

Artificial Intelligence (AI) and its Impact on IP Laws of India & US

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ABSTRACT: The concept of Artificial Intelligence (AI) is a complex issue and affects almost every sphere of modern world. The basic idea behind artificial intelligence was the concept of creating machines which can think and act like humans. The concept of AI has gained such momentum in the recent years that it has become a topic of discussion not only for the students but also for, academicians, lawyers and policy-makers.

With the topic being of so much relevance, it is bound to affect several laws once it is actually implemented. In light of the above development, the research in the research paper attempts to discuss:

- a) Overview of the AI technology
 - b) Historical evolution and definition of AI
 - c) The manner in which global AI revolution is taking place
 - d) The patent eligibility jurisprudence involving AI technology and a comparative study concerning the patent eligibility of AI under United States Patent law and the Indian IP laws.
 - e) The substantive requirements in light of judicial decisions on AI technology to be patent-eligible.
 - f) The future ahead of AI by examining the potential for legal systems to adapt to technological change.
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I. INTRODUCTION

The concept of Artificial Intelligence (AI) is a complex issue. Even though the concept is not of recent origin, but has gained such tremendous momentum in the recent times that it has become a subject of discussion not only for scientists, but also for academicians, policy-makers and industrialists. This is largely because the arena of Artificial Intelligence is so wide that it affects almost every sphere of modern world.

The basic germ of creating “thinking machines” took the shape of Artificial Intelligence. Thus, Artificial Intelligence is the science of creating machines to solve problems and do such work that is too complicated for the human brain to do by itself. It works on the principle of “One Input-Multiple Output” whereby the starting or initial input is given by human intervention and the resulting output is created by the machine by applying its own artificial intelligence. Some of the known examples of artificial intelligence are: planes that fly without pilots, robots that help perform operations.

The researcher in the research paper deals with the following:

- g) Overview of the AI technology
- h) Historical evolution and definition of AI
- i) The manner in which global AI revolution is taking place
- j) The patent eligibility jurisprudence involving AI technology and a comparative study concerning the patent eligibility of AI under United States Patent law and the Indian IP laws.
- k) The substantive requirements in light of judicial decisions on AI technology to be patent-eligible.
- l) The future ahead of AI by examining the potential for legal systems to adapt to technological change.

II. EVOLUTION OF AI

The concept or notion of “Artificial Intelligence” implies an idea of “Intelligence” apart from human beings. Long before the emergence of “Artificial Intelligence” and “Computers” and even before the people had knowledge of electronics, humans were irritable drawn to the idea of ‘Intelligence’ outside the human body. The seeds of artificial intelligence can be traced to the Greek mythology in the West.

In Book XVIII of *The Iliad*, there are two separate passages in which Hephaestus, the great craftsman is described as the creator of robot-like machines. The first passage deals with the automatic waiters:

“Three legged tables he was constructing, twenty in all, to stand round the wall of his well-built hall. To these he had fitted wheels wrought of gold, so that they could run by themselves the banquet of the Gods, at his wish, and back home, leaving every one staggered.”

While the second introduces a clever girl-assistants of Hephaestus made of gold:

“Handmaidens, fashioned of gold, gave ready support to their master.

Looking like genuine girls they proved their understanding

By their intelligent speech, their proficient and skillful performance.”¹

However, the most astonishing revelation from the Greek scene comes from the *Antikythera mechanism*, which represents ancient clock-computers. The modern computer simulation is somewhat an extension of the Greek *Antikythera mechanism*². These mechanisms were, however, ‘dedicated’ to a particular set of computations, following a single conceptual model. What is, however, new about the modern computers, is their ability to represent very different conceptual models and perform very different functions, according to program

¹ Kevin Osborn & D.L Burgess, *The Complete Idiot’s Guide to Classical Mythology* 90 (Penguin, 2005) (1998)

² S. Rajmohan, *Philosophical perspectives in Artificial Intelligence*, 1, 7-10 (1995)

instructions.³

In the medieval Europe, Pope Sylvester-II is said to have built a talking head with a limited vocabulary while the Arab astrologers are attributed with a “thinking machine” called *Zaitja*. In the early 16th century, Paracelsus, a famous physician, invented *Homunculus*, a little man. “We shall be like Gods,” he wrote “We shall duplicate God’s greatest miracle-the creation of man.”⁴

In the 16th century, rabbi Juddah ben Loew sculpted a living clay man Joseph Golem, but soon dismantled it as it became overly aggressive.

Also in the Hindu religion, plants are regarded as intelligent and living. The phenomenon of circulation of sap was discovered by Harvey in the West only in the 17th century. But the detailed discussion on this can be found in the *Vaisesika-Sutras* of Karnataka. The *Mahabharata* gives a concise discussion on the life and intelligence in plants.⁵ The experiments conducted by Dr. J.C Bose on these lines in the early-20th century are very well-known.⁶

Outside the Hindu tradition the Chinese had similar achievements. The most noteworthy among them was the remarkable astronomical clock made by Su Sun in 1088 A.D⁷

Thus, from the above it is clear that the concept of Artificial Intelligence in the sense of having intelligence outside human beings is not new.

III. WHAT IS ARTIFICIAL INTELLIGENCE?

The historical development conceptualizes Artificial Intelligence. But it does not define what Artificial Intelligence is?

English mathematician Alan Turing introduced AI as a concept in a 1950 paper, and American computer scientist John McCarthy coined the term “artificial intelligence” during the Dartmouth Conference in 1956. No single definition of AI is accepted by all practitioners.

Artificial Intelligence is, roughly put, “the branch of computer science concerned with making machines behave intelligently.”⁸ Some define it broadly as a computerized system exhibiting behavior commonly thought of as requiring intelligence, whereas others define AI as a system capable of rationally solving complex problems or taking appropriate action to achieve its goal in real-world circumstances.⁹

³ Richard L. Gregory, *Mind in Science* 68 (George Widnefield and Nicolson, 1981) (1981)

⁴ Pamela McCorduck, *Machines Who Think* 12 (Freeman, 1979)

⁵ P. Ray & S.N Sen, *The Cultural Heritage of India* 184 (The Ramakrishna Mission Institute of Culture, 1986)

⁶ Peter Tompkins & Christopher Barl, *The Secret Life of Plants* 81-86 (Penguin, 1974)

⁷ Richard L. Gregory, *Mind in Science* 67 (George Widnefield and Nicolson, 1981) (1981)

⁸ 2 John McCarthy, “Artificial Intelligence” in *Collier’s Encyclopedia* 714 (P.T Collier Inc., 1980)

American cognitive scientist Marvin Minsky defines Artificial Intelligence as “the science of making machines do things that would require intelligence if done by men.”¹⁰

Thus, various scientists have defined artificial intelligence in their own way as per their own understanding. However, before defining or attempting to define the term ‘artificial intelligence’ the basic question ‘Why should we make computers think?’ should be answered. The question can be paraphrased as ‘To what extent we make computers intelligent?’ The answers to these questions help us to identify the major trends or the method of approach that should be adopted to define AI.

By making ‘intelligent’ machines, the following ends can be served:

- a) By creating machines that can function intelligently, human beings are benefitted. Such machines can assist humans in complex tasks as they have the intellectual capacity at par with that of humans.
- b) By creating such machines, unknown areas of the world can be discovered and various philosophical problems can be solved.

IV. Artificial Intelligence (AI) under IP Laws of USA and India

AI has gathered attention from the major tech players of the world such as Google, Facebook, IBM, etc. In October 2015, Google’s AlphaGo became the first computer program to beat the European champion Fan Hui in Go, a game known for its extreme complexity, with about 250 choices per move¹¹ and subsequently in March 2016, AlphaGo beat Sedol Lee, Go’s 18-time world champion.

The above development of AI has triggered a pointer towards the IP protection of AI-generated materials. Usually, IP protection is granted for ‘*original*’ creations. But with AI-generated materials, can the IP protection be extended for them?

Traditionally, both copyright and patent laws have relied on the concept of author or inventor as a natural person. But the creativity and knowledge exhibited by AI systems in the past has raised concerns regarding IP protection of such knowledge.

Also, the public have accepted AI and are friendlier which can indirectly impact legal and policy considerations. The perception of USA towards AI has been more restrictive, however, outside USA, certain trends and events indicate the extent of public acceptance of AI, which may influence the US approach to AI.

In Europe, for example, a survey conducted by the European Parliament showed that 68% expressed positive views on AI, while 79% had positive outlooks on robotics. In Japan, Deep Knowledge, a venture capital firm,

⁹ Exec. Office of the President Nat’l Sci. & Tech. Council Comm. On Tech. Preparing for the Future of AI (2016) 6

¹⁰ M.L Minsky, *Semantic Information Processing* 5 (MIT Press, 1968)

¹¹ L.V Allis, *Searching for Solutions in Games and Artificial Intelligence* 7 (1994)

named Vital, an AI-based robot to its board of directors, in 2014.¹² Saudi Arabia even went further and declared Sophia, an AI-powered robot, a citizen in October 2017, making “her” the world’s first AI citizen.¹³

- **IP protection for AI in USA**

The main issue which hounds not only the US IP Law but also every country’s IP protection regime is patentability of inventions created by AI. But before discussing that, the researcher would briefly discuss the patent subject-matter eligibility for AI software.

Patent and patent applications contain “claims” which provide a brief on what the invention is elaborating the principles on which the invention works. Such claims constitute a vital component of the patent because they delineate the boundaries of legal protection provided by that patent.¹⁴

Most of the patent law jurisprudence of USA is extensively based on Sec. 101 of the United States Patent Act and on a body of judicial decisions applying this statutory provision.

Inventions in the area of AI include methods for making computers implement mental steps¹⁵ and devices that are designed to automatically carry out mental steps. However, Section 101 does not state whether methods and devices implementing mental steps are eligible for patent protection. It merely limits the subject-matter of patent to “new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”.¹⁶

Even though the US Patent law is silent on this point, the U.S Supreme Court, by adopting a broader scope has held in *Mayo Collaborative Servs. v. Prometheus Lab Inc.*¹⁷ that patent claims which are directed to abstract ideas (e.g. a mathematical algorithm), natural phenomena or laws of nature are not eligible for patent protection, further explaining that “they are the basic tools of scientific and technological work”, and that granting monopolies on those tools through patent rights might impede innovation.

Further, in *Alice Corporation Pty. Ltd. v. CLS Bank International*¹⁸ the Supreme Court made it more challenging for applicants to obtain patents on software or “computer-implemented inventions”. This decision has been interpreted and applied by the Federal Circuit and various lower federal district courts to exclude patent claims directed to subject-matter that could be performed through an “ordinary mental process” or by “a

¹² Ellie Zolfaghaifard, “Would you take orders from a ROBOT? An artificial intelligence becomes the world’s first company director”, DAILY MAIL, May 19, 2014

¹³ Zara Stone, “Everything You Need to Know About Sophia, The World’s First Robot Citizen”, FORBES, November 7, 2017

¹⁴ United States Patent and Trademark Office, *Manual of Patent Examining Procedure* (2015)

<https://www.uspto.gov/web/offices/pac/mpep/s1824.html>

¹⁵ Larry Hauser, *Artificial Intelligence* (2017)

¹⁶ 35 U.S.C S. 101

¹⁷ 566 U.S 66 (2012)

¹⁸ 134 S. Ct. 2347, 2355 (2014)

human using pen and paper”.¹⁹

The Court set out the following 2-fold test for determining patent eligibility:

- a) To determine whether the claims are directed to a patent-ineligible concept, such as an abstract idea; and
- b) If yes, then to consider “the elements of each claim both individually and ‘as an ordered combination’ and also to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.

The US Supreme Court has not defined what an “abstract idea” is and determines it by comparing the claim at issue with those that were found to be directed to abstract ideas in previous cases.²⁰

From the above decisions, it is clear that the US Courts do not recognize a mental process and the abstract concept of using mathematical algorithms to perform predictive analytics as they do not make a specific improvement on an existing computer-related technology and thus, they fall in the domain of patent-ineligible subject-matter. The US patent law gives much importance to specificity and technical contribution in establishing patent eligibility of AI. This is done to prevent preemption.²¹ As patents confer exclusive rights on the inventor for a fixed term, when patents are granted for a fundamental mental step, it excludes others from using it and also authorizes the patentee to file patent infringement lawsuit against infringers. This impedes innovation and industrial application.

Another issue regarding AI and Patent relates to liability in cases where AI is the violator of patent rights and who should be held responsible for actions taken by AI-the end user, the developer or the AI itself. Under US Patent law, infringement of a patent claim occurs when “whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor.”²²

To ascertain infringement, following two tests are followed:

- a) Determine the meaning of each term in a patent claim; and
- b) Show that the accused device meets each claim term, either literally or under the doctrine of equivalents.²³

US patent law also acknowledges “induced infringement” which has been interpreted to mean that the alleged inducer must have knowingly aided another’s direct infringement of a patent.²⁴

¹⁹ Synopsys Inc. v. Mentor Graphics Corp., 78 F. Supp. 3d 958, 963

²⁰ Enfish LLC v. Microsoft Corp. 822 F. 3d 1327, 1334 (Fed. Cir. 2016)

²¹ McRO Inc. v. Bandai Namco Games America Inc., 837 F.3d 1299, 1303 (Fed. Cir. 2016)

²² 35 U.S.C Section 271(a)

²³ Catalina Mktg. Int’l Inc. v. Coolsavings.com Inc., 289 F. 3d 801, 812 (Fed. Cir. 2002)

However, US patent laws presently do not acknowledge a finding of patent infringement that is independent of human involvement and do not address how liability or damages should be handed for patent infringement by AI.²⁵ The European Parliament Resolution of 2017 explains that AI cannot be held liable *per se* for acts or omissions that cause damage to third parties. Instead, AI's act would have to be traced back to a human agent, such as its manufacturer, operator, owner or user, if that agent could have foreseen and could have avoided AI's harmful behavior.²⁶ But with the rapid progress in AI's technology that it makes the legal responsibility arising from a robot's harmful action a crucial issue. It raises the question whether the ordinary rules of liability are sufficient or new principles and rules should be framed to provide clarity. Holding the manufacturer liable for patent infringement is a common practice in patent litigation and also under product liability. The European Parliament Resolution suggests for creating an obligatory compensation scheme which would take into account all potential responsibilities in the chain instead of just people's actions. Another option is to hold the AI itself liable, which would require recognizing AI as a legal person or legal entity.²⁷ Also, the resolution suggests that the liability of damage should be proportional to the actual level of instructions given to the AI and the degree of its autonomy, so that the greater an AI's learning capability or autonomy, and the longer its training, the greater the responsibility of its trainer should be."²⁸

- **IP protection for AI in India**

The Copyright Act, 1957 and Patents Act, 1970 will have certain implications with AI systems being included in the IP regime.

The basic element and pre-condition to copyright is "*originality*". A work is granted copyright protection only if it is original i.e. not copied from any existing work. However, it is not necessary that the work should be a novel expression of thought. The Act merely requires the work should not be copied from any earlier work and should be composed by the author himself.

The following doctrines or principles are applied to test originality of a work:

- a) **Sweat of the Brow Doctrine**

As per this doctrine, an author can get a copyright on his work by employing simple diligence and there is no requirement of substantial creativity or originality. By virtue of the efforts and expense put in by him in creating the work, he is entitled to copyright protection.

²⁴ Shlomit Yanisky-Ravid and Xiaoqiong Liu, "*When Artificial Intelligence Systems Produce Invention: The 3A Era and an Alternative Model for Patent Law*", March 1, 2017

²⁵ Bridget Watson, A Mind of Its Own- Direct Infringement by Users of Artificial Intelligence Systems, IDEA 58(1), 65, 69 (2017)

²⁶ European Parliament Resolution, February 16, 2017

²⁷ Nicolas Petit, Law and Regulation of Artificial Intelligence and Robots: Conceptual Framework and Normative Implication, March 9, 2017

²⁸ European Parliament Resolution, February 16, 2017

b) Modicum of Creativity

As per this doctrine, originality in a work subsists where sufficient amount of intellectual creativity and judgment has gone into creating such work. The degree of creativity need not necessarily be high but a minimum level of creativity and judgment should be present for copyright protection.

Both these doctrines are extreme in view as the former shifts the balance of copyright protection in favor of the owner and fails to protect the public interest in maximizing the production and dissemination of intellectual works. While the latter, implies that something must be novel or non-obvious, which is more associated with patents than with copyright.

Adopting a middle road approach the Indian Supreme Court in **Eastern Book Company & Ors. v. D.B Modak & Ors.** held that to claim copyright in a compilation, the author must produce a material with “exercise of his skill and judgment” which may not be creativity in the sense that it is not novel or non-obvious, but at the same time it is not the product of mere labor and capital.

After analyzing the judgment, it can be said that AI systems can achieve modicum of creativity and can pass the test of originality.

However, Sec. 2(d) of the Copyright Act which defines “author” poses a challenge to copyright the works of AI.

Sec. 2(d) (vi) provides that “author” in relation to any literary, dramatic, musical or artistic work which is computer-generated means the person who causes the work to be created. The major problem with the definition is the phrase of “the person who causes the work to be created”. But for AI to be regarded as author, they must first be given legal status and must be recognized as a legal person or legal entity.

Coming to the Patent Act, Sec. 2(y) does not specifically state that the “true and first inventor” should be a human and thus, it provides scope for the inclusion of AI systems into the patent regime. But after analyzing the definitions of “patentee” and “person interested” it implies that the inventor should be a person i.e. a legal person.

Thus, from the above it is clear that the position of AI under the Indian IP laws is similar to that of USA.

V. CONCLUSION & SUGGESTIONS

In today’s world, technology is progressing at an exponential rate and can be expressed by an exponential curve. The curve is becoming expensively steep, which will leave our intuition and experience behind. Thus, the future of the world with AI has a lot of potential but how precisely AI will develop and be used in society in the future is still unknown.

The present IP laws of India and USA do not cover AI but are capable of adapting themselves to future evolutions in AI technology. The US legal system embodies the tradition of common law, formed through the course of judicial decisions. Although the role of judiciary is not to create law but to apply existing law, the nature of common law is such that it has scope for policy arguments and incorporates the growing and advancing AI within its ambit.

Certain provisions of the Indian IP statutes act as a road block in the development of AI systems and deny IP protection to the works produced by AI. Thus, suitable amendments should be made to incorporate AI and other advanced and sophisticated technologies.

The term “invention” has no concrete definition under any country’s patent regime. On one hand, the European Patent Convention does not define “invention” while on the other hand; the Japanese Patent Act provides a broad definition of it. This increases the breadth of the interpretation of statutory language such as “invention” and “technology” and makes them capable of evolution.

The judicial evolution has already taken place in response to technological innovation. In 1998, the European Patent Offices’ Technical Board of Appeal denied patent to a system that automatically summarized documents on the ground of lack of technical character. But in 2015, the Board conferred patent eligibility to a similar invention on the ground of having technical character. These cases showcase a change in how the Board construes the concept of “technical character”.

The researcher would finally suggest that the incorporation of the AI-generated materials into the IP regime can be done in following ways:

- a) The present standard on patent-eligible subject matter must be carefully evaluated to determine whether it has any negative impact on AI or AI-generated technologies. If yes, then the legislators must make suitable adjustments to the standard so that it can achieve patent law’s main objectives. The benefits must be weighed against the negative social and ethical implications that may arise from those changes.
- b) The question whether inventions created entirely by AI should be protected with patents must be answered. To have a possible solution, the legislators must analyze the potential positive and negative effects- from technological, socio-economic and ethical viewpoints- from patenting AI-generated materials, and then assess these effects in view of one another. If the AI-generated materials are granted patent protection, then the legislators must also decide whether inventor ship should be awarded to AIs that generated those inventive steps.
- c) The present patent regime does not cover a situation in which patent infringement has been caused independently by an AI. The legislators must determine “who” should be held liable in such situations

and how remuneration should be assessed. The existing liability frameworks must be analyzed to identify their relative positions, and new approaches should be found to make them function more effectively than their existing liability.

As the use of AI will become more prevalent, the actual people “of ordinary skill” that work in various industries will increasingly and obviously rely on AI. Excluding AI from the definition of “person of ordinary skill in the art” can fail to accurately reflect the real level of obviousness.