PATENT LAW & AI: RETHINKING INVENTORSHIP IN THE AGE OF MACHINE INNOVATION

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ABSTRACT

AI development at a rapid pace is giving a different shape to the innovation landscape, and at the same time, raising many concerns about the appropriateness of current intellectual property frameworks, especially patent law, in identifying and securing inventions created by AI. The concept of inventorship, which is generally characterized by human creators associated with patent laws worldwide, is at the center of this debate. Augmented human creativity and the ever-growing abilities of AI lead to redefining the law and giving legal safeguards new meanings.

The patency rights and inventorship issues are mainly handled by *The Patents Act, 1970*, in India. However, the Act's general provisions create a quandary for AI-generated inventions since, in effect, they presume that the inventor is a human being. This treatment of AI and machine-generated intellectual property is heavily influenced by an interconnected legal framework, which consists of *The Patents Act, The Copyright Act of 1957, The Information Technology Act of 2000, and new data privacy legislation.* In combination, these laws change the ways of the disclosure, protection, and commercialization of the technologies related to AI.

The US, the EU, the UK, and other areas have similar issues and as a result, they are experimenting with different doctrinal interpretations and policy changes. The complications of the case are highlighted by the difference between doctrinal legal analysis and the empirical observations of experts from various fields and legal practitioners. *The issues discussed most prominently include legal accountability, ownership rights, ethical consequences, and the potential introduction of sui generis regimes or changes in inventorship models.*

These issues can be resolved only by adaptive legal frameworks that have the potential to *balance invention, justice, and accountability,* which are the three primary goals of patent law. These very frameworks need to change so as to be able to accommodate the reality that there will be machine innovations if law wants to remain timely and relevant in a world of artificial creativity..

Keywords: AI, Inventorship, Accountability, Sui Generis Regimes

AIM AND OBJECTIVES

The objective is to assess the legal concept of inventorship under the existing patent law regime, primarily in India, considering the rising trend of artificial intelligence (AI) contribution to patentable inventions. The research combines doctrinal and non-doctrinal methodologies to map out the extent to which the Indian Patents Act, 1970, and the related laws are fit for AI-developed inventions. It involves an examination of the means of recognizing inventorship in the past, a thorough legal critique of the statutes and the court decisions, and analysis of the empirical data collected through structured surveys administered to the participants.

Machine-generated inventions era, the primary goal, is to find out if ***the law needs to be sensibly altered so that the equilibrium between innovation, accountability, and legal certainty is maintained.***

Objectives:

To understand how the human-centric perspective of inventorship has been developed throughout the years, it is crucial to look at the historical progression of the concept of inventorship in the Indian and the international Patent systems, respectively. This paper firstly aims to review the Indian Patents Act of 1970 and associated legal provisions such as the Information Technology Act of 2000, and the Copyright Act of 1957 from a doctrinal perspective to check the feasibility of the law regarding AI inventions. Further, this paper is a comparative study of the legal and legislative perspectives on artificial intelligence origin in other countries (such as US, UK, and EU) to locate the best practices and the reform models which are helpful in the Indian context. At the same time, a structured questionnaire was designed with the objective of gathering empirical input from various stakeholders, such as the academic experts, legal professionals, patent examiners, and technology sector actors, as to the Artificial Intelligence - generated inventions real-world applications, issues, and possible solutions. Moreover, it will also be involved in the assessment of the reform proposals and determination of other possible Indian patent system implications such as co-inventorship models (human + AI) introductions, the creations of sui generis protection regimes, or amendments of the current statute. Finally, this paper is going to present a comprehensive legal framework that bridges Indian patent law with novel technical realities, thus maintaining the principles of responsibility, accurate attribution, and innovation encouragement during the era of artificial intelligence.

RESEARCH QUESTIONS:

1. What changes have been made to the concept of inventorship in Indian patent law, and does the Patents Act of 1970 recognize the establishment of artificial intelligence (AI) systems as well as other non- human inventors?

2. How do courts interpret AI, generated inventions concerning chief judicial interpretations of inventorship?

3. In what ways is the issue of AI inventorship in Indian patent law treated differently as compared with the various international jurisdiction those are the US, UK, and EU? What comparative insights can be gained from these differences?

4. What are the practical problems and various stakeholder views (including views of legal experts, patent professionals, and people from different fields) on the patent rights given to AI, generated inventions, and what legislative changes can efficiently resolve these issues?

HYPOTHESIS

The Patents Act, 1970 India's patent system is no longer sufficient to accommodate inventions created solely by AI as it confines inventorship to human beings. The lack of explicit clauses in associated statutes, such as the Copyright Act, 1957 and the IT Act, 2000, makes the identification of AI generated works even more difficult. A study of international precedents (U.S., U.K., EU) along with the opinion of stakeholders indicates the requirement for a forward looking legislation, either by redefining the term "inventor" or by providing sui generis protection, to grant legal stability, a positive climate for inventions, and fair access to rights in the era of AI driven invention.

RESEARCH METHEDOLOGY

This research aims to conduct a thorough investigation of AI inventorship as per the patent law of India. To do this, it employs a ***hybrid methodology*** which essentially combines doctrinal and non-doctrinal (empirical) research methodologies.

Doctrinal Research: Refers to the study of court decisions in India and other similar

jurisdictions (US, UK, EU) alongside primary legal documents like the Patents Act 1970, Copyright Act 1957, and Information Technology Act 2000. Besides, it is also reviewing publications and policy documents of foreign countries.

Non-Doctrinal Research: This method gathers empirical data from stakeholders, such as academics, legal experts, patent examiners, and people from different fields, employing a standardized questionnaire. Consequently, it becomes easier to assess ground-level problems, opinions of AI inventorship, and the legislations changes necessity.

Comparative Analysis: Examines how foreign law deals with AI inventorship to determine the best practices that India can implement.

LITERATURE REVIEW

Books:

1. ***"Research Handbook on Intellectual Property and Artificial Intelligence"[1]:*** This book concentrates on the regime of patents and provides a complete multidisciplinary look at the interplay of AI and IP. It inquires how inventorship in general which has always been off human creativity and action is suddenly challenged by artifices made by AIs. Several chapters in this book discuss the implications of considering AI as a new source of invention and analyze in depth the defects of the current legal framework in that respect. Among the core issues are the grant of legal entity status, the proposal for attributing intellectual property to AI, and the economists arguments for a change in the patent system.

   The book also contains comparing perspectives from such countries as the US, UK, and EU; the author focuses the reader's attention on such events as the DABUS case history. These debates lay the groundwork for fathoming how different legal frameworks react.

   Criticize the human-centered presumptions incorporated in the traditional patent systems and discuss the logical and practical possibility of non-human entities being recognized as inventors. Examples of chapters are "*Legal Fictions and the Corporation*

[1] *Ryan Abbott, Research Handbook on Intellectual Property and Artificial Intelligence, 1st edn, Edward Elgar Publishing, Cheltenham, UK, 2022.*

as an Inventive Artificial Intelligence, and Economic Reasons to Recognize AI Inventors"

The text combination of doctrinal critique, policy analysis, and theoretical reflection makes it extremely relevant for research that aims to reform Indian patent law in the context of machine-led innovations. It is a starting point for the comprehension of the global discussion about the necessity of adaptation of intellectual property regulations due to AI developments.

2. ***"Amalgamation of Artificial Intelligence and Intellectual Property":*** [2] The book is a complete literary exegesis, and, by focusing on the Indian legal system, it charts the evolving interface between the use of Artificial Intelligence (AI) and the Intellectual Property (IP) law. Besides discussing the trouble that AI as a non-human (artificial) entity discovers close to the concept of law and the assignment of rights, it also significantly dissects the traditional intellectual property (patents) systems.

   Firstly, it examines the limitations of the Patents Act, 1970, pointing out the hidden implication that inventors should be human beings. Also, it shows that, in spite of rapid technical advancements, especially in the areas of autonomous and generative AI systems, the Indian IP law still holds on to its doctrinal rigidity. Furthermore, in order to facilitate the potential legal changes, the analysis also considers the extent to which present IP categories like copyright and trade secrets may be insufficient to protect AI-generated outputs.

   The references to the global trends serve as a bed to nurture the debate which is located in Indian jurisprudence. To give a hint on how India can make its intellectual property law more compatible with machine-led innovation, the paper provides a brief overview of co-inventorship models, accountability frameworks, and policy-level issues in this area.

3. ***"Copyright and Patent Laws for the Age of Artificial Intelligence: Authorship and Inventorship Revisited"[3]:*** Besides the main focus on the increasingly complicated sign

[2] *Pavan Kumar R., Amalgamation of Artificial Intelligence and Intellectual Property, 1st edn, Iterative International Publishers, Bangalore, 2023*
[3] *Eva Janeckova, Copyright and Patent Laws for the Age of Artificial Intelligence: Authorship and Inventorship Revisited, 1st edn, Hart Publishing, London, 2025*

of a human origin in the products created by AI, this work also delves deeply into the statutes and doctrinal bases of authorship and inventorship in the European copyright and patent regime, with a special emphasis on the UK, Germany, and France. The paper claims that defining human concepts and using human language forms can no longer explain the creative output of AI-infinitely-growing independent AI systems.

The paper offers a historical overview of the influence of ideals like originality, technical character, and expressive form on the field of IP law and uses this to provide a doctrinal critique of the present legal norms. It evaluates whether current practices might lead wrongly to the awarding of rights in cases of statutory legitimacy and strongly suggests making conceptual and doctrinal changes. It proposes the particular reform directions that could be most suitable for the adaptation of AI-generated works to the changing nature. It not only rehears the theoretical material but also implicitly asks for more general concepts to be applied as an aid to the law reform process in India.

Articles/Reports:

1. ***World Intellectual Property Organization (WIPO), "Artificial Intelligence and Intellectual Property":*** [4]This article examines in-depth the impact that AI technology has on the existing intellectual property (IP) systems worldwide, which are significantly transformed. It extensively analyzes that just the very nature of the AI systems-driven inventions is a big threat to the whole set of IP concepts that are known, first of all the ones of inventorship and patentability. Using several examples from different countries, the article elucidates the present differences and the existing gaps between the way judges and patent offices perceive the matter of AI involvement in the creative process. The biggest units of discussion are the legal definition of an inventor in accordance with patent law, the criteria that AI-generated ideas have to meet to be considered patentable inventions, as well as the implications of ownership and responsibility for when technology is the major factor of innovation. One of the vital points of the research is that it offers policy recommendations highlighting the importance of the legislators, IP offices, and stakeholders considering them in order to bring in reforms

[4] *World Intellectual Property Organization (WIPO), Artificial Intelligence and Intellectual Property, WIPO, Geneva, 2019.*

that are well coordinated for striking the right balance between innovation incentives, equity, and legal clarity. They involve the absolute necessity of international cooperation for the purpose of coordinating the different approaches to AI and IP, the concept of sui generis rights, and more.

Besides, the paper is an important source that helps understanding the evolving issues in the field of patent law caused by AI, and also serves as a valuable reference point for comparative legal research, which aims at designing adaptable and progressive IP policies.

2. **"*Improving Intellectual Property*"[5]:** This chapter looks into the essential question of whether patent law should allow artificial intelligence (AI) to be named as an inventor. It identifies that the foundation of today's patent systems is the concept that creators are human beings by nature. The chapter questions if this idea still holds water given the fact that AI systems are able to come up with novel and useful inventions entirely on their own without any human intervention. It further outlines the concerns that machines might be given the rights of inventorship and what changes in the law, if any, should be made. Moreover, the chapter gives you an insight into the sufficiency of the present laws, such as The Indian Patents Act, 1970, in accommodating cutting-edge technologies and what kind of amendments are necessary to make these laws fair and viable in the age of AI.

Case Law:

Thaler v. Comptroller General of Patents, Trade Marks and Designs[6]: In 2018 saw DABUS (Device for the Autonomous Bootstrapping of Unified Sentience), an AI system, named as the only inventor in two patent applications brought by Dr. Stephen Thaler to the UK Intellectual Property Office (UKIPO). The two inventions i.e. a food container, and a beacon with flashing lights, were initially introduced to the public by DABUS but without any human input were said to be created by it.

[5] *Daniel J. Gervais, "Artificial Inventors" in Susy Frankel, Margaret Chon, Graeme B. Dinwoodie & Frederick M. Abbott (eds), Improving Intellectual Property, Edward Elgar Publishing, Cheltenham, 2023, p. 224*
[6] *Thaler v. Comptroller General of Patents, Trade Marks and Designs, [2021] EWCA Civ 1374 (Court of Appeal, UK)*

On his form, Dr. Thaler definitely stated that no human work had been done on the innovative step with which he, therefore, asserted patent ownership as the creator and owner of DABUS and not as an inventor. Since inventors have to be natural persons as stipulated in the Patents Act of 1977, the UKIPO, therefore, rejected the applications. Statutorily speaking, DABUS is non-human and thus cannot be considered an inventor. The question of a non, human inventor was combined with the fact that Thaler did not want to indicate a human inventor, so the files were considered as an improper and illegal filing. The High Court agreed with the decision, which was taken to the Court of Appeal for a hearing. The Court of Appeal decided by a split decision (2:1) to respond to that appeal. The majority pointed out that the necessity of physically identifying a human inventor as UK law is clear. It further emphasized that even if AI can constitute an essential creative stimulus, the current legal system cannot assign to a machine the attributes of inventorship or transfer of rights as it can be done with a human.

The case has raised a number of issues related to the future of patent law, which include:

- Should the law recognize non-human innovators?
- What impacts may such recognition have on the existing concept of ownership and intellectual property?
- What changes shall the patent system reflect for it to be still considered as one, whose main objective is the promotion of innovation by humans, while machines are the ones to create mostly?

Chapter 1 - FOREWORD

Research Aim and Objectives

The invention of artificial intelligence (AI) as the prime mover of innovation is challenging the customary notions about patent law which have been dominant for a long time. It is generally believed that inventions should be the result of the logical and creative human activities hence the attribution of the inventorship to humans only. The laws governing the patent systems all over the globe have been shaped by the approach which gives exclusive credit to humans. But the performance of the AI systems has been moving towards independence and they are now able to come up with new solutions, create new inventions and simplify processes without human guidance. The current legal regime which limits the claims of inventorship to natural persons is questioned by these changes.

The principles of inventorship and ownership that are still evident in the Patents Act of 1970 remain true of India. Nevertheless, it is necessary and is increasing with the pace of AI in research and development across industries to find out if the Indian legal system can handle ideas created by or profoundly influenced by AI. Cases like those involving the AI system "DABUS" are such examples that have led to discussions across the globe and different countries have reacted differently indicating that the issue is still far from being settled in this jurisdiction.

This paper intends to analyze to what extent the patent system of India can suitably tackle unexpected issues in the field of technological innovation caused by AI. The broad goals of this research are:

- The investigate of one the most disputed issues in patent law - the concept, scope and development of inventorship.

- Legal research in India with the aim of reviewing the scope of the Patents Act of 1970, examining current case law, and analyzing new policy debates.

- Benchmarking the Indian research against international regulations such as those of the US, EU, UK, and other prominent jurisdictions.

- The research of the possible changes of AI in the traditional notions of ownership and inventorship through the viewpoints of such stakeholders as researchers, industry professionals, and legal experts.

- Rehabilitation ideas on the topic of creativity, accountability, and moral considerations in the era of AI-generated technology.

By this study, the research hopes to contribute to the present global debate and at the same time provide insights that are uniquely relevant to the legal and technological scene in India.

Extent & Importance of Study

One of the changes that have been caused by advanced artificial intelligence is that it can now invent things by itself. As a result, the traditional concepts of inventorship, ownership, and patentability have been overturned by AI. This paper is very important for the legislators, the patent offices, the legal professionals, and the technological innovators who need a clear answer on how the current intellectual property frameworks apply to AI-driven inventions.

The research delves into the doctrinal as well as the practical aspects, deeply exploring the accommodation of the existing patent laws by AI-generated inventions or the failure thereof. It points out various legal uncertainties like the occurrence of AI as an inventor and further consequences on patent ownership rights, enforcement, and liability. The research, in providing a thorough examination of such matter, gives an outline to policy accommodation, legislative reformation, and strategic stakeholder decision in the innovation ecosystem. The study, in essence, is attempting to make the transition from the ever-changing technology to the current legal framework, thus patent law can be still effective, fair, and responsive in the era of machine-led innovations.

Chapter 2 - ANALYTICAL FRAMEWORK - INTERPRETATION, SCOPE, AND EVOLUTION OF INVENTORSHIP

❖ *Meaning and Legal Notion*

Section 2(1)(j) – Definition of '***Invention***'[7]

The Patents Act, 1970, defines an "invention" as:

" a new product or process involving an inventive step and capable of industrial application."

This section, while it does not directly define the term "inventor," outlines the basic

[7] *The Patents Act, 1970 (Act No. 39 of 1970, India).*

characteristics of an invention and, hence, indirectly lays down the features of the inventorship.

Section 6 – *Persons Entitled to Apply for Patents*[8]

The question of who may apply for a patent is dealt with in Section 6:

"An application for a patent may be made by any of the following persons, that is to say-

a) by any person claiming to be the true and first inventor of the invention;

b) by any person being the assignee of the person claiming to be the true and first

c) inventor in respect of the right to make such an application

With this provision, the person who is the first and true inventor is the one who is recognized as being entitled to apply for a patent, hence, the role of the inventor in the patenting process is acknowledged.

Distinction Between Inventorship and Ownership

- ***Inventorship***

The distinction between the inventorship and the ownership is that the first one is a matter of the intellectual contribution to the conception of the invention. Inventorship is identified by the input to the inventive concept and, hence, it cannot be subject to the transfer or assignment of rights. An inventor is the one who has added an original thought to the invention process.

- ***Ownership***

Ownership, on the other hand, is about the legal rights that go along with the patent. The patent rights can be sold, handed over, or rented; however, the process of determination of inventorship will not be affected by that. The inventor is still the one who has done the research work notwithstanding any ownership rights.

[8] *The Patents Act, 1970 (Act No. 39 of 1970, India).*

Indian Patent Office's Stance on AI as an Inventor

- ***Background***

The Indian Patent Office (IPO) reacted with one of the most prominent cases when it dealt with the issue of AI as an inventor in patent applications. The IPO did not allow it to recognize an AI system as an inventor.

The provisions cited that the Patents Act, 1970, Sections 2 and 6 as the grounds for the objection:

According to Section 6 a "***person***" should be referred to as the one who either the true and first inventor or an assignee is, and the patent application must be filed by him/her.

- ***Significance***

This is a big deal because it is one of the first times that the IPO has made it very clear that it sees the problem of AI as an inventor. This is not a court ruling but rather a decision of the administration that points out the difficulty of the current legal set-up in accepting inventions generated by AI. The message is clear: law and policy must evolve in step with technology.

❖ *The Evolution of Inventorship in Patent Law*

- ***Historical Background***

One of the defining features of modern patent systems which in documents goes as far back as the 15th century, was the acknowledgment and encouragement of inventors' ingenuity with the granting of patents. Through and through, the laws in those times emphasized that inventions were the sole creations of inventors who came up with the product or solution in their own minds, thus reflecting the perception of innovation as being the outcome of an individual inventiveness. With the onset of the Industrial Revolution and the change in scientific practices from individual to group research, the phenomenon of shared inventors started being recognized, thus the concept of multiple inventors as a result of the joint breakthrough in science and technology.

- ***Evolution Across Jurisdictions***

India:

Inventorship in India is regulated by ***the Indian Patents Act, 1970***[9]. In the first place, ***section 6*** demarcates "***true and first inventor***" as the one qualified to file for a patent covering a novel invention combination. Somewhat in line with requirement restriction in law, However, Indian Law permits jointly inventors where the inventive accomplishment of more than one individual is the driving premise. On numerous occasions, Courts indicated that inventorship means giving substantive ideas, not mere execution or even a lack of direct supervision and that calculating intellect is still required even in the usage of the computer-assisted technology.

European Union (EU)

According to the ***European Patent Convention (EPC), 1973***[10], those individuals who have done the breakthrough to the invention are the ones to whom inventorship is credited. Unlike in India where multiple inventors are allowed, the EU put more *emphasis on human input in line with the worldwide concept of one person being the brain behind the invention.* Hummingbird drones are only assisted with nonhuman devices such as robots and computers, but the creativity and the final touch come from the designer, and that is why the identifications of humans as inventors are not questioned in the facilitation of AI unless the assistant is fully automated and the human is just supervising the process.

United States (US)

The ***U.S. Patent Act, Title 35*** [11]in the United States accepts inventors as "*individuals who bring about the invention idea*". The U.S. law also provides for multiple inventors. In a case like *Falkner v. Inglis*[12] and similar ones, the court has been very clear that inventorship is based on the idea of creation and not on reduction to practice, and thus, none of the acts of labor, funding, or supervision alone can grant the status of an inventor.

[9] *The Patents Act, 1970 (Act No. 39 of 1970, India)*
[10] *European Patent Convention, 1973 (Convention on the Grant of European Patents, Munich, 5 October 1973, entered into force 7 October 1977).*
[11] *United States Patent Act, Title 35, United States Code (USC)*
[12] *Falkner v. Inglis, 448 F.3d 1357 (Fed. Cir. 2006)*

United Kingdom (UK)

Similar to the others, in the UK under ***the Patents Act, 1977***[13], the natural human inventors who generate the inventive concept idea are the ones who get credited. In UK, AI-generated inventions have already posed problems as in the *Thaler v. Comptroller-General of Patents (2021)* case when the court decided that a creation made by an AI system cannot be given the status of an inventor. The human nature of the intellect remains at the core of the UK intellectual property law as one can see.

- ***Inventorship in the Technological Era of AI***

Artificial intelligence complicates the matter to a great extent as it challenges the usual legal description of inventorship. The main idea of the AI system is to be able to do the following without the need for direct human intervention: data analysis, hypothesis testing, and creation of new items. The capability of the technology asks numerous vital questions for the patent law.

- Could we consider an AI system as one of the "actual devisers" under the current statutory frameworks?

- But how is it supposed that any person, intent or mental conception be attributed if the inventions are created autonomously by algorithms?

- In the event of an AI, generated invention, which entity is legally liable for causing a violation, error, or misuse if the invention is propagated or is being sold?

Different interpretations and practices of patent offices have emerged due to the absence of clear statutory provisions that define the role of AI in the inventive process. Generally, it is agreed that AI can be a great tool to the human inventors. Nevertheless, it is a question that still remains unresolved before the law whether AI systems should be considered as inventors and given an official recognition. The problems raised by this scenario point to the necessity of juridical resolution, lawmaker guidance, and policy alterations, which indicate that the patent law system acknowledges AI as a technology capable of generating innovations.

[13] *Patents Act 1977 (c. 37, United Kingdom)*

Chapter 3 - CRITICAL ANALYSIS OF LEGAL DOCTRINES AND CHALLENGES IN THE INDIAN LEGAL SYSTEM

❖ *Analysis of the Patents Act, 1970 and Related Laws*

The Patents Act, 1970 is the core law that regulates patent protection in India and is one of the main components of the country's intellectual property landscape. The scope of its operation is, through the provision of the exclusive rights to the inventor, to make the world wait for a specified period for his creation, thus enticing research and investment, to thereby, in turn, promote innovation and technological advancement.

Section 2(1)(j) – Definition of '***Invention***'

The Act refers to invention as:

"a new product or process involving an inventive step and capable of industrial application."

Though the phrase "***inventor***" is not directly mentioned in the law, it gives the basis for patentable subject matters with the dominant feature being human creativity for an invention impliedly.

Section 6 – Persons Entitled to Apply for Patents

True and first inventors are identified in Section 6 as the primary patent applicants. It empowers patent applications to be filed by:

Themselves, the creators; or the assignee of the inventors.

This article not only assures the rightful allocation of inventors but also matching of legal recognition with actual creative contribution.

Section 7 – Requirements for Patent Application

This part requires an inventor to submit a statement describing their contribution to the invention. It is enshrined that during patent claim, transparency with traceability, and verifiability is kept, and stalking of ownership or inventorship disputes is also checked.

Alignment with International Obligations

India's patent system is TRIPS compliant (1994) through its patent rules and regulations harmonized with its international obligations. The said Agreement demands a patent protection that must be ***consistent, enforceable, and non-discriminatory*** from member states. Accordingly, the conjunction of ***Sections 2, 6, and 7*** present the ideals of openness, responsibility, and respect for the creative power of humans, thus going a step further in ensuring that global standards are met.

- ***Regulations concerning Inventorship in Indian Patent Law***

The innovation of AI technologies through to their conception has brought with it a plethora of confounding factors that are often not clear in the Act, such as the task of keeping the credit for the inventions done by AI not human. In other words AI, based on its knowledge, ability for self-learning only, can come up with new product or process without needing any human assistance, which of course is way of thinking not so easily adapted to present legislation.

In addition, when AI substantially assists in the creation of an invention, it remains to be established who will take responsibility for mistakes, infringements, or misuses. Moreover, human-declared and signed patent disclosures required by Sections 6 and 7 lead to procedural hurdles concerning AI-driven innovations.

To sum up, the more AI gets involved with the invention of new and novel things, the more challenges arise as to how Patents Act, 1970 will be interpreted and even how some of its principles may be questioned and this, in turn, invites not only ruling policy clarity and lawmaking but also amendments that can cater for AI-driven inventions in the Indian patent system without jeopardizing its sanctity.

- ***Correlations with Copyright Act, IT Act, and Data Protection Laws***

Artificial Intelligence (AI) systems are data-driven to a great extent, which leads to several problems under different legal frameworks in India.

- ***The Copyright Act, 1957[14]: Data Use and AI Training***

[14] *The Copyright Act, 1957 (Act No. 14 of 1957, India)*

The Copyright Act, 1957, explains the limitations and possibilities of the usage of copyrighted materials in India. To be more specific, AI training usually requires the reproduction and adaptation of copyrighted materials, thus, in the most cases, machine learning developers violate the copyright laws. The Indian copyright legislation as of now does not clearly define the permissible use of copyrighted data for AI training. This vagueness causes various legal ambiguities. As an example, the Indian government formed a committee to evaluate if the existing Copyright Act is sufficient to manage the issues emerging from the interaction between AI and copyright, particularly those that result from the by way of AI platforms like OpenAI, etc.

- ***Information Technology Act, 2000[15]: Cybersecurity and Liability***

The Information Technology (IT) Act, 2000, is mostly about identifying illegal activities in the virtual world, that is, cybercrimes and electronic trading. The act is a key enabler of online security and also provides a safe environment for data intermediaries, however, it doesn't have any bespoke sections dealing with the creation of AI content or with the accountability of the AI invention process. Such a concern is at the root cause of the problem of fault finding among AI driven technologies and violators of probable rights.

- ***Digital Personal Data Protection Act, 2023[16]: Data Processing and AI***

The Digital Personal Data Protection Act, 2023 (DPDPA) stipulates that the handling of personal data be done in a sensible, fair, and open way. It stipulates that the explicit consent of the person whose data is to be dealt with should be obtained, with a few exceptions. Still, there are ambiguities relating to the DPDPA's accountability for AI training data, especially concerning anonymized or non-personal data. The Internet and Mobile Association of India (IAMAI) has requested the government to exempt the data fiduciaries involved in AI training from the DPDPA provisions and has contended that the AI fueled revolution might be restrained if the provisions are not relaxed.

❖ ***Judicial Interpretations and Government Policies on AI and IP***

It is true that in India, no court decision directly dealing with artificial intelligence as an

[15] *The Information Technology Act, 2000 (Act No. 21 of 2000, India)*
[16] *The Digital Personal Data Protection Act, 2023 (Act No. 25 of 2023, India)*

inventor has been found, but courts, in general, have reiterated that patents have to reflect human intellectual inputs. An instance is the court decision in *Novartis AG v. Union of India (2013)* [17], which emphasized that the inventive step acknowledged by the patent office should be the outcome of the human mind problem, solving process.

The Government of India, after discussions with such bodies as the World Intellectual Property Organization (WIPO) and the Department of Industrial Policy and Promotion, has recognized the growing role of AI but has not yet proceeded to suggest any changes in the legislation. The present consultations reflect the necessity of a regulatory approach that is careful rather than of a radical nature.

- ***Landmark Judgments, Reports, and Articles***

Case Laws:

- ***Thaler v. Commissioner of Patents[18]***

Facts:

Stephen Thaler, Ph.D. and along with an artificial intelligence system called DABUS (Device for the Autonomous Bootstrapping of Unified Sentience), managed to submit patent applications in Australia identifying DABUS as the inventor.

These submissions by the Australian Patent Office were refused on the ground that only humans, as defined by the Patents Act 1990, were eligible to be considered inventors.

Judgement:

Justice Beach, Judge of the Federal Court, concluded that the term "inventor" found in the Patents Act 1990 is an entity with which AI is included, therefore, DABUS can be considered an inventor.

Nonetheless, the court pointed out that the applicant for the patent must be an individual. Therefore, Dr. Thaler was given the green light to be the owner of the patent and holder of the

[17] *Novartis AG v. Union of India, (2013) 6 SCC 1 (India)*
[18] *Thaler v. Commissioner of Patents [2021] FCA 879 (Federal Court of Australia, 30 July 2021)*

rights.

This decision by the court was a big step away from previous ways of understanding the concept of inventorship and at the same time, it opened the doors for the potential of machines to come up with new ideas.

The case here just goes to show that the usual notions of the law of patents have to be thrown in the bin when it comes to AI and when legal system needs to catch up with the pace of technological development.

The whole matter boils down to the very complicated nature of AI in the process of innovation and the ongoing need for precise legislation in defining those who invent.

Reports/Articles:

- ***AI as an Inventor Debate under the Patent Law: A Post-DABUS Comparative Analysis:*** [19]The paper focuses on how AI-generated inventions present various challenges to the traditional patent systems. By concentrating on post-DABUS happenings in Australia, the UK, and the US, the authors point out the deficiencies of the current patent regimes which specify that inventors must be natural persons and they also discuss the possible elements of a more adaptable legal framework that could acknowledge AI contributions and at the same time protect human inventors' rights. Firstly, the work suggests that AI systems which are capable of coming up with inventions independently are the ones to pose severe questions about the conception of the mind, inventorship, and accountability, i.e., the very points that current laws fail to cater to. The comparison of the different legal frameworks shows that the global approaches are not the same: jurisdictions like the UK, US, and EPO are against AI inventorship whereas Australia and South Africa are on the other side allowing partial recognition. This article points out the doctrinal vacuum in Indian patent law, acquaints with different practices from the abroad, and gives a theoretical base to be used for proposing the policy. It reinforces the research focus on the changing definition of inventorship, the issues that AI technology has put forward, and the requirement for the

[19] *Saravanan, A., & Deva Prasad, M., "AI as an Inventor Debate under the Patent Law: A Post-DABUS Comparative Analysis" (2024) 47(1) European Intellectual Property Review 26–39*

legislative or interpretational decree of patent law which would be strong enough to face the era of machine innovation.

- ***The Reasonable Robot: Artificial Intelligence and the Law[20]:*** This delves into the changing interactions between artificial intelligence and legal systems and maintains that the law must not differentiate between a human's and an AI's actions. He brings in the idea of "***AI legal neutrality***," suggesting that the conduct of AI be regarded as that of humans for all the different branches of law such as torts, criminal law, tax, and intellectual property.

  Abbott points out that AI units are becoming more and more capable of making decisions by themselves and even creating new things, and they must be fairly and legally recognized in order for justice, effectiveness, and the continuous promotion of innovation to take place. This, however, is very relevant to patent law as the argument questions the traditional patent doctrines restricting inventorship to human creators only.

  By supporting a neutral and more inclusive legal perspective, Abbott lays down the conceptual groundwork necessary to identify inventions made by AI, thus making a great deal of the jurisdictions like that of India, where the legal framework is still struggling with the impact of AI on innovation. His work contributes to the wider conversation on reconceptualizing inventorship in the era of machine-generated creativity and underscores the need for changes in policy so as to facilitate the role of AI as a game changer in the field of intellectual property.

- ***WIPO Technology Trends 2019: Artificial Intelligence[21]:*** Artificial Intelligence, offers a summary that is inclusive of the whole world with respect to innovation in AI, which is the main feature of the report. This summary serves as an indication of the very quick growth and successful utilization of AI technologies. The report gives an indication of the nature of AI innovation over time. It states that as of the 1950s, 340,000 AI related patent applications have been filed, of which more than half have been filed since 2013. Besides, the report links various possible areas of application to the AI technology improving and learning from data, for example, telecommunications, transport, life

[20] *Abbott, R., The Reasonable Robot: Artificial Intelligence and the Law (Cambridge University Press, 2020)*
[21] *World Intellectual Property Organization, WIPO Technology Trends 2019: Artificial Intelligence (WIPO, 2019)*

sciences, banking, and agriculture. It also mentions that in AI patent filings, China, the US, South Korea, Japan, and India are the top five countries, with India being the fastest growing. Moreover, the report delves into the upgrading trend by looking at the means of it such as the benefits from the market, the program for easy access to the AI source, and the buying of the companies. The economic and technical importance of AI being continuously higher is what all these trends show. The present work is a confirmation of the necessity of changes in patent laws in order to be able to deal with AI driven inventions, not only highlighting the difficulties faced by legal and policy sectors but also showing the very speed of global innovation systems which necessitate the adoption of AI.

Chapter 4 - EMPIRICAL ANALYSIS- CRITICAL STANDPOINTS ON AI INVENTORSHIP

- ***Evaluation of opinions and Evolving Trends: Practitioners, Scholars and Multidisciplinary Participants (Interviews and Questionnaires)***

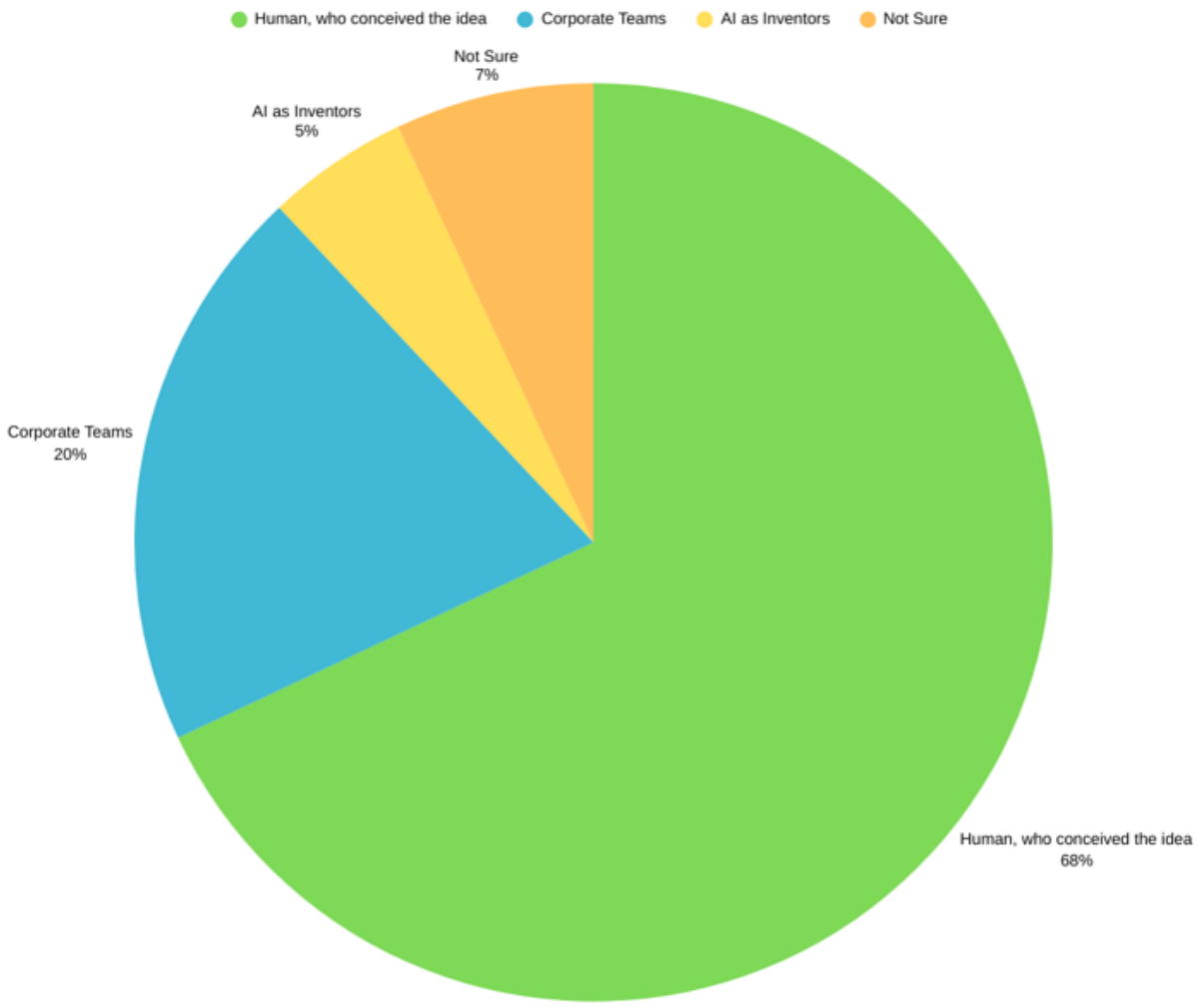
This research involved people with different kinds of jobs to reflect a complete picture of the idea of AI as an inventor. Among the participants, 40% were IP professionals, 25% were AI, driven startups and technology corporations industry experts, 20% were legal academics and researchers, and 15% were policymakers and regulatory officials. The range of representation from different sectors allowed the study to have deeper and wider reflections on the issues that surround inventions generated by AI.

Open-ended comments voiced the synergy of legal, ethical, and business perspectives in the identified areas, and at the same time, unveiled newly found issues in granting AI the status of the inventor. On the one hand, industry professionals were driving the wheel of technology by pointing to the benefits of innovation and international competitiveness. On the other hand, it was the turn of the legal experts and the academics to bring forth the doctrinal and statutory restrictions of the present patent frameworks. Further, they also saw the issue of regulation from a different angle and suggested that there was a need to have unambiguous rules in place that were matching technological progress with legal accountability. Together, these discoveries not only elucidate changing stakeholder perceptions that are key to understanding the complexity of the incorporation of AI in existing patent systems but also highlight the importance of the reforms in law and policy that are being considered.

Issues recognized in the field

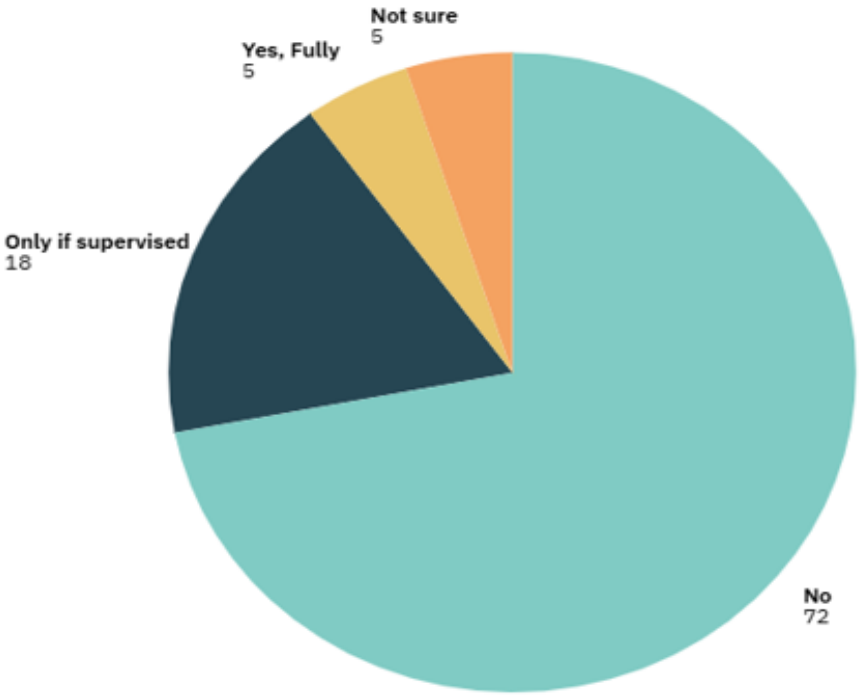
a) Who is considered an inventor under current Indian Legislation?

- 68% said that only a human being who came up with the idea should be the one to qualify.
- 20% thought that the inventors comprising the corporate teams should go as far as being considered as contributors to the invention.
- 5% of them agreed that artificial intelligence systems should be recognized as inventors.
- 7% had no idea.



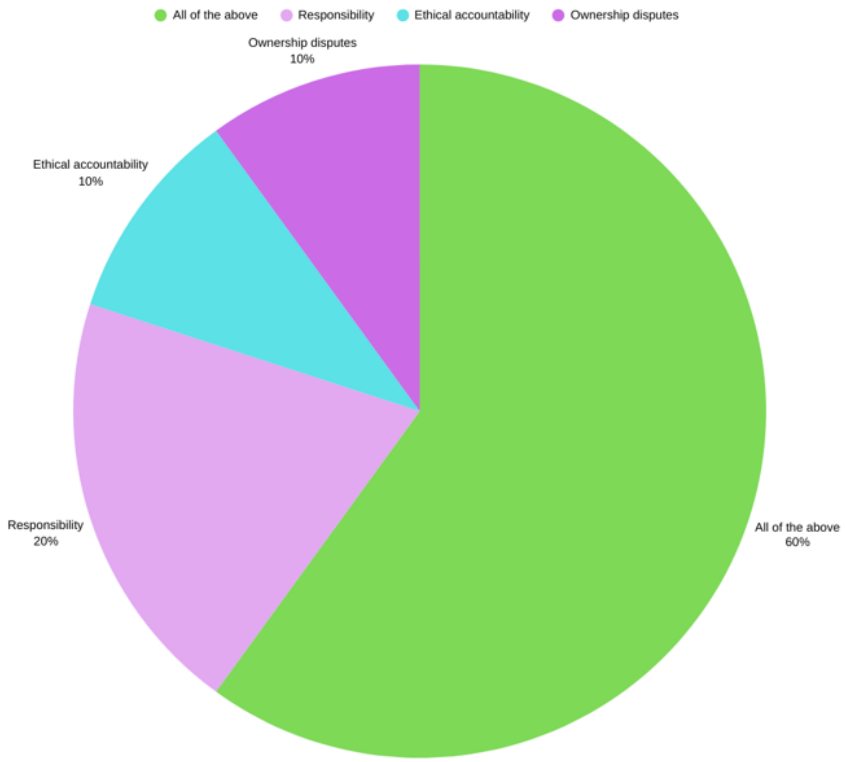
b) Should AI be recognized as an inventor?

- 72% disagreed, stating accountability concerns.
- 18% said it would be okay if a human was in control.
- 5% thought that AI should be given full inventorship
- 5% were uncertain.



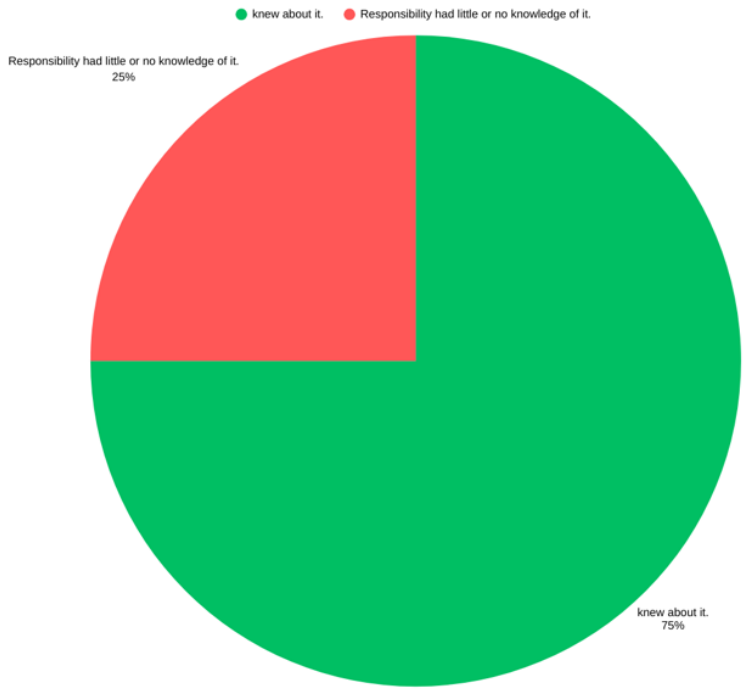
c) What are the major challenges in AI inventorship?

- A majority of 60% respondents indicated "all of the above"—responsibility, ethical accountability, and ownership disputes as major challenges.
- 20% of the participants considered the main issue to be the assigning of responsibility.
- 10% of the participants thought that the main problem was ethical accountability.
- 10% of the participants pointed to Ownership disputes



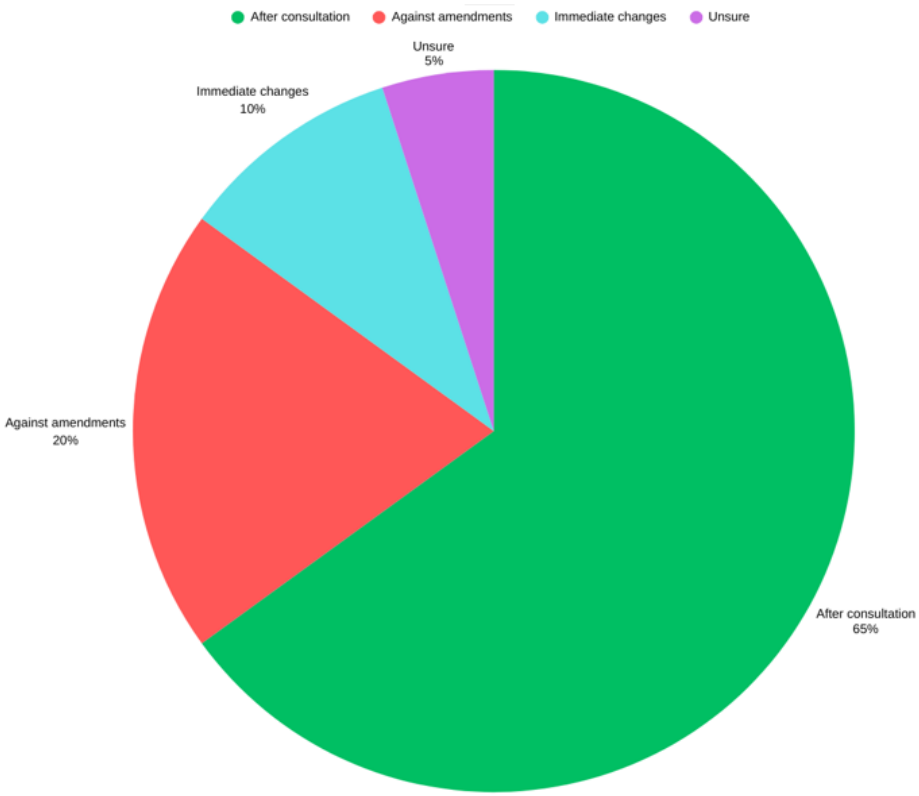
d) Awareness of the DABUS case as an example of global debates:

- 75% knew about it.
- 25% had little or no knowledge of it.



e) Are changes in patent laws necessary to facilitate inventions generated by AI?

- 65% supported changes but only after a detailed consultation process.
- 20% were completely against any amendments.
- 10% were of the opinion that changes should be made immediately to promote innovation.
- 5% were unsure



❖ ***Issues recognized in the field***

An analysis of the narrative included in the interview process has found a wide range of concerns that have been mentioned repeatedly in the opinions of industry professionals, legal experts, and other interested parties about the inventions generated by AI:

Uncertainty over liability for patent infringement: Those surveyed pointed out a great problem that it is not quite clear how specific legal responsibility is to be assigned when AI

systems create inventions by themselves that, at the same time, are considered to be in conflict with already existing patents. At present, patent regulations mainly accept humans as inventors of the AI systems, and the situation regarding which of the developers, operators, or the AI system should be considered as the ones legally responsible for the AI system to be chosen is still unclear. This breach creates various fundamental questions such as: how to carry out enforcement, what types of compensation to offer , or the possibility of lawsuits in cases of AI inventions that have caused accidental infringement.

Challenges in attributing contributions involving proprietary or cross-border datasets: Many participants reported that they are concerned about the disclosure obligations in a situation where AI inventions come from datasets that are proprietary, confidential, or sourced across multiple jurisdictions. In these cases, the requirements for lawfulness in terms of transparency, and inventorship disclosure become even more complicated, as international data-sharing agreements and intellectual property laws might have different views when it comes to obligations.

Risk of monopolistic control by large technology firms: Among the various concerns was the scenario in which the rights to the patented inventions would be controlled by the handful of technology companies, which have the most advanced AI facilities. This situation would lead to the suffocation of competition, limit innovation, possibility of antitrust problems that would most probably happen if these firms become the holders of the patent landscape for AI-generated technologies.

Ethical and regulatory concerns in sensitive sectors: The interviewees also were concerned about the ethical aspect of AI-invented machines in high-stakes fields such as healthcare, finance, and biotech. By asking who would be accountable, and calling for transparency, the respondents were also referring to the possible social effects that AI decisions may have, thus emphasizing the need for a regulatory body that will ensure the quality of AI-generated products, according to the set standards and the public's safety requirement.

Chapter 5 – FINAL ANALYSIS

- ***Overview of Doctrinal and Empirical Findings***

The doctrinal research shows that the currently existing patent frameworks, including India's

Patents Act, 1970, are not able to adapt to the cases where AI systems have independently created an invention. In the notion of the inventorship, the concept of mental conception and creative intent, whih are characteristics of a human mind, are still very important. AI systems, by the way, are categorized as per the current legal definitions, and they are said to be incapable of such attributes. Cases, such as *Thaler vs. Commissioner of Patents and different DABUS*-related proceedings, are outlines of the global consensus on the issue that the inventorship should be kept human-centric ones.

Several empirical studies are frequently cited to substantiate the doctrinal consensus. Most of the stakeholders' opinions (legal professionals, experts from the industry, and policymakers) significantly lean towards a conclusion that AI should not be granted inventorship rights. The issue, which was raised almost in all the instances, was that of liability, accountability, rights conflicts, and enforceability. A statistical note: 72% of surveyed persons were on the side of not recognizing AI as an inventor, and on the other hand, 65% were for legislative changes only after a thorough consultation process involving all the relevant stakeholders having taken place.

Though they recognized the AI instrumental role in the innovative process, AI had never been granted any kind of statutory rights in the hands of the participants. The main worry is responsibility being non-clearly allocated and thus the target being taken over by the most technologically advanced companies and the difficulties that might arise in the enforcement of the law.

- ***Critical Evaluation of Loopholes and Hurdles***

The research points out several major gaps in the patent framework in India relating to AI inventions and brings out how the present structures of law have not been able to adjust to the cutting-edge technological world:

Absence of Clear Guidelines - In India, Patents Act, 1970 is silent when it comes to only AI inventions or those which are done with significant AI help. Due to the lack of statutory direction, there is a lot of uncertainty regarding the identification of the inventorship, disclosure of the obligations, and filing requirements. The doctrinal research, along with the empirical data of stakeholders, suggests that this ambiguity may result in various ways of the patent applications, arising ownership claims, and indirectly in litigation problems.

Fragmented Legal Landscape: Currently, in India, the overlaps between patent, copyright, and information technology laws, as well as data protection regulations, are not very well coordinated. This separation of the different rights causes ambiguities in the areas of ownership rights, availability of training datasets, and the determination of the party that should be held legally responsible for the case when the AI system violates the law and infringes the rights. Also, transfer of data across borders makes compliance even harder, particularly in the case of collaborative innovation with proprietary or sensitive datasets.

Lack of Awareness and Preparedness - It is a fact that a good number of industry professionals, legal practitioners, and policymakers are aware of international debates about AI inventorship, however, there is barely any structured guidance within India. The nonappearance of organized educational programs, advisory frameworks, and policy briefs altogether leaves the stakeholders less competent in navigating the emerging challenges, which potentially creates a delay in the adoption of AI-driven innovation or non-compliance with the changing legal expectations.

Ethical and Policy Concerns - On the off chance that the AI was allowed to freely come up with patents, it would be able to deepen the already existing monopolistic control over by technology dominant companies, reduce the transparency of the patenting process, and make the enforcement, particularly across the border, more difficult.

While talking about the ethical problems connected with the mentioned situation in the healthcare, finance, and biotechnology sectors, one can underline that AI generated solutions in these spheres may lead to significant changes in society. The empirical research participants emphasized the need for comprehensive legislative debate and political safeguards to be put in place to balance the innovation incentives with the responsibility, justice, and the public good.

Altogether, these holes symbolize the urgent need for a reexamination of both law and regulations in India to gain clarity on the role of AI in the inventive process while at the same time there is compliance with doctrinal principles and the practical realities of innovation governance.

- ***Future Directions of Inventorship amid the AI Revolution***

With AI changing the whole process of research, development, and industrial innovation, India

needs to take a careful step that is in line with both the principles of the Constitution and the global best practices. A patent system that is ready for the future must be constituted of the following five major elements:

- ***Human-Centric Inventorship with AI Disclosure Norms***: Patent laws have to clearly mention that inventorship is only for humans and detailed disclosure of AI's role in idea generation or development must be required.

- ***Organization of Governance Frameworks:*** The mechanisms of oversight must have the tools to ascertain accountability in data usage, design of the algorithm, and in the intellectual contribution, maybe through the roles of supervision or joint inventorship,

- ***Legislative and Regulatory Consultation:*** People who make the policy should talk with people who are experts in law, technology, ethics, and industry to come up with the regulations that can foresee the future conflicts and unify the regulatory frameworks.

- ***Awareness and Capacity Building****:* Educational activities for patent examiners, industry participants and legal professionals are mandatory to make knowledgeable decisions possible.

The move to AI based creation is a classic example of a double edged sword because it allows the creators unimaginable technical possibilities but also difficult legal issues. Not only can India build a technology friendly patent system but by making the needed preparations, such as fixing the loopholes and building the frameworks around accountability, transparency, and innovation, the country can also ensure that the regime maintains ethical and legal standard.

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