PATENTING ARTIFICIAL INTELLIGENCE: LEGAL IMPLICATIONS[1]

"By far the greatest danger of Artificial Intelligence is that people conclude too early that they understand it"

-ELIEZER YUDKOWSKY

INTRODUCTION

Artificial Intelligence (AI) is broad term for technologies and systems making it possible for the computers to perform tasks involving Human-like decision making, Intelligence, learned skills and expertise.

The term was first coined sixty years ago, around 1956, during a summer workshop at Dartmouth College that studied "*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 stimulate it*". People started trying to understand whether machines can truly think. Since then there have been a lot of advances in search algorithms, machines learning and statistical analysis into understanding this system over the past sixty decades.[2] The term Artificial intelligence covers a wide range of capabilities. Some futurists such as Stephen Hawking and Sam Harris fear that AI could one day pose an existential threat, a "super intelligence" that might quest for the goals that prove not to be aligned with the present existence of humankind. Such fears relate to "strong" AI or "artificial general intelligence" (AGI), which is equivalent to human-level awareness, but it does not exist yet. More than sixty years later, an attempt was made to derive how machine uses language and form concepts in order to solve the problems, it is predicted that by 2020, AI will drive up to $33 trillion of annual economic growth.

WHAT IS ARTIFICIAL INTELLIGENCE?

The ability of the computer to take decisions by itself came to be known as artificial intelligence. The term 'artificial intelligence' was officially coined by Mr. John McCarthy, a

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[1] Sheikh Sadab Rana, The ICFAI Law School, ICFAI University, Dehradun.
[2] The History of Artificial Intelligence, History of Computing CSEP, University of Washington, December 2006.

computer scientist at a conference in 1956. According to him, it was the notion of a program, processing and acting on information, such that the result is parallel to how an intelligent person would respond in response to similar input.[3] Progress in AI has shown tremendous potential for benefitting mankind by improving efficiency and saving in commerce, transport, education, farming and medical care and as well as for cultivating " the level of social governance and its ability".

A question comes in this system that whether the results being furnished by the machine are the outcome of its own intelligence, or algorithms and commands. To deal with this issue, Sir Alan Turing proposed a test called 'Turing Test'.[4] The test called for the users to transposed with a machine/human in a text only format, and then suggest whether they believed they communicated with a human or a machine. As per Turing, an AI machine showed intelligence if the responses submitted by the same were identical from real human responses. While this test worked for a long time, its application was restricted only to speech machines and certain test purposes.

The essential building blocks of AI are:

- *Natural Language Processing* is an area that includes understanding of the computer and interpreting man's language. These technologies studies human speech for syntax and meaning.

- *Artificial neural networks (ANNs)* are computing systems impelled by the biological neuronic networks. They are doing their task by considering examples, generally without task-specific programming.

- *Large-scale machine learning* which concerns the design of learning algorithms, as well as grading existing algorithms, while working with the large number of data sets.

- *Collaborative systems* investigate models and algorithms to help develop autonomous systems that can work collaboratively with other systems and with humans.

- *Reinforcement learning* is a model that shifts the concentration of machines learning from pattern recognition to experience- driven serial decision making.

AI's technological eruptions dramatically accelerated in the last two decades, fuelled by advances in algorithms, exponential growth in the availability of data, and developed and

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[3] Raquel Acosta, *Artificial Intelligence and Authorship Rights*, HARVARD JOURNAL OF LAW AND TECHNOLOGY (Feb. 17, 2012), http:// jolt.law.harvard.edu/digest/copyright/artificial-intelligence-and-authorship-rights.
[4] Alan Turing, Computing Machinery and Intelligence, 59 MIND 236, 433–60 (1950).

cheaper computing power.[5] The technological progress of last decade has led to AI's ability to perform activities which used to develop certain cognitive features e.g. like the ability to learn from the experiences and take quasi-independent decisions. In 2013, an AI language system developed by the Massachusetts Institute of Technology, surprisingly matched the verbal IQ of an average four year old child, dramatically surpassing its 2010 performance in which it was merely able to compete with the verbal IQ of a one year old child.[6]

Human-Decision making process is largely increased by the AI and its potential to counter cognitive bias and making rapid sense of extremely large data sets. For example, at least one venture capital firm has already appointed an AI application to ascertain its financial decisions.

And because of the less participation of Human Action it will be necessary for some applications like for instance automated vehicles. However by totally depending on the AI decisions having the negative aspects also because we don't know exactly how the system making those decisions.

ARTIFICIAL INTELLIFENCE AND INNOVATIONS

With the Arrival of autonomous vehicles, computerized medical diagnosis, including the low cost medical diagnosis expert systems, use of automated drones in Emergencies, many other things to improve the efficiency and effectiveness of their operations. AI could be seen to be helpful in the complex challenges of this century like in determination of climate change, impact of population growth etc.

Industrial robots

Use of Robots on the manufacturing process having the significant role and their use in manufacturing process is increasing day by day. The industrial robot market was figured to be worth USD 29 billion in 2014 (including the software cost, peripherals and systems engineering). The number of robots sold is increasing, reaching about 230,000 units sold in 2014, up from about 70,000 in 1995, and this data is estimated to further increase more in the

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[5] Data is expected to grow to 163 zettabytes (i.e. 163 trillion gigabytes) by 2025, which is 10 times the 16.1 ZB of data generated in 2016. See David Reinsel et al., Int'l Data Corp., "Data Age 2025: the Evolution of data to life-critical (April 2017), https://www.seagate.com/files/www-content/ our-story/trends/files/Seagate-WP-DataAge2025-March-2017.pdf.

[6] Anthony Cuthbertson, *"Artificial intelligence program ConceptNet matches 4-year-old child in IQ test"*, Int'l Business Times (7 October 2015), http://www.ibtimes.co.uk/artificial-intelligence-program-conceptnet-matches-4-year-old-child-iq-test-1522836.

next upcoming years. Industrial Robots helpful in reducing the production cost, enhance the product quality, helpful in improving the labor productivity. In Service sector also it enables the new business models, providing assistance to disabled peoples and they have capability to meet with the social challenges and provide solutions for that as well like providing care facilities to aging population and achieving environmentally friendly transportation system.

AI in our daily life

AI application we can be seen in our daily life as the Camera face recognition capability of any of our camera is AI, whenever we use Credit card AI approves the transaction, The GPS in our car, we use an AI algorithm.[7]

Autonomous vehicles

Autonomous vehicles attract various car companies or internet firms. They contended that it will be helpful in reducing road accidents by implementing auto-parking system, cruise control, ease congestion, fuel efficient etc. But it threatens the jobs of millions of Drivers currently employed, privacy will also be the major concerns there will be threat to intrusion.

The European project **SARTRE** is piloting the concept of "**autonomous car platoons**," which allows multiple vehicles to drive autonomously within meters of one another at highway speeds, controlled by a professional pilot vehicle. This approach is anticipated to fuel efficient and emissions by up to 20 percent, improve road safety, and reduce traffic congestion.

PATENT LAW & ARTIFICIAL INTELLIGENCE

Emerging AI is increasing concern for making various risks present because decisions are made by the computers not by the humans. AI necessitate a huge amount of data to access but there are poor legislations and government policies that can reduces the risk of AI intervention activities. However, the policymakers are challenged to draft legislation that does not asphyxiate or stifle AI innovations, and also at the same time protects the public from possible dangers acquainted when computer judgment replaces human.

The reciprocal action between AI and Patent laws is increasing in today's technical world. Use of AI is increases in order to simplify the execution and reduces the human efforts. At a glance

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[7] Artificial intelligence: Potential Benefits and Ethical Considerations, Rossi, European Parliament, at http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/571380/IPOL_BRI%282016%29571380_EN.pdf.

we have been seen AI works very quickly. However it works in a very complex and complicated manner. Today AI make the system capable to perform tasks based on their own key learning, generating the possibilities to invent something. Although it is great development from technological standpoint but challenging point from the legal standpoint i.e. from the perspective of patent law.

Patentability and Inventorship issues for AI generated inventions

With the new technology, there is always a challenge on how to protect the intellectual property operating in the unexplored area. And because of abundant growth in artificial intelligence technology and application obligate many to claim that existing patent protection mechanism will not satisfy the new industry. Scholars started to deal with issues with inventorship and with the obviousness standard for AI technology.

First, with inventorship, the central question is—who will own the patents for inventions created solely by artificial intelligence? But the major challenge with the U.S. patent system that required Human inventiveness for inventorship. The U.S. patent system based on the conception, which require "the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention," for an invention.[8] Different scholars have provided different views on inventorship issue of AI. **Professor Abbott** argues that treating nonhuman artificial intelligence as inventors would incentivize the development of creative computers.[9] **Professors Ravid and Liu** suggests that efforts to identify a single inventor of artificial intelligence systems are not applicable, and instead that a Multiplayer Model, which involves contributions from many players based on their indirect and insignificant involvement, should be utilized but would not meet the current threshold for inventorship.[10]

LEGAL FRAMEWORKS FOR THE AI PATENTS IN U.S.

US patent law (35 U.S. Code Article 101) explains who may obtain a patent and what constitutes a patentable inventions:

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[8] Sewall v. Walters, 21 F.3d 411 (Fed.Cir. 1994); *See* U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2138.04 (9th ed. 2018).

[9] Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C.L. REV. 1079 (2016).

[10] Shlomt Yanisky Ravid and Xiaoqiong Liu, When Artificial Intelligence Systems Produce Inventions*: The 3A Era and an Alternative Model for Patent Law, CARDOZO L. REV. (forthcoming 2018).

Whoever invents or discovers any new and useful process, machines, manufacture or composition of matters, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.[11]

Patent claims that are directed to law of nature, mathematical algorithm are not eligible for the patent protection, Supreme Court of United States explained that they are basic tools of the scientific and technological work, and that if granted monopolies on those tools by the patent then it might trammel innovation.

The Supreme Court, in *Alice Corporation Pty. Ltd* v. *CLS Bank International*,[12] it become more challenging to obtain patents on software and computer implemented inventions. This decision has been applied by various lower federal courts to generally exclude patent claims directed to subject matter that could be performed through an ordinary mental process, in the human mind or by 'a human using paper and pen'.

Similarly, in *Blue Spike, LLC* v. *Google Inc,*[13] applying the Alice test, applying the *Alice* test, the court held that the patent claims covered a general purpose computer implementation of "an impalpable idea long undertaken within the mankind remembrance" because they sought to model "the highly impressive ability of humans to describe and recognize a signal" on a computer.

In the Case of *Townsend* v. *Smith*[14] , it was held that, for anything to be held as valid outcome of an invention, it must go through the stage of 'Conception', i.e., a permanent idea must have been conceptualize in the mind of the inventor before the same be put into the practice. With such an idea of Conception, it has been argued that such creative conception can only be occur in Human Mind.[15]

The U.S. Patent Act does not require any kind of input in the invention process for granting patent rights, but it frames the questions of patentability in terms of human creation. On the patentability issue some have argued that granting patent rights to AI-generated inventions would accelerate innovation. Other have argued that patent right do not promote innovation, irrespective of that whether the inventions are generated by people or AI. Under this view,

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[11] 35 U.S. Code Article 100–1.
[12] Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347, 2355 (2014).
[13] Blue Spike, LLC v. Google Inc., No. 14-CV01650-YGR, 2015 U.S. Dist. LEXIS 119382, 13-16 (N.D. Cal. 8 September 2015).
[14] Townsend v. Smith, 36 F.2d 292,293 (1929).
[15] FENWICK & WEST LLP, https:// casetext.com/case/townsend-v-smith/posts/can-a-computer-be-an-inventor.

there will be hampering of innovation because patents resulting from AI-generated inventions, will increase social cost and monopolies, and asphyxiate the entry of new ventures.

IMPLICATION OF AI UNDER PATENT LAW IN INDIA

The legal implications of AI in India are unsung at present. Whether the present standard under the India Patent Act,1970 promotes innovative technologies in the computer space and electronics is a question that has been deal with for many years in India in the context of Section 3- specifically Section 3(K) of the patent Act. It doesn't matter what the India's position, it is strident that this tumultuous phase is entered into in a planned manner and it is determined whether the government's initiatives regarding the industry sectors that have been identified. And it would be irrelevant to hit with the Computer-related inventions (CRIs).

There are three main issues regarding patent perspective:

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

There is no equivocalness as to who would be called as the inventor for AI-based inventions in which human intervention is there. But, as the transition is made from weak AI to strong AI (and, perhaps, towards superintelligence), the question arises: can AI technology be considered an 'inventor' when it is that technology (i.e., not a human) that creates further inventions that are patentable? At present, the answer is unclear. Section 6 of the Patents Act states that the patent application for any innovation and inventions can be made only by the true and first inventor of that invention or assignee. As the definition of 'patentee', under Section 2(1)(P), is the "person" entered on the patent office register as the owner of patent. This means owner here means natural person. However, Section 2(1)(s) defines the 'person' to include the government, a non-natural entity. Moreover, 'true and first inventor' has an exclusionary definition and there is nowhere mention of natural person {Section 2(1)(y)}. While these provision do not expressly require an inventor to be natural person, but sensitivity require human intervention for an invention to be patentable.

The Locke's Labor Theory

The Labor theory is given by John Locke, who wrote in his writing *Second Treatise of Government* that "every man has a property in his own person" which means nobody has right but to himself. We may say it as labor produced by his body and work of his hand, are his property. Thus, according to Locke's theory, an inventor has an ultimate right over fruits of his labor.[16]

There are two limitations on this theory and both limitations are appear to be fundamentally contradictory with patent law. The first limitation states that one can acquire property rights only where there is "enough and as good left in common for others". The second limitation demands that one acquire property rights to satisfy one's needs and no more. Although the Locke's labor theory may be inconsistent with patent law in general, especially in when we see in terms of granting patent protection to entities(instead of humans). Therefore, exact application of Locke's labor theory to patent law depends largely on the product or outcomes from one's contribution.

The Personality Theory

The Personality theory is based on the Hegel's observation that the property rights are a means for developing and realizing one's personality.[17] Hegel contended that "an idea belongs to its creator because the idea is a manifestation of the creator's personality". Accordingly, an AI system cannot be eligible for patent protection to its inventions or creations because personality is entirely ascribed to human beings.

CONCLUSION

The present position of AIs is in the law is not very clear, Stephen Hawking stated: "The short-term impact of AI depends on who control it, the long-term impact depends on whether it can be controlled at all." Traditional laws is no more pertinent under which behind every laws there was a many human inventor, but we are living in the new era of machines where no human behind the invention, invention is now that subject or area can be ultimate produce of machines. We are arguing this thing on the basis of some features AI system as follow: Creative, Rational, independent and autonomous, indeterminable, accurate and efficient. So, based on these feature

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[16] JOHN LOCKE, THE SECOND TREATISE ON CIVIL GOVERNMENT 20 (Prometheus Books 1986)(1690).

[17] G.W.F. Hegel, philosophy of Right (S.W. Dyde trans., Amherst, NY: Prometheus Books, 1996) (1821).

we can say that AI systems are capable to produce inventions which had been done by human that's why should be registered as patents.