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Patentability of Artificial Intelligence: Understanding the Realm of Artificial Intelligence (AI)

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ABSTRACT

The rampant misappropriation by unauthorized use, reproduction, distribution, imitation of the genuine products, making of the duplicate copies for the market, have altogether resulted in the un-accounted exploitation of the human intellect. The Intellectual property recognizes the category of the properties created as a reflection of the intangible creation of the human intellect including inventions, literary- artistic works, designs, symbols, etc.

Thus, the Intellectual Property rights stand as a guardian shield striking a balance between the interests of the innovators to enable to earn recognition and earn some economic benefit and the wider public interest to use the benefits of such developments and innovations. But the unaccounted misappropriation of such rights of the innovators pose a serious threat to the rights of the creators, a fear of infringement of their rights and thus poses a challenge to the state to implement such protections and ensure such effectual remedies to these creators such that any sort of infringement can be checked and protection can be provided thereof.

Under the realm of a number of Intellectual Property Rights including Patents, Copyright, Trademark, Geographical Indications etc., this paper would narrow down its area of analysis and focus on the applicability of Patent Rights over the Models and devices made with the system of Artificial Intelligence and the Patentability of the Creations of the Artificial Intelligence, and the tussle between the owner of such Patent Right- The Creator or the AI, who gets the rights and to what extent. The Artificial Intelligence, the machine learning systems, can create inventions which are equally capable of patent protections like the creations of human beings, thus this paper aims at identifying the patentability standards of the creations of such AI, the conflict about the appropriate ownership of such patent protections and the scope of law that needs modifications to imbibe and incorporate the possibility of such protections. Thus, it calls upon the new policy makers to appropriately modify the law governing the patent system to include the era of 3A comprising of the advanced, automated and autonomous AI Systems.

Keywords: Patent, Artificial Intelligence, Inventorship, Creator, Owner of Patent Protection, etc.

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I. INTRODUCTION

The earliest foray into the realm of Artificial Intelligence (AI) arguably arose in 1956, during a summer workshop at Dartmouth College where there was a study on “*the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it*”. More than 60 years later, that attempt to explore how machines could be made to use language and form abstractions and concepts in order to solve problems that so far were the sole preserve of humans. It is predicted that by 2020, AI will drive up to \$33 trillion of annual economic growth. The creation of new technology is often followed by protection of intellectual property, and in the case of AI, patents seem to be the most obvious form of protection. However, what lies in store for this magnificent technology depends on how IP regimes deal with the concept of AI and whether its implications, both societal and legal, are clearly understood. As one theorist surmises: “By far, the greatest danger of AI is that people conclude too early that they understand it.”

That is why the World Intellectual Property Organization (WIPO) chose AI as the first topic in its new WIPO Technology Trends research series which has become the latest and the most trending field of research and discussion in the realm of Intellectual Rights Protection.

II. MEANING OF ARTIFICIAL INTELLIGENCE

Several definitions of AI exist, and one author has suggested that the definition changes based on the goals that are trying to be achieved with an AI system. **India’s 18-member task force** defines AI as “*the science and engineering of making intelligent machines, especially intelligent computer programs*”, with ‘intelligence’ being “*the computational part of the ability to achieve goals in the world*”. Further, the NITI Aayog discussion paper categorizes AI as “*a constellation of technologies that enable machines to act with higher levels of intelligence and emulate the human capabilities of sense, comprehension and action*”.

Gartner Inc, a leading research and advisory company, has an apt and instructive definition of AI, and lays down: “*Artificial intelligence is technology that appears to emulate human performance typically by learning, coming to its own conclusions, appearing to understand complex content, engaging in natural dialogs with people, enhancing human cognitive performance... or replacing people on execution of nonroutine tasks.*”

III. SEEKING THE SOURCE

- The Historical Background behind the development of Artificial Intelligence

Artificial intelligence (AI) emerged in the 1950s, with the first mention of the term coming

during the Dartmouth Summer Research Project on Artificial Intelligence in 1956. Since that time innovators and researchers have published over **1.6 million** AI-related scientific publications and filed patent applications for nearly **340,000** AI-related inventions. But the history of AI hasn't always been smooth sailing. Periods of optimism, success and growth were followed by disappointment, contraction and regrouping; AI "summers" gave way to AI "winters" as the nascent discipline struggled to find its feet. Recent rapid growth in computing power and communications technologies has enabled the compilation and sharing of large volumes of data, opening up many new areas for AI technological development.

IV. PRIORITY OF ARTIFICIAL INTELLIGENCE AND THE GLOBAL INTELLECTUAL PROPERTY (IP) COMMUNITY

World Intellectual Property Organization² (WIPO) defining Intellectual Property as “*creations of the mind, such as inventions*”, the definition of “mind” in this context is left for debate: Whether a human mind or a robot mind. Still, AI can only create potentially patentable inventions. With this in mind, a human creator of AI technology that creates its own patentable inventions would logically own those patent rights. Some countries around the world have already accepted and modified their patent laws to include the Artificial Intelligence where as some countries are still struggling to imbibe such advancements of the modern digital world that stand as a challenge to the Human existence itself.

The fundamental goals of the Intellectual Property (IP) system have always been to encourage new technologies and creative works, and to create a sustainable economic basis for invention and creation. From a purely economic perspective, if we set aside other aims of the IP system, such as “*just reward*” and “*moral rights*”, there is no reason why we shouldn't use IP to reward AI-generated inventions or creations. But this still requires some thought.

The broad use of AI technologies will also transform established IP concepts – patents, designs, literary and artistic works, and so on. This is already happening, but is a consequence of the digital economy, not in the field of AI alone. For example, the life sciences generate enormous quantities of data that have significant value but don't constitute an invention in the classical sense. So, we need to work out the rights and obligations that attach to them. Thus, there lies the inherent clash between the identification of the proper authorship and inventorship and creation that could come under the realm of protection under the Intellectual Property Rights.

² World Intellectual Property Organization, Geneva, Switzerland, Founded in 1967.

There are three key factors propagating the use of Artificial Intelligence in the administration of IP systems. The first is volume. In 2016, the last year for which data are available, around 3.1 million patent applications, along with some 7 million trademark applications, and 963,000 industrial design applications (covering 1.2 million designs) were filed worldwide.

Top Fields for Artificial Intelligence are³

- **telecommunications**: computer networks/internet, radio and television broadcasting, telephony, videoconferencing, and VoIP
- **transportation**: aerospace/avionics, autonomous vehicles, driver/vehicle recognition, transportation and traffic engineering
- **life and medical sciences**: bioinformatics, biological engineering, biomechanics, drug discovery, genetics/genomics, medical imaging, neuroscience/neuro-robotics, medical informatics, nutrition/food science, physiological parameter monitoring, public health.

V. LANDMARK CASE LAWS ON PATENTABILITY OF ARTIFICIAL INTELLIGENCE

The cases on Patent laws of the US on Artificial Intelligence :

Title 35 of the United States Code, Section 101 (hereinafter 35 U.S.C. § 101) limits patentable subject matter to “new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”. Patent claims that are directed to abstract ideas (e.g., a mathematical algorithm), natural phenomena or laws of nature are not eligible for patent protection. But the Supreme Court of the United States explained that “*they are the basic tools of scientific and technological work,*” and that *granting monopolies on those tools through patent rights might impede innovation.*

A Development through case laws :

1. The US Supreme Court, in *Alice Corporation Pty. Ltd. v. CLS Bank International*⁴, recently made it increasingly challenging for all applicants to procure patents on software or “computer-implemented inventions”, as the court held that it could be very well be performed by the “Human Minds” and thus does not need any form of patent protection.

2. In *Blue Spike, LLC v. Google Inc.*⁵, applying the Alice test, the court came to the conclusion that the patent claims covered a general purpose computer implementation of “an abstract idea long undertaken within the human mind” because they sought to model “*the*

³ ‘*The Story of AI in Patents*’, a study by the World Intellectual Property Right Organization, US.

⁴ *Alice Corporation Pty. Ltd. v. CLS Bank International*, 2355 (2014) (US).

⁵ *Blue Spike, LLC v. Google Inc.*, No. 16-1054 (Fed. Cir. 2016) (US).

highly effective ability of humans to identify and recognize a signal” through a computer. After subsequent finding that the claims shallowly covered “*a wide range of comparisons that humans can, and indeed, have undertaken since time immemorial*” – and thus lacking any “*inventive concept*” – the court ruled that the claims were invalid.

This trend has made it furthermore challenging for patent applicants to obtain AI patents during prosecution or for patent owners to defend the validity of their patents during the pendency of litigation.

VI. PATENTABILITY OF ARTIFICIAL INTELLIGENCE IN INDIA

To understand the recent trends in AI, in 2017 India’s Ministry of Commerce and Industry set up the 18-member Task Force on AI for India’s Economic Transformation⁶, with the mandate to advise on the creation of certain frameworks to promote deployment of AI. Further, in June 2018, government think-tank NITI Aayog released a discussion paper India’s National Strategy for Artificial Intelligence, espousing Artificial Intelligence for economic growth, social development and inclusive growth, while establishing AI as a ‘garage’ for the emerging and developing economies under the proposed brand ‘#AIforAll’. Hence, the first step on India’s journey from AI outlier to AI adopter – and, subsequently, to AI creator – has already commenced. However, there has been no discussion on the legal implications of AI as to its fundamental question as to how it is created and protected; there is also the more fundamental question of who owns AI.

- **Implications of Artificial Intelligence on Patent Law in India**

The legal implications of AI in India are unknown at present. Whether the present standard under the Indian Patents Act 1970⁷ promotes or stifles innovative technologies in the electronics/ computer space is a question that has been debated for many years in India in the context of Section 3 – specifically Section 3(k) – of the Patents Act⁸.

For the uninitiated, the Indian Patent Office’s on the patentability of CRIs i.e., the Computer Related Inventions lacks the clarity that can be credited, for example, to the European Patent Office (EPO). India’s CRI guidelines have been debated extensively in recent years and the patent office has reacted to each debate with dramatic changes in its guidelines.

Thus, three main issues stand out from a patent perspective:

⁶ ‘*Commerce and Industry Minister Sets up Task Force on Artificial Intelligence for Economic Transformation*’, PIB, GOI, MCI, Aug 25, 2017 (India).

⁷The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970

⁸The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 3(k)

1. whether AI as an invention is eligible subject matter;
2. who is the true and first inventor (i.e., inventorship); and
3. who owns, and is therefore liable for, the acts of the AI technology (i.e., liability).

Subject-Matter Eligibility

There is perpetual debate on whether awarding patent rights to CRIs can encourage investment in software-related research and thereby promote innovation. The middle ground is a more sensible option and the Indian Patent Office should address this issue quickly. Open discussions are necessary for creating a solid framework for patenting. The EPO has already held its first conference on AI and patenting; if India wants to be one of the leaders in AI, it must adapt its patent regime to ensure that the country remains an opportunity for innovators. The government must ensure that AI's impact on patents is dealt with systematically and to the benefit of the technology community, especially if India is to become a creator of AI, and not a mere adopter.

Inventorship

There is no ambiguity in regard to who would count as the inventor for AI-based inventions that involve human intervention. **The question arises: should AI technology be considered an 'inventor' when it is that technology (i.e., not a human) that creates further inventions that are patentable?**, the answer is unclear. Section 6 of the Patents Act⁹ states that an application for a patent for any invention can be made only be made by the true and first 'inventor' of the invention or an assignee.

Section 2(1)(p)¹⁰, is the "person" entered on the patent office register as the grantee or owner of the patent. Intuitively, this *suggests that an inventor and person must mean a natural person*. However, Section 2(1)(s)¹¹ defines 'person' to include the government, a non-natural entity. Moreover, *'true and first inventor' has an exclusionary definition and there is no mention of a natural person (Section 2(1)(y)¹²)*. Thus, the Patents Act arguably does not require a particular threshold of human control or input in the invention process for granting patent rights per se, and frames the questions of inventiveness in terms of creation (i.e., "*new product or process*" or "*technical advance as compared to the existing knowledge*", in *Sections 2(1)(j)-(ja)¹³*). While these provisions do not expressly impose the requirement for

⁹The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 6

¹⁰The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 2(1)(p)

¹¹The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 2(1)(s)

¹²The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 2(1)(y)

¹³The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 2(1)(j)

an inventor to be a natural person, the predisposition appears to require human intervention for an invention to be considered patentable.

Questioning the credibility of Sofia, a Humanoid -

The first order of business is to decide whether an inventor must be a natural person, with a keen observation in mind that Saudi Arabia granted citizenship to Sophia, a social humanoid robot; so, would Sophia be considered a 'natural person' to qualify the requirements of patentability in India is Still a grey area with no conclusive answer.

Liability: Who owns the liability

Section 48¹⁴ of the Patents Act confers on the patentee "the exclusive right to prevent third parties, who do not have his consent, from the act of..." The pertinent question here is whether AI has the power to give consent. If it does, how would someone receive the requisite consent? The same issue lies with ownership through assignment or acquisition. If ownership of the invention is transferred to a business entity that can enforce the patent, does an AI have the power to assign (i.e., give consent for change of ownership) is another very pertinent question. Thereafter, once patent infringement is established, the infringer would have to pay damages to the patent owner in an amount adequate to compensate for the infringement (usually in the form of lost profits or reasonable royalties), and in certain cases would be enjoined or prohibited from performing the infringing activity. Thereby, the question lies, How would the courts enforce this on an infringing AI? Does the legal responsibility arising through an AI's illegal action lie with the AI, its owner or its user or operator? If the cause of the illegal act cannot be traced back to a specific human actor, who has liability?

These and many similar concerns are now the subject of debates on the ambiguities of AI, not only in the IP context, but also in the context of criminal liability or civil tort liability. Legal scholar Gabriel Hallevy has discussed three models of criminal liability that are instructive in appreciating the issues at hand.

- The first is the 'perpetration-via-another' liability model, wherein mens rea is not attributable to an AI entity and the perpetrator would be either the programmer of the AI software or perhaps the end user.
- Second, the 'natural-probable-consequence' liability model assumes deep involvement of the programmers or users in the AI entity's daily activity, but

¹⁴The Patents Act, 1970, Act No. 39, Acts of Parliament, 1970, § 48

without intent to commit an offence. However, since ignorance of law is not a defence, this assumes that the programmers or users of an AI should have known about the probability of the commission of the specific offence, and hence holds them to be liable.

- Third, the ‘direct liability’ model focuses on the AI entity itself, and suggests that the AI entity would be liable as if it were a human.

VII. CONCLUSION

The current patent system is best suited in adjudicating the patentability questions related to the current generation of AI technology. However, the time has come for the Indian government to begin carefully considering how CRIs pertaining to the next generation of Artificial Intelligence (i.e., strong AI and superintelligence) and the inveterate problem of associating legal responsibilities upon it and having a check and control over the same.

It calls for determination whether a machine with such capability can be seen as an inventor. Once this question is answered, the other aspects will eventually fall into place. While one ruminates on the policy issues, a fascinating practical point to ponder is that if artificial intelligence lives up to its hype, and the superintelligence in AI is achieved, then would not the AI then be able to decide whether it has created patentable subject matter, review the prior art and approve or reject its own application – and, if patented, find infringers with.
