INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

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Exploring the Patentability of AI Inventions: Legal and Ethical Challenges

DHARSHINI P.[1] AND MADHUMITHA GOMATHY M.[2]

ABSTRACT

As technology progresses, we are witnessing a growing prevalence of inventions produced through Artificial Intelligence (AI). These inventions, which are created by computer systems autonomously or with minimal human intervention, are becoming increasingly common. In this context, the role of human creativity in such inventions becomes less apparent, while the process of invention itself becomes more accessible, as the AI takes on a substantial portion of the cognitive workload. Uncertainty might arise in circumstances in which AI provides the creative input and no human creativity is required. The main issue here is that the patent law continues to be based on the presumption that only human beings are capable of inventing. Therefore, "inventions without an inventor" will be rejected by courts and patent offices. If we don't fill with an update in this void, a system meltdown is unavoidable. A patent modernization is absolutely necessary in the age of Artificial Inventions. This paper deals with Artificial Intelligence inventions and their Patentability. The Challenges faced by the Corporations using AI to create new inventions. The disparity between the existing legal framework and the current demands are discussed in depth. In light of this, recommendations are suggested for updating the existing law in order to maintain the effectiveness of the patent system.

Keywords*: Artificial Intelligence, Patents, Inventorship, AI Inventions, Patentability, Legal Framework.*

I. INTRODUCTION

A fundamental revolution is underway as a result of the growing integration of Artificial Intelligence (AI) into the arena of invention, threatening the conventional foundations of patent law. The rise of AI-generated inventions created autonomously or with minimum human interaction, has heralded a new era in which the traditional notion of human creativity in the innovative process is becoming less visible. As AI plays a larger part in the cognitive labour of creativity, a critical crossroads occurs, revealing the shortcomings of current patent rules, which are based on the assumption that only humans have the ability to invent.

This study addresses the growing uncertainty surrounding the patentability of AI-generated ideas, revealing the imminent collision between the existing legal framework and the transformative demands of the technological landscape. The crux of the issue is the rejection of "inventions without an inventor" by courts and patent offices, a stance that runs counter to the rapid rise of AI-driven creativity. Without prompt intervention, the divergence between patent law and technological reality threatens to destabilise the system.

Examining the difficulties faced by companies using AI for creating new things, this article carefully looks at the mismatch between the current legal system and the needs of the AI era. It suggests a plan to update patent rules, aiming to close the growing divide and providing suggestions to strengthen how patents work in a time when AI is a big part of inventions. In the mix of new ideas and the old ways of doing things legally, this study strongly advocates for the essential update of patent laws to make sure they stay important and strong in the era of Artificial Intelligence.

II. WHAT ARE AI INVENTIONS?

The phrase "Artificial Intelligence" was coined by John McCarthy in 1956[3]. As of present, no legal definition of Artificial Intelligence exists. Artificial intelligence is a term that can be used to describe the ability of machines to do things that people would say requires intelligence"[4]

Artificial intelligence (AI) is the creation of computer systems capable of doing tasks that need human intelligence. These systems are designed to simulate human cognitive processes, such as learning, reasoning, problem-solving, perception, and language understanding. Unlike traditional computer programs that follow predefined instructions, AI systems have the ability to adapt and improve their performance over time based on the data they process.

AI comes in two primary flavours: general or strong AI and narrow or weak AI. Narrow AI is designed to perform a specific task, such as speech recognition or image classification, while general AI aims to possess the broader cognitive abilities of a human being. Most AI applications nowadays are classified as narrow AI. Machine learning is a crucial component of AI, allowing systems to learn from data patterns and make predictions or decisions without explicit programming. Deep learning, a subset of machine learning, involves neural networks that mimic the human brain's structure, enabling AI systems to process vast amounts of unstructured data. AI is prevalent in various domains, including healthcare, finance,

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[3] Fredy Sánchez Merino, *Artificial Intelligence and a New Cornerstone for Authorship*, WIPO-WTO Colloquium Papers, p. 28. 2018
[4] Philip C. Jackson, *Introduction to Artificial Intelligence* 1 (Dover Publications, Inc., 1985)

transportation, and entertainment, revolutionizing industries and enhancing efficiency. However, ethical considerations, transparency, and the potential impact on employment and society are important aspects to navigate as AI technologies continue to advance.

III. LEGAL FRAMEWORK IN INDIA

In India, there is currently no specific legislation addressing the application of Artificial Intelligence (AI). The Ministry of Electronics and Information Technology (MeiTY)[5] serves as the regulatory authority for AI in the country, responsible for formulating, implementing, and overseeing AI laws and guidelines. While there is no dedicated AI law, certain provisions within the Intellectual Property Law, as well as sections 43A and 72A of the Information Technology Act, 2000[6], are relevant. These provisions stipulate that individuals engaging in criminal activities using AI can be held accountable under the Information Technology Act, criminal law, and other cyber laws.

Furthermore, the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules of 2021[7] impose obligations on social media platforms to exercise heightened diligence in managing content on their platforms. This regulatory framework aims to address the legal implications of AI use, albeit without a specific AI law, by integrating relevant provisions within existing legal frameworks governing intellectual property, information technology, and cybercrime in India.

In 2018, the Indian planning commission introduced the National Strategy on Artificial Intelligence (NSAI)[8], outlining the establishment of a panel comprising the Ministry of Corporate Affairs and the Department of Industrial Policy and Promotion to oversee regulation. The focus was on creating Intellectual Property (IP) regimes for AI advancements and implementing legal frameworks for data protection, security, and privacy. The Ministry of Electronics and Information Technology (MeiTY) formed four committees to delve into various ethical aspects of AI.

The Personal Data Protection Bill 2019[9], proposed by MeiTY in 2019 and based on a draft statute on data protection, aimed to safeguard individual rights concerning personally collected, transferred, and processed data. Although the bill was pending in the lower house, the Central

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[5] Ministry of Electronics and Information Technology (MeiTY), https://www.meity.gov.in/ (Nov14,2023, 6.40 PM)

[6] Information Technology Act 2000, Section 43A and 72A , Acts of Parliament, 2000 (India)

[7] Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules of 2021, Acts of Parliament 2021(India)

[8] National Strategy on Artificial Intelligence (NSAI) , available at https://www.niti.gov.in/sites/default/files/2023-03/National-Strategy-for-Artificial-Intelligence.pdf (last visited on 14-11-2023)

[9] The Personal Data Protection Bill 2019, Acts of Parliament, 2019 (India)

Government withdrew it on August 3, 2022. Similarly, the government also withdrew the Personal Data Protection Bill 2021 in August 2022. On November 18, 2022, MeiTY introduced a new law, The Digital Personal Data Protection Bill 2022, replacing the 2011 rules and existing laws, with a focus on processing an individual's personal data.

Niti Aayog contributed to the establishment of AIRAWAT[10] – the AI Research, Analytics, and Knowledge Assimilation platform, aiming to address the requirements for improved AI utilization. In 2020, Niti Aayog drafted documents proposing the creation of an oversight body and the enforcement of responsible AI principles, including safety and rehabilitation, equality, inclusivity, non-discrimination, privacy and security, accountability, openness, and the defence and upholding of human values. These principles were intended for inspecting practices, forming legal and technical frameworks, developing new AI techniques and tools, and representing India at global standards[11].

According to Section 3(c)(ii) of the Digital Personal Data Protection Act, 2023[12], the act does not extend to personal data that a user has voluntarily made publicly accessible, sparking concerns regarding the potential exploitation of such data for scraping and the development of artificial intelligence (AI). For instance, if an individual, like a blogger, has shared personal data on social media while engaging in blogging activities, the processing of this data falls outside the scope of the data protection law. This clause significantly impacts how AI companies can obtain and utilize people's publicly available data in India for AI development purposes. As Sarvesh Mathi outlines in his article, "Presently, AI companies are not obligated to seek user consent for scraping the personal data of Indian citizens due to the absence of a data protection law, and this situation may persist due to the exemption for publicly available personal data." Consequently, AI services such as OpenAI's ChatGPT and Google Bard could potentially scrape publicly available personal data from the internet to train their models without obtaining consent or adhering to other provisions outlined in the Bill.

IV. INDIA'S POSITION WITH REGARD TO AI

In November 2022, India achieved a significant milestone by assuming the G20 chair and securing the role of the Global Partnership on Artificial Intelligence's (GPAI) chair in waiting. At this juncture, it is essential to comprehend how the world's largest democracy envisions the

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[10] AIRAWAT , available at https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1926942 (Nov 14, 2023, 7.08 PM)

[11] Inbatv *Laws Related To Artificial Intelligence In India*, INBA VIEWOINT (Nov 14,2023, 7.51 PM) https://inbaviewpoint.org/laws-related-to-artificial-intelligence-in-india/

[12] Digital Personal Data Protection Act, 2023, Acts of Parliament, 2023 (India).

role of frontier technologies like AI in its pursuit of becoming a global economic powerhouse. India has presented a technological paradox over the years. Despite early advancements in digital computers and the establishment of highly sophisticated and cost-effective space programs, the nation experienced a delay in its digital transformation and accessibility until a few decades ago. Presently, the Indian government is actively promoting the integration of digital technologies into its inclusive development strategy, primarily through initiatives aimed at ensuring widespread internet access and implementing one of the world's most economical data pricing schemes.

India embarked on its journey into the realm of artificial intelligence (AI) with a central focus on social empowerment and inclusion. Leveraging the scalability of AI, the country aims to address longstanding issues that have persisted for decades. While global powerhouses like the United States and China engage in an "arms race" to establish themselves as the ultimate AI superpowers, India has deliberately directed its efforts toward inclusivity and empowerment through a program known as "AI for All"

In recent years, both the public and private sectors in India have introduced AI-powered tools that significantly enhance the delivery of essential services, positively impacting millions of lives. Notable examples include:

1. MyGov Corona Helpdesk (from MeitY): During the peak of the COVID-19 pandemic, the MyGov citizen engagement platform, in collaboration with the Ministry of Health and AI startup Haptik, launched the MyGov Corona Helpdesk chatbot. This initiative aimed to counteract misinformation by raising awareness about COVID-19 and preparing India to combat the virus.

2. 'e-Paarvai' by the Tamil Nadu State Government: Developed to address the shortage of ophthalmologists, e-Paarvai is an intelligent AI-powered mobile application designed to detect cataracts.

3. 'Uzhavan' by the Tamil Nadu State Government: This app assists farmers in diagnosing pest infections in their crops and provides remedial measures. Using a low-cost mobile camera, farmers can capture images of pest-infected crops and upload them to the Uzhavan app. The integrated intelligent system then analyzes the images, identifies the pest, and sends remedial measures to the farmer's phone in the local language, Tamil.

4. Realtime Digital Authentication of Identity system by Telangana State Government: Implemented during the COVID pandemic, this system authenticates pensioners through a photo upload app. It employs AI-based liveness checks, big data, machine learning-based

demographic checks, and deep learning-based image comparisons to quickly verify user details against public data.

5. Crowd Estimation and Management tool by Telangana State Government: Successfully used by the Telangana police during events such as the India vs West Indies T20 match in 2019 and the Medaram Jatara Festival in 2020, this tool aids in effectively managing crowds[13].

V. PATENTABILITY OF AI INVENTIONS IN INDIA

Patents refer to legal privileges awarded to innovators, providing them with the authority to prevent others from creating, utilizing, selling, or importing a particular invention for a specified duration. In the context of India, the evaluation of AI-related inventions follows the criteria outlined in Section 3(k) of the Indian Patents Act, 1970. This section specifies exclusions regarding patentability, encompassing "mathematical methods, business methods, computer programs per se, and algorithms." In India, AI-based inventions can be granted patents if they meet the criteria of being novel, non-obvious, and useful.

In contrast to patent office like the European Patent Office (EPO), the Japanese Patent Office (JPO), and the United States Patent & Trademark Office (USPTO), the Indian Patent Office (IPO) has not released specific rules for reviewing inventions relating to artificial intelligence. The Computer-Related Inventions Guidelines 2017 (CRI guidelines) are followed for evaluating these inventions. In other words, the subject matter exclusions listed in Section 3(k) of the Indian Patents Act, 1970 are used to evaluate inventions pertaining to artificial intelligence. "Mathematical methods, business methods, computer programmes per se, and algorithms" are prohibited from becoming patentable under Section 3(k). Clarity regarding what should and shouldn't be permitted in relation to mathematical techniques, business procedures, computer programmes in general or algorithms has been made possible by the CRI rules.

The issue of determining who will be recognised as the original and true inventor of any technique or product created by AI is one that patent filers in the AI field frequently encounter. Which one wrote the AI machine's original code—AI or a human? The majority of nations, including India, are currently facing a legal conundrum on this topic. For instance, the EPO has made it clear that a person needs to be a "natural person" in order to be considered an inventor; as a result, an AI system cannot hold this designation. The USPTO took the same stance when the Supreme Court emphasized that a 'person' is defined as a 'human' rather than a machine. On the other hand, the Australian patent system first made a good verdict for treating AI machines

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[13] Jibu Elias, *AI for All: How India is carving its own path in the global AI race,* OECD. AI POLICY OBSERVATORY (Nov 15, 2023, 8.15 PM)**,** https://oecd.ai/en/wonk/india

as inventors, which was later overturned by their Federal Court. Surprisingly, the South African patent office has granted DABUS as an inventor, which is a case in favour of AI robots being considered as inventors. As a result, it appears that the majority of patent offices are opposed to AI computers being considered as inventors. As more AI patent applications are filed, the question of inventorship will become clearer in the coming years.

VI. LEVEL OF CONTRIBUTION BY AI AND HUMAN

When patent laws were initially formulated, the idea of a machine serving as an inventor was nonexistent. Consequently, patent laws across the globe granted invention rights exclusively to humans (for instance, Japanese law explicitly states that only a natural person can be considered an inventor) and not to machines. This paradigm held true until recently. However, the landscape has evolved with machines now significantly contributing, and sometimes entirely driving, the inventive process. In such instances, the question of inventorship becomes pertinent, particularly when the invention is co-shared with a machine. Granting these rights to machines, bestowing them with inventor status, may be deemed meaningless, given that machines are not morally or legally obligated to uphold such rights. Consequently, the examination of co-sharing inventions with machines is likely.

Considering machines as inventors faces challenges. Many AI-driven inventions, particularly those guided by Deep Neural Networks (DNN), operate heuristically. In such cases, emphasis can be placed on the end-result obtained from the process rather than the process itself. If the end-result aligns with criteria defining a human or natural person as an inventor, then the machine or AI system could potentially be recognized with the same status. However, current laws do not exist to support machines as inventors, making this scenario unlikely in the immediate future.

An alternative approach revolves around considering a corporate entity or assignee as the inventor. According to U.S. patent law, inventorship lacks a specific statutory definition. In the absence of a formal definition, the court in Fiers v. Revel clarified that the crucial question in determining inventorship is identifying the entity that conceived the invention. While a 'Legal Person' can be a non-human entity treated as a person for specific legal purposes, such entities, like corporations, can assume the role of the legal person in place of the machine or AI system, allowing for the assignment of rights[14].

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[14] TATA Consultancy Services, *Understanding the Dynamics Intellectual Property*, CIIIPR CIIP (Nov 15, 2023 8.23 PM) https://www.ciiipr.in/pdf/CII-TCS-Report-on-Understanding-the-Dynamics-of-AI-in-IP.pdf

VII. MAJOR GAPS IN THE INDIAN LEGAL SYSTEM

As of the year 2023, there exist several significant deficiencies in the process of patenting AI inventions in India. To ensure the effective protection of AI inventions, it is crucial to bridge these gaps. The key issues include:

1. Undefined AI Terminology: The absence of a precise and comprehensive definition of artificial intelligence (AI) within Indian patent law introduces uncertainty and inconsistency in determining the patentability of AI inventions. This ambiguity has resulted in numerous patent disputes, including cases where AI inventions were rejected for failing to meet patentability requirements. A well-defined AI definition would establish a framework for evaluating and safeguarding AI inventions in India.

2. Inadequate Eligibility Criteria: The current criteria for patentability in India, requiring inventions to be novel, inventive, and industrially applicable, are not well-suited for AI inventions. AI innovations often involve intricate algorithms and complex mathematical models, posing challenges in demonstrating their novelty and inventive steps. Additionally, the industrial application requirement may not always be relevant to AI inventions, which may primarily serve scientific or research purposes.

3. Exclusion of Specific Subject Matters: Certain types of inventions, such as computer programs per se and algorithms, are excluded from patent protection in India. While this exclusion aims to prevent the patenting of abstract ideas and mathematical methods, it can hinder the protection of AI inventions integrated into computer programs or relying on novel algorithms.

4. Limited Protection Scope: The protection granted to AI inventions in India may not sufficiently cover the underlying technology. For example, the protection awarded to a patented AI invention might not extend to subsequent advancements or improvements in the technology, restricting the inventor's ability to benefit from their innovation.

5. Enforcement Hurdles: Even when AI inventions receive patent protection, enforcing these patents can be challenging due to the intricate nature of AI technology and the difficulty of proving infringement. AI systems often consist of numerous interconnected components, making it complex to determine whether a specific product or process infringes on a patented AI invention. Additionally, the rapid pace of technological progress can swiftly render AI patents outdated, complicating efforts to maintain their enforceability.

VIII. COMPARING DIFFERENT NATIONS ON THE TAKE OF INVENTIVE STEP REQUIREMENT

(A) US

Artificial intelligence (AI) is a fast expanding field with the potential to revolutionise a wide range of industries. The realm of patent law is one area where AI is having a substantial impact. Despite not being able to be identified as inventors, AI inventions are patentable under US law. This is a crucial distinction since it permits people and businesses to patent their AI ideas. The Alice test is used to determine if patent claims for AI inventions are eligible. This approach assures that only patent-eligible conceptions are granted patents, reducing the possibility of patenting abstract ideas or natural phenomena. Patent drafters should focus on avoiding patent eligibility rejections by ensuring that claims fit inside a statutory category of patentable subject matter and attempting to meet the Alice eligibility test's two parts. AI inventions are more likely to be patentable if claims are focused to how AI is architecturally integrated into a system, the data sources utilised as input for an AI system, how AI is distinguished from other systems, or specific actions inside an AI system. Claims describing the development and testing of AI or the execution of an AI algorithm on data, on the other hand, are more difficult to qualify as patentable subject matter[15].

(B) Europe

A European patent application must identify the inventor under the European Patent Convention (EPC). According to Rule 19(1) EPC, the application must include the inventor's family name, given names, and full address, as well as the applicant's or his representative's signature. AI may be listed as the inventor in some jurisdictions. Recently, the South African patent office and an Australian court approved patents naming artificial intelligence as the inventor. However, the European Patent Office (EPO) denied Dr. Thaler's two European patent applications in 2018 because they did not name a natural person as the inventor. The EPO claimed that the inventor must have legal personality since various rights are associated to the title of inventor and a machine or AI system would be unable to exercise such rights because it lacks legal personality. The UK IPO also denied two of Dr. Thaler's applications, both of which named the AI machine DABUS as the inventor, for failing to specify a natural person as the inventor. Marcus Smith J. upheld this decision on appeal. Smith J, on the other hand, noted that

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[15] Crowell, *Artificial Intelligence Inventions are patentable under U.S. Patent law, Even If Artificial Intelligence Can't Be an Inventor*, CROWELL (Nov 15,2023, 5.15 PM) https://www.crowell.com/en/insights/client-alerts/artificial-intelligence-inventions-are-patentable-under-us-patent-law-even-if-artificial-intelligence-cant-be-an-inventor

his decision should not be understood as indicating that DABUS would not be 'capable of a creative notion' on its own. As a matter of fact, he stated he is proceeding on the basis that DABUS has 'invented' the inventions the subject of the Applications[16].

(C) China

In recent years, China has been actively patenting AI inventions, with strong government support and strategies to becoming a world leader in AI. The State Council of China issued a strategy in 2017 with the goal of developing new technologies and standards by 2020, major breakthroughs and economic transformation by 2025, and industry growth to around USD 150 billion by 2030. As a result, there has been an upsurge in AI-related patent applications in China, with Chinese universities and public research organisations cementing their leadership in the sector. They account for one-fifth of the top 500 patent applicants and 17 of the top 20 academic participants in artificial intelligence patenting. The State Grid Corporation of China is also among the top 20 firms with high AI patent application rates, with an average yearly rise of 70% from 2013 to 2016. The company's filings have concentrated on machine learning approaches related to life sciences. However, there are also issues and concerns in China regarding AI patentability, inventorship, and enforcement. The criteria for patent examination for AI inventions are still evolving, and there are disagreements about whether AI systems can be recognised as inventors. AI patent enforcement can also be difficult because AI technology is often sophisticated and difficult to grasp[17].

(D) Japan

Japan has been at the forefront of developing and implementing AI-generated invention patenting policies. The Japan Patent Office (JPO) announced new rules for the examination of AI-related innovations in 2019, providing a framework for determining patentability. The recommendations stress the necessity of human engagement in the inventive process and demand that the AI system's contribution be explicitly defined and stated in the patent application. The subjective character of the inventive step/non-obviousness test is one of the major obstacles in patenting AI-generated ideas. To solve this issue, the JPO has formed a panel of specialists to advise on the evaluation of AI-related inventions. The team, which comprises specialists in artificial intelligence, patent law, and other related subjects, is entrusted with defining best practises for examining such ideas. Overall, Japan's approach to patenting AI-generated innovations demonstrates a willingness to strike a balance between the need to

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[16] Dr. Maurice Schellekens, *Artificial Intelligence and the re-imagination of inventive step*, JIPITEC 14(3) 2023.
[17] ROUSE, *Patenting Artificial Intelligence in China and South-East Asia*, ROUSE (Nov 15,2023, 5.40 PM) https://rouse.com/media/y3xpcx3o/rouse-patenting-artificial-intelligence-in-china-and-south.pdf

stimulate innovation and the need to ensure that patents are awarded only for truly unique and non-obvious discoveries. Japan is paving the way for a more harmonised and effective worldwide patent system in the age of AI by offering clear standards and expert guidance on the assessment of AI-related inventions[18].

IX. SUGGESTIONS AND RECOMMENDATIONS

To address these gaps, it is recommended that the Indian government and patent authorities take the following actions:

1. Establish a Clear AI Definition: Develop a precise and comprehensive definition of AI, considering its technical capabilities, applications, and limitations.

2. Revise Eligibility Criteria: Tailor the criteria for patenting AI inventions to accommodate their distinctive features, including non-obviousness, complexity, and potential industrial applications.

3. Clarify Patent Protection Scope: Ensure that the scope of protection for AI inventions is broad enough to encompass the underlying technology and its potential applications while preventing the patenting of abstract ideas and mathematical methods.

4. Enhance Enforcement Mechanisms: Improve enforcement by offering specialized training to patent examiners and judges, establishing clear guidelines for assessing AI patent infringement, and streamlining the dispute resolution process.

5. Promote Public Understanding: Conduct educational campaigns, workshops, and seminars to inform the public about the challenges and opportunities associated with patenting AI inventions.

By addressing these issues, India can establish a more resilient and effective patent system that encourages innovation and safeguards the intellectual property rights of AI inventors.

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[18] Ana RAMALHO, *Patentability of AI-Generated Inventions –Is a Reform of the Patent System Needed?*, IIP.OR.JP (Nov 15,2023, 4.16 PM) https://www.iip.or.jp/e/summary/pdf/detail2017/e29_02_Ramalho.pdf

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