ferid Allani v Union of India*, the Delhi High Court held that computer-related inventions are patentable if they demonstrate a technical contribution.²

Although Indian Patent Office guidelines allow patent protection for computer-related inventions that demonstrate a technical effect, the boundary between patentable and non-patentable subject matter remains unclear. AI-generated inventions may be rejected on the ground that they fall within excluded categories, even when they produce tangible technical outcomes. Despite these developments, ambiguity persists. AI-generated inventions may still be rejected if they are perceived as falling within the excluded categories. This creates uncertainty for applicants and may discourage innovation.²³

1. ²² Patents Act, 1970, s 6.

2. Ryan Abbott, *The Reasonable Robot* (Cambridge University Press 2020).

3. World Intellectual Property Organization.

1. ²³ Office of the Controller General of Patents, Designs and Trade Marks, CRI Guidelines (2017).

2. *Ferid Allani v Union of India* 2019 SCC Online Del 11867.

3. Patents Act, 1970, s 3(k).

4.5 Disclosure Norms and the Black Box Problem

Patent law requires full and clear disclosure of the invention to enable a person skilled in the art to reproduce it. However, many AI systems operate as “black boxes,” where the decision-making process is not fully transparent, even to their creators. This lack of explainability raises serious concerns regarding compliance with disclosure requirements under Indian patent law. If the functioning of an AI-generated invention cannot be adequately explained, patent protection may be denied. This challenge highlights the tension between transparency requirements and the complex nature of modern AI systems.

A cornerstone of patent law is the requirement of full and sufficient disclosure, which ensures that an invention is described in a manner that enables a person skilled in the art to reproduce it without undue experimentation. This requirement is codified under Section 10 of the Patents Act, 1970, which mandates that the complete specification must clearly and fully describe the invention and its operation. The rationale behind this requirement is rooted in the fundamental bargain of patent law: in exchange for a time-limited monopoly, the inventor must disclose the technical knowledge underlying the invention to the public. This promotes the dissemination of knowledge and facilitates further innovation.

However, the emergence of artificial intelligence introduces a significant challenge to this principle. Many advanced AI systems, particularly those based on deep learning and neural networks, function as “black box” systems. This means that while the inputs and outputs of the system may be observable, the internal decision-making processes are often opaque, complex, and difficult to interpret—even by the developers themselves. This lack of transparency creates serious difficulties in complying with disclosure requirements. If an inventor cannot adequately explain how the AI system arrived at a particular solution, it becomes challenging to satisfy the requirement of enabling disclosure. The question arises whether merely disclosing the algorithm, training data, and system architecture is sufficient, or whether a deeper explanation of the decision-making process is required. Therefore, there is a need to reconsider how disclosure requirements should be applied to AI-based inventions. Possible approaches include requiring detailed disclosure of training methodologies, datasets, and system parameters, even if the internal decision-making process cannot be fully explained.²⁴

1. ²⁴ Patents Act, 1970, s 10.

4.6 Moral and Ethical Concerns

The patentability of AI-generated inventions is not merely a legal issue but also raises significant ethical and policy considerations. These concerns relate to questions of accountability, fairness, access to technology, and the broader societal impact of artificial intelligence.

One of the primary ethical concerns is accountability. Traditional patent law assumes that an inventor is a human agent who can be held responsible for the invention. However, in the case of AI-generated inventions, it becomes difficult to assign responsibility for errors, defects, or harmful consequences. If an AI system produces an invention that leads to adverse outcomes, determining liability becomes a complex issue. Another important concern is the concentration of technological power. AI-driven innovation is often dominated by large corporations with access to vast datasets and computational resources. Granting patents for AI-generated inventions may reinforce this concentration, leading to monopolistic practices and limiting access to technology.

Beyond legal challenges, AI-generated inventions raise broader moral and ethical issues. Recognizing inventions produced by non-human entities challenges traditional notions of creativity, accountability, and responsibility. Questions arise regarding liability for harm caused by AI-generated inventions and the concentration of innovation power in the hands of technology developers. In the Indian context, ethical considerations also intersect with public interest and access concerns. Granting patents for AI-generated inventions without adequate safeguards may affect competition, access to technology, and societal welfare.

In the Indian context, these concerns are particularly significant. India's patent system has historically emphasized public interest, especially in sectors such as healthcare and agriculture. The decision in *Novartis AG v Union of India* reflects this approach, where the Supreme Court prioritized access to affordable medicines over patent protection.¹

From a policy perspective, it is essential to strike a balance between encouraging innovation and protecting public interest. This may involve implementing safeguards to prevent abuse of patent rights and ensuring equitable access to AI-driven technologies.²⁵

-
2. *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC OnLine Del 1356.
 3. World Intellectual Property Organization.

1. ²⁵ *Novartis AG v Union of India* (2013) 6 SCC 1.
2. World Intellectual Property Organization.
3. *Abbott* (n 4).

Chapter V

Policy Considerations and the Way Forward

5.1 Introduction

The growing involvement of artificial intelligence in the inventive process requires a thoughtful reassessment of India's patent framework. While existing laws have provided a stable foundation for protecting human-led innovation, they are not fully equipped to address the complexities posed by AI-generated inventions.

AI technologies are now capable of generating technical solutions with minimal human intervention, thereby challenging traditional assumptions underlying patent law. As a result, there is an increasing need to reassess whether the existing legal framework is sufficient to accommodate these developments.

Globally, jurisdictions have adopted a cautious approach by recognising AI-assisted inventions while maintaining the requirement of human inventorship. India faces a similar challenge in balancing innovation with legal certainty.

International developments further highlight this tension. Patent authorities and courts in various jurisdictions have consistently held that inventorship must be attributed to human beings. However, these decisions also acknowledge the growing role of AI in innovation, thereby exposing the limitations of existing legal frameworks. India, as a rapidly developing economy with significant technological ambitions, must carefully evaluate these global trends. The importance of addressing these issues is particularly pronounced in sectors such as healthcare, pharmaceuticals, and information technology, where AI-driven innovations are becoming increasingly prevalent. Failure to provide legal clarity may discourage investment, hinder technological progress, and create uncertainty for innovators.

This chapter examines the policy considerations relevant to AI-generated inventions and explores possible reforms to ensure that the Indian patent system remains adaptable and effective in the face of technological change.²⁶

1. ²⁶ Patents Act, 1970.
2. World Intellectual Property Organization.

5.2 Need for Legislative Reform in India

The current legislative framework governing patents in India does not provide explicit guidance on the treatment of AI-generated inventions. While the Patents Act, 1970 establishes clear standards for patentability, it operates on the implicit assumption that inventions are the result of human intellectual effort. This assumption becomes problematic in the context of modern AI systems, which are capable of generating innovative outputs autonomously.

The absence of statutory provisions addressing AI-generated inventions creates uncertainty for patent applicants, examiners, and policymakers. Without clear guidelines, applicants may struggle to determine how to attribute inventorship, while patent examiners may face difficulties in applying existing legal standards to novel technological scenarios.

The Patents Act, 1970 was enacted in an era when invention was understood as a product of human intellect. The absence of statutory provisions addressing AI-generated inventions has created uncertainty regarding inventorship, ownership, and patent eligibility. Legislative reform is therefore necessary to clarify how AI-assisted and AI-generated inventions should be treated under Indian law.

Rather than granting legal personality to AI systems, reforms could focus on defining standards for attributing inventorship where AI plays a significant role. Introducing explanatory provisions or definitions would reduce ambiguity and ensure consistency in patent examination and enforcement.

In India, legislative reform need not involve recognising AI as a legal person. Instead, targeted amendments could clarify the role of AI in the inventive process and establish criteria for determining human contribution. Such reforms would enhance legal certainty while maintaining the structural integrity of patent law.

Additionally, legislative clarity would reduce the risk of inconsistent decision-making and promote confidence among innovators and investors. As AI continues to evolve, proactive legal reform will be essential to ensure that the Indian patent system remains relevant and effective.²⁷

²⁷ □ Thaler v Vidal 43 F 4th 1207.

□ Thaler v Comptroller-General of Patents [2021] EWCA Civ 1374.

5.3 Balancing Innovation and Regulation

A central challenge in addressing AI-generated inventions lies in striking an appropriate balance between promoting innovation and safeguarding public interest. Patent law serves as a mechanism for encouraging technological advancement by granting exclusive rights to inventors. However, these rights must be carefully regulated to prevent misuse and ensure that societal interests are not compromised.

In the Indian context, this balance has been a defining feature of patent jurisprudence. The Supreme Court in *Novartis AG v Union of India* emphasised that patent protection must not be granted at the expense of public health and accessibility. This principle reflects India's broader commitment to ensuring that intellectual property rights serve the public good.

Any policy response must carefully balance the promotion of innovation with regulatory oversight. Excessive restrictions on AI-generated inventions may discourage research and investment, while overly permissive rules may undermine public interest and legal accountability.

India's patent system should encourage AI-driven innovation while ensuring that exclusive rights are granted only for genuine technical contributions. A balanced approach would involve recognizing the role of AI in the inventive process without diluting the fundamental principles of patent law, such as disclosure, non-obviousness, and industrial applicability.

Therefore, a balanced policy framework must ensure that patent protection continues to incentivise innovation while preventing the concentration of technological power. This requires careful consideration of both economic and social factors.²⁸

5.4 Recommendations for Patent Office Guidelines

In the absence of immediate legislative reform, administrative action can play a crucial role in addressing the challenges posed by AI-generated inventions. The Office of the Controller General of Patents, Designs and Trade Marks has the authority to issue guidelines that clarify the examination of patent applications involving artificial intelligence.

Existing guidelines on computer-related inventions provide a useful starting point but do not

1. ²⁸ *Novartis AG v Union of India* (2013) 6 SCC 1.
2. *Bayer Corporation v Union of India* (2014) 6 SCC 1.

adequately address the unique characteristics of AI technologies. There is a need for more specific guidance on issues such as inventorship, disclosure, and the application of Section 3(k).

New guidelines could establish clear criteria for assessing the level of human contribution required for patentability. They could also provide detailed instructions on how to evaluate AI-related inventions, particularly in cases involving complex algorithms and machine learning systems.

Such guidance would enhance consistency in patent examination and reduce uncertainty for applicants. It would also enable the patent system to adapt more effectively to technological developments without requiring immediate legislative change.²⁹

5.5 Proposals for Recognizing AI Contributions

Recognizing AI contributions does not necessarily require treating AI as a legal inventor. Instead, alternative models could be adopted, such as mandatory disclosure of AI involvement in the inventive process or acknowledgment of AI systems as contributors rather than inventors. Recognising the role of artificial intelligence in the inventive process requires a nuanced approach that does not disrupt the foundational principles of patent law. While some scholars have advocated for recognising AI as an inventor, this approach raises significant legal and practical challenges.

An alternative approach involves acknowledging AI as a contributing entity rather than an inventor. This would preserve the human-centric structure of patent law while accurately reflecting the role of AI in the inventive process.

Another important proposal is the introduction of mandatory disclosure requirements regarding the use of AI in patent applications. This would improve transparency and allow patent authorities to better assess the nature of the invention.

This approach would preserve the human-centric structure of patent law while improving transparency and accuracy in patent records. It would also allow policymakers to monitor the evolving role of AI in innovation and respond with evidence-based reforms.

5.6 Role of Judiciary and Policy Think-Tanks

The judiciary plays an important role in interpreting patent law in response to technological

1. ²⁹ Office of the Controller General of Patents, Designs and Trade Marks.

2. Patents Act, 1970, s 3(k).

change. In the absence of explicit statutory provisions, courts can provide clarity by developing principles that address AI-related disputes in a consistent and reasoned manner. Policy think-tanks, academic institutions, and expert committees can also contribute by conducting research, engaging stakeholders, and advising the government on reform options. Their involvement would ensure that policy development is informed by both legal analysis and technological expertise.

Similarly, in *Bayer Corporation v Union of India*, the grant of a compulsory licence underscored the judiciary's willingness to intervene where patent rights hinder public access.² This case illustrates that Indian courts are not reluctant to reinterpret patent rights in light of changing socio-economic realities. Such judicial flexibility may become increasingly important as courts are called upon to address disputes involving AI-assisted or AI-generated inventions. Further, the Delhi High Court in *F Hoffman-La Roche Ltd v Cipla Ltd* highlighted the importance of strict compliance with disclosure requirements, reinforcing that patent protection is conditional upon transparency and technical clarity.³ This principle is particularly relevant in the context of AI systems, where the "black box" nature of algorithms may challenge traditional disclosure norms. Courts may therefore play a key role in adapting disclosure standards to ensure that they remain meaningful in the era of artificial intelligence. Another significant contribution of the judiciary lies in interpreting the concept of "inventive step." In *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, the Supreme Court clarified that an invention must demonstrate a technical advancement that is not obvious to a person skilled in the art.⁴ As AI systems become capable of generating solutions autonomously, courts may need to reconsider how this standard is applied, particularly where the inventive contribution does not originate directly from human cognition. Beyond the judiciary, policy think-tanks, academic institutions, and expert committees play an equally important role in shaping the future of patent law in India. These bodies contribute by conducting interdisciplinary research, analysing global trends, and providing recommendations for legal reform. Their involvement ensures that policymaking is informed by both legal expertise and technological understanding. They also facilitate dialogue between stakeholders, including industry participants, legal professionals, and policymakers.

In conclusion, the combined role of the judiciary and policy think-tanks is essential in ensuring that Indian patent law evolves in response to technological advancements. While courts provide interpretative clarity and resolve disputes, policy institutions contribute to long-term reform strategies. Together, they form a critical foundation for developing a balanced and adaptive

legal framework capable of addressing the complexities of AI-driven innovation.³⁰

Chapter VI

Conclusion and Suggestions

6.1 Summary of Findings

This study examined the patentability of artificial intelligence-generated inventions with a particular focus on the Indian legal framework. The research found that while artificial intelligence plays an increasingly significant role in innovation, Indian patent law continues to rely on traditional assumptions of human inventorship. The Patents Act, 1970 does not explicitly address inventions generated autonomously by AI systems, resulting in uncertainty regarding inventorship, ownership, and patent eligibility.

Indian judicial decisions further highlight the importance of maintaining a balance between innovation and public interest. In *Novartis AG v Union of India*, the Supreme Court made it clear that patent protection should not be granted in a manner that restricts access to essential products, particularly in the pharmaceutical sector. Similarly, the decision in *Bayer Corporation v Union of India* reflects the approach that patent rights must not override public welfare. These principles are highly relevant in the context of AI, where there is a risk of concentration of technological power. The study also highlights that existing legal concepts may not easily apply to AI-generated inventions. For example, the standard of inventive step, as explained in *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries*, is based on human reasoning. However, AI-generated outputs may not follow the same logical processes. Similarly, the requirement of disclosure, emphasised in *F Hoffman-La Roche Ltd v Cipla Ltd*, becomes difficult when dealing with complex AI systems that operate as “black boxes.” At the same time, Indian courts have shown flexibility in adapting patent law to new technologies. In *Ferid Allani v Union of India*, the court recognised that computer-related inventions can be patentable if they demonstrate a technical effect. This indicates that the Indian legal system is capable of evolving in response to technological developments. The study also revealed that existing statutory concepts such as inventive step, the person skilled in the art, and disclosure requirements are difficult to apply to AI-generated inventions. Comparative analysis demonstrated that most jurisdictions globally have adopted a cautious approach, allowing

-
1. ³⁰ *Novartis AG v Union of India* (2013) 6 SCC 1.
 2. *Bayer Corporation v Union of India* (2014) 6 SCC 1.
 3. *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC OnLine Del 1356.
 4. *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.

patent protection for AI-assisted inventions while refusing to recognize AI systems as inventor. Overall, the study concludes that while artificial intelligence offers significant opportunities for innovation, the current patent framework in India requires clarification and gradual adaptation. A balanced approach is necessary to ensure that innovation is encouraged while maintaining legal certainty and protecting public interest.³¹

6.2 Concluding Remarks on Patentability

The patentability of AI-generated inventions presents a fundamental challenge to the existing structure of patent law in India. While the objectives of patent law—to promote innovation and encourage disclosure—remain relevant, their application must evolve to reflect changes in the innovation process. Treating AI purely as a tool may no longer be sufficient in cases where inventions are produced with minimal human intervention. At the same time, recognizing AI as a legal inventor raises complex issues relating to accountability, ownership, and enforcement. Until these concerns are adequately addressed, Indian patent law is likely to remain cautious in extending full recognition to AI-generated inventions. A measured and adaptive approach is therefore necessary.

In light of the issues identified in this study, it is necessary to adopt a structured approach to reforming the Indian patent framework in relation to AI-generated inventions.

1. **Legislative Clarification**

There is a clear need to clarify the legal status of AI-generated inventions within the Patents Act, 1970. Instead of recognising AI as a legal inventor, the law should define how inventions involving AI are to be treated, particularly with respect to human contribution and ownership.

2. **Development of Inventorship Standards**

Clear criteria should be developed to determine inventorship in cases involving AI systems. This will help avoid artificial attribution and ensure that patent rights are granted only where there is meaningful human involvement.

3. **Strengthening Disclosure Requirements**

In line with the principles laid down in *F Hoffman-La Roche Ltd v Cipla Ltd*, patent applicants should be required to disclose sufficient information about AI systems, including their functioning, datasets, and technical contribution.⁶ This will ensure transparency while

1. ³¹ *Novartis AG v Union of India* (2013) 6 SCC 1.
2. *Bayer Corporation v Union of India* (2014) 6 SCC 1.
3. *Biswanath Prasad Radhey Shyam v Hindustan Metal Industries* (1979) 2 SCC 511.
4. *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC OnLine Del 1356.
5. *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.

accommodating the complexity of AI technologies.

4. Patent Office Guidelines

The Office of the Controller General of Patents, Designs and Trade Marks should issue specific guidelines for examining AI-related inventions. These guidelines should clarify the application of Section 3(k) and provide standards for assessing technical contribution.

5. Ensuring Public Interest Safeguards

Indian patent law must continue to reflect the approach adopted in *Novartis AG v Union of India*, ensuring that patent protection does not adversely affect access to essential technologies.⁷ Safeguards should be introduced to prevent monopolisation of AI innovations.³²³³

6.3 Suggestions for Legal and Policy Reform

Based on the findings of this study, the following suggestions are proposed:

1. Legislative Clarification: The Patents Act, 1970 should be amended or supplemented to clarify the treatment of AI-generated and AI-assisted inventions. One of the most pressing needs is to introduce clarity within the statutory framework regarding the treatment of AI-generated inventions. The current law does not explicitly recognize or regulate inventions produced with minimal or no human intervention. Rather than granting legal personhood to artificial intelligence systems, the legislature should define the extent of human contribution required for patent eligibility. This would reduce ambiguity and ensure uniform interpretation across patent applications.

2. Establishment of Clear Inventorship Standards:

The issue of inventorship is central to patent law, as it determines ownership and rights. In the context of AI, identifying the true inventor becomes complex due to the involvement of multiple stakeholders, including developers, programmers, and users. Clear guidelines should be developed to determine who qualifies as an inventor when AI plays a significant role. These standards should focus on meaningful human contribution, thereby preventing artificial or unjustified attribution of inventorship.

3. Revision of Disclosure Requirements for AI Systems

³³ □ *F Hoffman-La Roche Ltd v Cipla Ltd.*
□ *Novartis AG v Union of india*

The requirement of full and sufficient disclosure is a fundamental principle of patent law. However, AI systems, particularly those based on machine learning, often operate as “black boxes,” making it difficult to fully explain their functioning. In line with the principles laid down in *F Hoffman-La Roche Ltd v Cipla Ltd*, disclosure requirements should be adapted to include relevant details such as training data, model architecture, and the nature of technical contribution.¹ This would ensure transparency while recognizing the technical complexity of AI systems.

4. Issuance of Specialized Patent Office Guidelines

The Office of the Controller General of Patents, Designs and Trade Marks should formulate and publish detailed guidelines specifically addressing AI-related inventions. These guidelines should clarify the application of Section 3(k), provide criteria for identifying technical effect, and outline examination procedures for AI-based patent applications. Such administrative clarity would enhance consistency and predictability in patent decisions.

5. Reinterpretation of Section 3(k) for AI Technologies

Section 3(k) of the Patents Act, 1970 excludes computer programs per se and algorithms from patentability. However, judicial interpretation, particularly in *Ferid Allani v Union of India*, has clarified that inventions demonstrating a technical effect may still be patentable.² This approach should be further strengthened through policy guidance to ensure that AI-based inventions are not unfairly excluded merely because they involve algorithmic components.

6. Safeguarding Public Interest and Preventing Monopoly

Indian patent law has consistently emphasized the importance of public interest. In *Novartis vs Union of India*, the Supreme Court highlighted the need to prevent evergreening and ensure access to essential products.³ Similarly, *Bayer Corporation v Union of India* reinforced the principle that patent rights must not override public welfare.⁴ These principles should guide reforms relating to AI-generated inventions to ensure that technological advancement does not lead to concentration of power or restricted access.

7. Encouraging Interdisciplinary and Institutional Collaboration

The complexity of AI requires collaboration between legal experts, technologists, policymakers, and academic institutions. Policy think-tanks and research bodies should be actively involved in studying the impact of AI on intellectual property law and recommending reforms. This collaborative approach will ensure that legal developments are informed by both technological realities and socio-economic considerations

8. Continuous Review and Adaptive Policy Framework

Given the rapid pace of technological change, any legal reform must be flexible and adaptive. The government should establish mechanisms for periodic review of patent laws and policies relating to AI. This will ensure that the legal framework remains responsive to future developments and does not become obsolete.

These reforms would enhance legal certainty while supporting innovation and public interest.³⁴

6.4 Future Research Directions

The evolving nature of artificial intelligence presents several avenues for future research. Further studies could examine the interaction between AI-generated inventions and other intellectual property regimes such as copyright and trade secrets. Empirical research on patent office practices and industry responses to AI-driven innovation would also be valuable. Additionally, interdisciplinary research combining law, technology, and ethics could contribute to the development of a more comprehensive framework for regulating AI-generated innovation. As AI technology continues to advance, ongoing research will be essential to ensure that intellectual property law remains responsive and effective. Future research should also focus on the technical challenges associated with disclosure requirements, especially in relation to “black box” AI systems. The requirement of full and sufficient disclosure, as emphasised in *F Hoffman-La Roche Ltd v Cipla Ltd*, may need to be re-evaluated in light of complex machine learning models.³ Interdisciplinary research involving law and computer science could help develop practical standards for disclosure without compromising innovation. Another significant area of study is the comparative analysis of global legal frameworks. Although this study has examined selected jurisdictions, future research could provide a more detailed and evolving analysis of international developments, particularly as countries begin to experiment with policy reforms relating to AI and intellectual

1. ³⁴ *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC OnLine Del 1356.

2. *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.

3. *Novartis AG v Union of India* (2013) 6 SCC 1.

4. *Bayer Corporation v Union of India* (2014) 6 SCC 1.

property. Such comparative insights would assist India in adopting best practices while tailoring them to its domestic needs.

Finally, there is scope for ethical and socio-economic research on the impact of AI-generated inventions. Issues such as access to technology, digital inequality, and concentration of innovation power require careful examination. Indian jurisprudence, as seen in *Novartis AG v Union of India*, has consistently emphasised public interest, and future research should continue to explore how this principle can be applied in the context of AI-driven innovation.⁴

In conclusion, the field of AI and patent law is still developing, and continuous research will be essential to ensure that the legal framework remains responsive, balanced, and aligned with technological progress.³⁵

Based on the findings of this study, it is evident that the existing patent framework in India requires careful refinement to address the challenges posed by artificial intelligence in the inventive process. While the Patents Act, 1970 provides a robust structure for protecting traditional inventions, it does not adequately accommodate the complexities associated with AI-generated and AI-assisted innovations. The following recommendations are proposed to ensure that the legal framework remains effective, balanced, and responsive to technological advancements.

1. Legislative Clarification: Amend the Patents Act, 1970 or introduce supplementary provisions to define the treatment of AI-generated inventions and AI-assisted contributions. There is an urgent need to clarify the treatment of AI-generated inventions within the statutory framework. At present, the Patents Act does not explicitly address whether inventions generated with minimal or no human intervention can be patented. Legislative reform should focus on defining the role of human contribution in AI-assisted inventions rather than granting legal personhood to AI systems. Such clarification would reduce ambiguity, promote consistency in patent examination, and provide greater certainty to innovators and stakeholders.

2. Inventorship Guidelines: Develop clear criteria to assess human contribution when AI plays a substantial role in the inventive process. Inventorship is a

1. ³⁵ Patents Act, 1970 (contextual reference to IP framework).
2. *Ferid Allani v Union of India* 2019 SCC OnLine Del 11867.
3. *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC OnLine Del 1356.
4. *Novartis AG v Union of India* (2013) 6 SCC 1.

central concept in patent law, as it determines both recognition and ownership. In the context of AI, identifying the true inventor becomes complex due to the involvement of multiple actors, including developers, programmers, and users. Clear and structured guidelines should be developed to determine inventorship in cases where AI plays a significant role. These guidelines should emphasize meaningful human contribution, ensuring that patent rights are not granted based on artificial or nominal attribution.

3. Issuance of Patent Office Guidelines

The Office of the Controller General of Patents, Designs and Trade Marks should issue comprehensive administrative guidelines specifically addressing AI-related inventions. These guidelines should clarify the application of existing provisions, particularly Section 3(k), and provide detailed criteria for assessing technical contribution and inventive step in AI-based inventions. Clear procedural standards will enhance transparency, reduce uncertainty, and ensure uniformity in decision-making across patent application

4. Strengthening Disclosure Standards

The requirement of full and sufficient disclosure is fundamental to the patent system. However, AI systems—especially those based on machine learning—often function as “black boxes,” making it difficult to explain their internal processes. In line with the principles established in *F Hoffman-La Roche Ltd v Cipla Ltd*, disclosure standards should be adapted to require sufficient information about the functioning of AI systems, including training data, model architecture, and technical contribution.¹ This would ensure that the invention can be reproduced while recognizing the technical complexity of AI.

5. Patent Office Guidelines

Issue administrative guidelines addressing AI-generated inventions, including procedures for examination, disclosure, and assessment of technical contribution. The importance of these guidelines extends beyond technical examination. They serve a broader policy function, aligning patent practice with national innovation goals outlined in the New Generation Artificial Intelligence Development Plan.

6. Policy and Institutional Support

The development of an effective legal framework for AI-generated inventions requires active collaboration between various stakeholders. Policy think-tanks, research institutions, and academic bodies should be encouraged to conduct interdisciplinary research and provide recommendations for reform. Their involvement will ensure that legal developments are informed by both technological expertise and socio-economic considerations, thereby facilitating evidence-based policymaking.

7. Disclosure Standards

Require transparent reporting of AI involvement, ensuring that inventions generated through opaque “black box” systems meet disclosure obligations. Indian courts have consistently emphasize the importance of adequate disclosure. In *F Hoffman-La Roche Ltd v Cipla Ltd*, the Delhi High Court held that insufficient disclosure can be a ground for refusing patent protection.¹ Applying this principle to AI-generated inventions, it becomes clear that failure to explain the functioning of AI systems may result in non-compliance with statutory requirements under the Patents Act, 1970.

8. Policy and Institutional Support

Encourage engagement with think-tanks, research institutions, and technologists to provide ongoing recommendations for AI and IP law. The involvement of such institutions would facilitate evidence-based policymaking by providing insights into global developments, industry practices, and emerging technological trends. These bodies can also act as advisory platforms, assisting the government and the Office of the Controller General of Patents, Designs and Trade Marks in formulating guidelines and reforms related to AI and intellectual property law. In the Indian context, where judicial interpretation has often filled legislative gaps, collaboration between policymakers and research institutions can help anticipate future challenges rather than merely responding to disputes after they arise. This proactive approach would strengthen the legal framework and ensure that it remains aligned with technological advancements.

9. Ethical Safeguards

Consider public interest, equitable access, and accountability when granting patents for AI-assisted or AI-generated inventions. Indian patent jurisprudence has consistently emphasised the importance of public interest. In *Novartis AG v Union of India*, the Supreme Court highlighted that patent protection should not be granted in a manner that restricts access to essential goods.² Similarly, in *Bayer Corporation v Union of India*, the grant of a compulsory licence reinforced the principle that public welfare must prevail over private patent rights.³ These principles are particularly relevant in the context of AI-generated inventions, where there is a risk that a small number of entities may control advanced technologies. Ethical safeguards should therefore be incorporated to ensure equitable access, fair competition, and accountability.³⁶

-
1. ³⁶ *F Hoffman-La Roche Ltd v Cipla Ltd* 2008 SCC Online Del 1356.
 2. *Patents Act, 1970*.
 3. *Office of the Controller General of Patents, Designs and Trade Marks*.
 4. *Novartis AG v Union of India* (2013) 6 SCC 1.
 5. *Bayer Corporation v Union of India* (2014) 6 SCC 1.

Overall Conclusion

Artificial intelligence is rapidly transforming the global innovation ecosystem, generating inventions that challenge the traditional, human-centered foundations of patent law in India. The current framework under the Patents Act, 1970, presumes that inventors are natural persons, capable of exercising legal rights, disclosing inventions adequately, and fulfilling statutory obligations. AI-generated inventions disrupt these assumptions by producing novel solutions autonomously or through complex algorithmic reasoning that often transcends conventional human problem-solving. This creates significant uncertainty regarding core legal concepts, including inventorship, inventive step, and disclosure, raising urgent questions about ownership, accountability, and the scope of patent protection.

Indian jurisprudence reflects a capacity for adaptability in the face of technological advancement. Landmark cases such as *Ferid Allani v Union of India* and *Novartis AG v Union of India* illustrate that the judiciary is willing to interpret patent law flexibly, balancing the need to encourage innovation with broader public welfare considerations. These precedents suggest that India possesses the institutional readiness to accommodate AI-driven inventions, provided the legal framework evolves to explicitly address these emerging realities.

The imperative for reform is clear. Legislative and policy interventions are needed to: (i) redefine inventorship to recognize the role of AI while anchoring legal rights in natural persons or legal entities; (ii) recalibrate the assessment of inventive step to account for AI's computational creativity; (iii) establish disclosure standards that ensure transparency, reproducibility, and accountability of AI-generated innovations; and (iv) prevent monopolization of AI technologies while promoting equitable access to the benefits of innovation. Such reforms would create a balanced, forward-looking patent ecosystem that aligns with both technological progress and societal interests.

In conclusion, AI-generated inventions present both a profound challenge and a transformative opportunity for India's intellectual property framework. By embracing carefully structured legal reforms, India can position itself as a global leader in the governance of AI-driven innovation, incentivizing creativity, protecting public welfare, and ensuring that its patent system remains robust, equitable, and future-ready. This evolution is not merely a regulatory

necessity—it is a strategic imperative for fostering a sustainable and inclusive innovation-driven economy in the age of intelligent machines.

As artificial intelligence continues to advance at an unprecedented pace, the legal and policy frameworks governing intellectual property must evolve in tandem, adopting an adaptive and forward-looking approach. The Indian patent system, in particular, faces the critical challenge of balancing dual objectives: incentivizing cutting-edge innovation while safeguarding public interest. Autonomous and semi-autonomous AI systems complicate traditional concepts of inventorship, disclosure, and inventive step, making it essential for the legal framework to remain flexible, technologically informed, and ethically grounded.

Future reforms will demand interdisciplinary collaboration among legal scholars, patent examiners, technologists, policymakers, and academic institutions. Such collaboration is essential to ensure that regulations and patent office procedures reflect both the technical realities of AI-generated innovation and broader socio-economic and ethical considerations. Legal adaptation cannot occur in isolation—it must integrate insights from computer science, data ethics, innovation management, and public policy to create a holistic governance model.

Moreover, continuous empirical research will be critical for building a responsive and resilient patent ecosystem. Systematic studies of AI patent applications, evolving international legal standards, and technical disclosure practices will provide the evidence base required for data-driven policy interventions. Monitoring global trends, including innovative approaches in jurisdictions such as China, the United Kingdom, and the United States, will allow India to adopt best practices while maintaining its strategic policy priorities.

Ultimately, this study emphasizes that AI is far more than a technological tool; it is a transformative driver of innovation that necessitates legal, institutional, and ethical preparedness. By adopting a proactive, adaptive, and principled approach, India can fully harness the potential of AI-generated inventions, ensuring that innovation is equitable, transparent, and aligned with public welfare. Such foresight will position India as a global leader in AI innovation governance, creating a patent ecosystem that is not only future-ready but also socially responsible and strategically robust.

BIBLIOGRAPHY

A. Statutes and Legislative Materials

The Patents Act 1970 (India).

The Patents (Amendment) Act 2005 (India).

Patents Act 1977 (UK).

United States Patent Act, 35 USC § 100.

Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement).

B. Cases

Novartis AG v Union of India (2013) 6 SCC 1.

Bayer Corporation v Union of India (2014) 6 SCC 590.

Biswanath Prasad Radhey Shyam v Hindustan Metal Industries (1982) 1 SCC 511.

F Hoffmann-La Roche Ltd v Cipla Ltd (2015) 225 DLT 391 (Delhi HC).

Ferid Allani v Union of India 2019 SCC Del 11867.

Thaler v Vidal 43 F 4th 1207 (Fed Cir 2022).

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

Commissioner of Patents v Thaler [2022] FCAFC 62.

C. Books

Abbott R, *The Reasonable Robot: Artificial Intelligence and the Law* (Cambridge University Press 2020).

D. Journal Articles

Abbott R, 'I Think, Therefore I Invent: Creative Computers and the Future of Patent Law' (2016) 57 *Boston College Law Review* 1079.

Bridy A, 'Coding Creativity: Copyright and the Artificially Intelligent Author' (2012) 5 *Stanford*

Technology Law Review 1.

Gervais D, 'The Machine as Author' (2019) 105 *Iowa Law Review* 2053.

E. Reports and International Materials World Intellectual Property Organization (WIPO), *Technology Trends: Artificial Intelligence* (2019).

World Intellectual Property Organization (WIPO), *Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence* (2020).

United States Patent and Trademark Office (USPTO), *Artificial Intelligence and Inventorship Guidance*.

European Patent Office (EPO), *Guidelines for Examination*.

China National Intellectual Property Administration (CNIPA), *Patent Examination Guidelines* (2020).

F. Bibliography World Intellectual Property Organization (WIPO) <https://www.wipo.int>

United States Patent and Trademark Office (USPTO) <https://www.uspto.gov>

European Patent Office (EPO) <https://www.epo.org>

Indian Patent Office <https://ipindia.gov.in>

UK Intellectual Property Office <https://www.gov.uk/ipo>