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ANALYSIS OF PATENTABILITY OF INVENTIONS BY ARTIFICIAL INTELLIGENCE

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Abstract

Artificial Intelligence has made its impact on the lives of people in the present era. AI is something which no one thought of, no one could think that such things can be made possible in real life. The ambit of AI is quite big as it includes machine learning, computer vision, etc. AIis the ability of a machine to behave like an intelligent person. To illustrate it through an example we can look at the incident when a supercomputer named 'Deep Blue' defeated the then chess champion, Garry Kasparv. After this incident, a belief took place in the mind of the people that artificial intelligence is coming up to the status of the human mind. In AI the machines are designed in such a way that they possess similar acumen to that of human beings. Patent protection should be available for AI-generated works because it will incentivize innovation. The prospect of holding a patent will not directly motivate an AI, but it will encourage some of the people who develop, own, and use AI. Allowing patents on AI-generated works, therefore, will promote the development of inventive AI, which will ultimately result in more innovation for society. It is safe to say the concept of AI, be it ever evolving, is yet to be in tandem with the legal and other aspects of the society. It is yet to gain compatibility withthepatent laws on aglobal level. Apartfromencouraging creativity, there should be a cohesive effort to regulate and organize the growth of this humongous field. The idea of creating a humanoid or the concept replacement of human intelligence with machines and bots may sound futuristic and brazen, but will ultimately have a lasting impact on the mankind as a whole.

Keyword: Artificial Intelligence, Patent, AI, human intelligence etc.

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INTRODUCTION

Artificial Intelligence has made its impact on the lives of people in the present era. AI is something which no one thought of, no one could think that such things can be made possible in real life. AI has the capability to have an everlasting impact on humans and it is going to cover every aspect of society wherever it can reach.[2] AI which was mostly regarded as fiction is now being converting from fiction to science. With the change in time technology is also changing and as a result, AI is growing at a tremendous speed. With the help of existing technology, it can be ascertained that the day where the AI inventions will overpower human beings is not far away. AI of a machine can be calculated as its capability to copy intelligent behavior. The ambit of AI is quite big as it includes machine learning, computer vision, etc. AI is the ability of a machine to behave like an intelligent person.[3] To illustrate it through an example we can look at the incident when a supercomputer named 'Deep Blue' defeated the then chess champion, Garry Kasparov. After this incident, a belief took place in the mind of the people that artificial intelligence is coming up to the status of the human mind. In AI the machines are designed in such a way that they possess similar acumen to that of human beings. Predicting the future of technology is notoriously difficult. Indeed, predicting how law and regulation should be shaped to meet the needs of future technological developments is a task that might often lead to hilarious predictions. The difficulty in predicting technological development is certainly reflected in the current debate about the future of artificial intelligence (AI). Within this framework currently two extremes can be identified: those who view AI as a path towards 'superintelligence' that transcends humanity, and those who think AI is merely a glorified version of data analysis and statistical inference. In any case, it seems realistic to foresee that in the near future there will be an increase in machines that are able to perform more tasks in more efficient and autonomous ways than we currently can envision. These tasks include the production of artistic, technological, and scientific innovations that might potentially be protectable via intellectual property(IP) laws. Because of the economic value of these innovations there may be an interest

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[2]Lauren Goode, 'Google CEO Sundar Pichai compares impact of AI to electricity and fire', (*The Verge*, 19 January 2018) <https://www.theverge.com/2018/1/19/16911354/google-ceo-sundar-pichai-ai-artificial-   intelligence-fire-electricity- jobs-cancer> , accessed on 05/092021.

[3]Raquel Acosta, 'Artificial Intelligence and Authorship Rights' (*HJLT*, 17 February, 2012) http://jolt.law.harvard.edu/digest/copyright/artificial-intelligence-and-authorship-rights>   accessed on 05/09/2021

in 'controlling' such intellectual creations via intellectual property right (IPRs). In this context, a key question Relates to how to interpret the concepts 'inventorship' (patents) inventions generated by AI systems.[4] The modern era of innovation and scientific growth has been largely led by the rise of the machine age. The successful incorporation of automation capabilities with basic human intelligence have resulted in what is termed as "Artificial Intelligence". Artificial Intelligence is used in almost every field today ranging from automated vehicles, healthcare, aviation, finance, entertainment, education, heavy industries and so on. With each passing day, machines with higher and higher capabilities of learning and autonomous thinking are being conceived and implemented. AI has the potential to challenge the core standards that are edifice of Patent law. The granting of patent rights to AI-generated innovations would act as a catalyst for new and superior improvements which would be hard to obtain solely through human ingenuity. Artificial intelligence (AI) systems are growing at an exponential rate today, with more sophisticated forms of software being incorporated into them. AI enabled systems have transcended from performing simple calculations to producing poetry, art work, and other more complex creative work. This raises the question of whether or not such work can be afforded any special status under Intellectual Property (IP) laws, like any other form of work producedby an identifiable human source which is afforded protection under IP laws. AI questions the most conventional Intellectual Property legal principles, such as "creator","originality", or "inventiveness". Can a machine be an inventor? Should AI generated inventions be considered state of art? Who is the owner of AI generated works or inventions? Who should be held responsible for the creations and innovations generated by AI, if they encroach upon others' rights or violate other legal provisions? With the increasing prevalence, and increasing capability of AI these are some of the Intellectual Property Law issues that the legal fraternity has to resolve. This article proposes to address such issues and endeavors to provide suggestions so as to attune the law with the present developments.

CHAPTER 1:-DEFINING ARTIFICIAL INTELLIGENCE AND WORK GENERATED BY ARTIFICIAL INTELLIGENCE

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[4]N.P. Padhy, 'Artificial Intelligence and Intelligent System' (*Oxford University Press*, 2005) https://doi.org/1o.12728/culj.12.5> accessed on 05/092021.

Computers, coupled with human intelligence, have advanced to even make decisions on their own. This ability of a computer system to take decisions by itself came to be known as artificial intelligence, in common parlance. The term 'artificial intelligence' was formally coined by Mr. John McCarthy (is regarded as the propounder of the term 'Artificial Intelligence'), a computer scientist at a conference in 1956.[5] 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.[6] It was this reliance and curiosity towards machines that AI projects were developed in a manner which allowed for the performance of tasks requiring human-like creativity. In simple words, artificial intelligence can be defined as the ability of a machine to take decisions on its own.[7] AI can also amount to a technology that is able to understand unstructured data, learn automatically, able to have computer reasoning, etc. MIT defines AI as a program that behave (externally) like humans, that operate the way humans do, and possess rationality and intelligence as possessed by human mind. AI systems can be divided into two major categories:

- Weak AI, which is also known as 'applied AI', is an AI system that is designed and trained for a specific task – virtual personal assistants (eg, Siri from Apple) are a form of weak AI; and

- Strong AI, which is also known as 'general AI', is an AI system with generalised human cognitive abilities, that when confronted with an unknown task has enough intelligence to find a solution.[8]

All systems that we call "AI" today fall into the category of weak AI and can partially imitate human cognitive processes (eg, recognise images, speech or text). Strong AI, on the other hand, is not limited to one field of application (ie, universal intelligence). However, thus far, there is no strong AI in existence. In recent years, AI methods have been increasingly used in image processing to recognize objects (eg, in robotics, autonomous

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[5]Prof.A.Lakshminath&Dr.MukundSarda,'DigitalRevlutionandArtificialIntelligence-ChallengestoLegal Education and Legal Research' (2012) CNLU LJ (2).

[6]RaquelAcosta,'Artificial Intelligence and Authorship Rights' (*HJLT*, 17 February, 2012) http://jolt.law.harvard.edu/digest/copyright/artificial-intelligence-and-authorship-rights>accessedon05/092021.

[7]Mireille Bert &Jaap Koops, 'Bridging the Accountability Gap: Rights for New Entities in the Information Society?'11 MJLST 497, 549–5o (201o).

[8]SwapnilTripathi,'ArtificialIntelligenceandIntellectualPropertyLaw'(CULJ,2017),accessedon 05/10/2021

vehicles or medical diagnostics), while AI systems using natural language processing has made virtual assistant systems such as Siri or Alexa possible. These developments are also reflected in patent statistics. At the European Patent office (EPO), the proportion of computer-implemented inventions in the area of AI- related inventions rose rapidly between 1998 and 2014, especially in the automotive(upfrom 36% to 63%) and medical technology (up from 31% to 49%) sectors.[9]

CHAPTER 2:-A BRIEF HISTORY OF AI

There have been different philosophies on what true artificial intelligence would be, yet only recently has advanced AI technology begun to call legal assumptions regarding human authorship into question. Early research into AI encountered difficulties that arose partly due to the implicit notion that to be "artificially intelligent" a program must "process information such that the result parallels how an intelligent person would respond in response to similar input. Due to this reliance" on producing "human-like" results, many official AI projects developed to produce machines that could perform tasks requiring human-like creativity. However, artificial intelligence researchers have different perspectives on what it means for a machine to be "creative." In many ways, computational creativity involves the ability for a machine to take in input and process it in a way that results in a novel combination of pre-existing ideas and information.[10]

It is important to differentiate between strong AI — which requires innovative thinking and logical reasoning abilities — and weak AI, which merely creates a program tailored to the narrow function required. These different traditions have different legal implications. Weak AI merely requires that a machine act human, so a programmer would have direct control over the heuristics governing the form of the machine's output. While the programmers or users of weak AI machines use the machine as a tool, strong AI aims to get a machine to think for itself. Randomness, autonomy, and machine learning are built into strong AI systems, so the human

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[9]RainerKKuhnen,'Artificialintelligence:theimplicationsforpatents'(Lexology,11April,2019)<
https://www.lexology.com/library/detail.aspx?g=b852a63b-edb2-498f-b32f-6e717e7a632b>   accessed   on
15/o9/2021.

[10]WilliamT.Ralston,'CopyrightinComputer-ComposedMusic:HalMeetsHandel'(2005)52JCSUSA.281, 292–93.

connection is much more attenuated. As such, only the underlying software, rather than the output, is the result of human ingenuity and would be protectable under traditional copyright law.

CHAPTER 3: THE TURING TRADITION AND WEAK AI

In 1950 Alan Turing — perhaps the most prominent figure in the history of AI — proposed what became known as the "Turing test" to evaluate a machine's ability to appear human. Participants would converse with the machine or a human in a text-only format. They would then indicate if they believed they were communicating with a human or with a machine. Turing theorized that an AI machine could be considered "intelligent" if it generated responses that were indistinguishable from a real human's. Turing's functionalist approach triggered a series of "chatterbots," or programs which were designed to interact with humans in a realistic way. Chatterbots track innovations in natural language processing ("NLP"), and while many of the earlier chatterbots were in the tradition of weak AI, recent examples often incorporate machine learning ("ML") techniques.

IBM's Watson is, at present, the most highly evolved AI developed from the Turing tradition. Watson took advantage of cutting-edge NLP technology to win Jeopardy! against two reigning champions. Watson utilized ML techniques but only innovated along constricted parameters to achieve a narrowly-defined goal. Each question triggered a massive amount of parallel computing as Watson sorted through 500 gigabytes (or about a million books) of content per second. While this is an impressive technological feat, the nuances of human culture have as yet evaded quantification — when Watson was off in its answers, it tended to be drastically off. So for all Watson's massive computational ability, it was still was in the tradition of weak AI and specifically tailored to perform the task at hand.

CHAPTER 4:-MACHINE LEARNING AND STRONG AI

A key development within AI programs is the incorporation of dynamic processes we associate with intelligent life. In a shift away from weak AI, which focused on producing human-like output, some projects have begun programming in elements inspired from biological functions. Particularly salient are algorithms inspired by genetics and network structures based on neurological connections. Evolutionary algorithms, of which genetic algorithms are a subset,

generate solutions to optimization problems using strategies such as reproduction, mutation, and inheritance.[11]

Artificial neural networks were inspired by the inner workings of the brain and are oftenadaptive systems that change structure in response to information forms. Neural networks are generally "trained" by being provided with paradigmatic examples from the domain of interest — such as art, science, or technology. The network can learn by increasing or decreasing the dominance of any given neural node depending on the desirability or correctness of its output, just as neurons within a human brain reinforce commonly used neurological pathways but prune undesirable connections.

Using neural networks, Stephan Thaler built a "Creativity Machine" in 1994 that autonomously produced patentable inventions and composed music. The Creativity Machine consisted of two interconnected neural networks. one network had bits of information it had learned during training randomly deleted to generate some internal static , or "noise." The noise allowed it to generate novel output by filling in the missing information with patterns it extrapolated from training data. The other network was used to analyze the output and adjust the parameters of the first network to optimize performance. If the first network was too noisy, then it would generate output of dubious usefulness, yet if it was too constrained, it would not generate much at all.[12]

Early generations of the Creativity Machine created novel chemical patents and poetry. More recently, creativity machines have been used by the US military to design new weapons. The latest versions have incorporated self-training artificial neural network objects that essentially allow the machines to "dream" in a virtual reality and run simulations and exercise crucial skills that it can perfect in an ongoing bootstrapping cycle. While early creativity machines involved a high degree of tailored training, more recent examples can learn and train themselves with little to no human input beyond the initial engineering. As such, there are instances when there are no

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[11]AlanTuring,'ComputingMachineryandIntelligence'(1950)59CULJ236,0433–60.
[12]Ibid

creative human choices directly involved in the "creative" output of a fully autonomous machine, even if humans built the machine itself.[13]

CHAPTER 5:-WHY PATENT PROTECTION FOR AI-GENERATED INVENTIONS IS NECESSARY

Patent protection should be available for AI-generated works because it will incentivize innovation. The prospect of holding a patent will not directly motivate an AI, but it will encouragesomeofthepeoplewhodevelop,own,anduseAI.AllowingpatentsonAI-generated works, therefore, will promote the development of inventive AI, which will ultimately result in more innovation for society.

Also, patents can promote disclosure of information and the commercialization of socially valuable products. Patents for AI-generated works will accomplish these goals as well as any other patents. By contrast, failing to allow protection for inventions generated by AI would mean that, in the future, businesses may not be able to use AI to invent, even when it becomes more effective than people in solving certain problems. Such a scenario would also encourage gamesmanship with patent offices by failing to declare a filing is based on an AI- generated invention.[14]

Beyond providing protection for AI-generated inventions, AI should be listed as an inventor when it is functionally inventing because this will protect the rights of human inventors. Allowing a person to be listed as an inventor for an AI-generated invention would not be unfair to an AI, which has no interest in being acknowledged, but allowing people to take credit for work they have not done would devalue human inventorship. It would put the work of someone who merely asks an AI to solve a problem on an equal footing with someone who is legitimately inventing something new.

CHAPTER 6:-CRITERIA FOR PATENT ABILITY OF INVENTION BY AI

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[13]RalphD.Clifford,'IntellectualPropertyintheEraoftheCreativeComputerProgram:WilltheTrueCreator Please Stand Up?*'* (1997) 71 TLR 1675, 1678–79.

[14]RyanAbbott,
'TheArtificialInventorProject'(WorldIntellectualPropertyorganization)<http://www.wipo.int/patents/en/.>accessedon11/09/2021.

A crucial factor for any invention to be granted a patent is, whether or not it can pass the patentability criteria satisfactorily. This calls for it to possess novelty, an inventive step, and be capable of industrial application.[15] In the case of inventions by AI enabled systems/technologies, the biggest challenge toward obtaining of a patent is satisfying this three steps test. For indicating novelty, it becomes necessary for the invention to be different from whatever exists in the prior art. Generally, this requires a thorough perusal of the existing prior art by the inventor to successfully determine at the invention stage itself, whether or not his invention can be easily anticipated, or is an outcome of further research and a creative mental component. While an AI system will certainly have access to prior art, due to its overseeing human scientists feeding in information, is it truly independent, let alone capable to make a judgment on whether or not its invention can account for something novel? As to the question of an inventive step, if novelty itself is difficult to determine by the AI system, chances of making innovations on existing models or concepts which is not obvious to a person skilled in the art, is certainly more difficult to achieve. At present, AI is usually fed with pre-existing objectives which they are programmed to achieve.[16] The technology must first advance to equip these systems with a human-like intelligence so that judgment calls on new situations can be made by them. Furthermore, on perusal of cases on patentability of computer programs, etc., it can be noticed that, the Court has denied patents to programs simply because what they perform is mechanical rather than inventive. This is an important consideration, since AI is primarily running on computer programs devised to perform certain functions, subject to variations made by its human inventor.[17]

However, with countries like India removing their rigid requirement of only computer programs in conjunction with a novel hardware being eligible for a patent, if an AI enabled system created a software which can be used on generic machines, it would entail practical utility, perhaps in more than one industry, which allows satisfaction of the industrial application requirement within the patentability test. On a general note, current laws and guidelines need to be streamlined in a manner which may allow for inventions by AI to be granted patents. However, with several obstacles and

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[15]ThePatentsAct1970,s2(I);ThePatentsAct1970,s2(ja);ThePatentsAct1970,S.2(ac).

[16]RonaldYu,'ShouldanArtificial IntelligencebeallowedtoGetaPatent?'(Robohub,9Sept2021)

<http://robohub.org/should-an-artificial-intelligence-beallowed-to-get-a-patent/.>accessedon06/09/2021
[17]BilskvKapp0s,561U.S.593(2010).

confusions still existing over patentability and other aspects, deeper examination of the issues is required.[18]

CHAPTER 7:- WHETHER SOFTWARE-RELATED INVENTIONS ARE PATENTABLE SUBJECT MATTER

To understand this, the scope of patentable subject matter must be studied. Patentable subject matter refers to the types of inventions that are eligible to be patent protected. For this, states including India have statutorily created exceptions to patentability, while the US has incorporated it judicially. The Indian Patents Act 1970 (IPA) lays down that inventions such as algorithms, mere discoveries, computer programs *per se* and business methods are unpatentable subject matter and cannot be protected by this form of IP.[19]

APPROACH FOLLOWED BY USA

The US judiciary provides that abstract ideas[20], laws of nature and physical phenomenon[21] are ineligible for patent protection. However, a spur in computer-related and software-related inventions has placed the issue of patentability of machine-generated Securing a patent for technology- driven inventions, particularly in biology and medicine, has not been unprecedented in the US[22]. Cortica has successfully developed and patented autonomous AI that simulates the brain to process information. Recently, the US Court of Appeals in *McRo v Bandai Namco Games*[23] America, ruled in favor of a patent sought for a computer-related invention for 3D animated characters. The claim allowed computers to produce accurate and realistic lip synchronization and facial expressions that previously could only be produced by human animators. The Court emphasized that the claim is focused on a specific method to improve

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[18]BalajiSubramaniam, 'Patent 0ffice Reb00ts CRI Guidelines Yet Again: Rem0ves 'n0vel' Hardware Requirement' (Spicy IP, 5 July 2017) <https://spicyip.c0m/2017/07/patent-0ffice-reb00ts-cri-guidelines-yet- again-rem0ves-n0velhardware-requirement.html.> accessed 0n 16/09/2021.

[19]RobertPatrickMerges&JohnFitzgeraldDuffy,'*PatentLawandPolicy:CasesandMaterials'* (5thed, 2011) 7–8.

[20]IndianPatentsAct1970,S3.

[21]BilskvKappos561U.S.593(2010).

[22]DiamondvChakrabarty447US303,308(1980);FunkBrothersSeedCovKaloInoculantCo333US127.

[23]BenHattenbach&JoshuaGlucoft,'PatentsinanEraofInfiniteMonkeysandArtificialIntelligence'(2015) 19 STLR 32.

animation technology and that it is not a mere automation of a known manual process. It was thus considered patentable subject matter[24] under the US Patents Act (USPTA).[25]

APPROACH FOLLOWED BY INDIA

India has also progressively recognized computer-related inventions as patentable and framed guidelines for its protection. The guidelines state that inventions which involve the use of computers, their networks, or require one or more features to be realised wholly or partially by means of a computer programs are capable of patent protection. In 2015, the Delhi High Court in *Ericsson v Intex*[26], dealt with standard essential patents (SEPs) in mobile communication technologies. The Court relied on *VICoM Systems Inc*[27], where the European Union held that the determinative criteriain technology-driven inventions is whether the invention makes a technical contribution to known prior art. It was held that inventions that make a contribution to the art are patentable inventions. In *HTC v Apple*, the UK Court of Appeal considered the question as to whether an invention relating to touch sensitive screens was excluded from patentability[28]. The Court of Appeal concluded that merely because the invention is implemented in software, does not make the invention non-patentable. The Delhi High Court in India has adopted the same reasoning as the EU Courts.

Therefore, it can be safely concluded that computer/software-based inventions are being considered patentable subject matter across jurisdictions. It must also be noted that it is a well-established law that computer program/software are not patentable across states and do not fall under the domain of patent law in IP.[29]

CHAPTER 8:- WHO ARE THE INVENTORS IN AI RELATED INVENTIONS

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[24]McRoIncvBandaiNamco GamesAmericaInc(FedCir2016).
[25]35USC1952, S.101.
[26]TelefonaktiebolagetLMEricssonvIntexTechnologies(India)LimitedIANo6735/2014inCS(oS)No1045/ 2014 (2015) ('Ericsson').
[27][1987] oJEPo14.
[28]*HTCvApple*[2013]EWCACiv451.
[29]IndianPatentsAct1970,S.3(k);GuidelinesonCRIs,n(43).

Where an AI-related patent claim is considered valid, it remains to be seen who the inventorship may be attributed to.

US APPROACH

The USPTA defines an inventor to mean the 'individual… who invented or discovered the subject matter of the invention.'[30] The Supreme Court has even said that 'anything under the sun made by a man is patent eligible'.[31] Denying legal entities the status of inventorship, the Federal Circuit remarked that people conceive and not companies.[32] Thus, the US has explicitly sided with human ownership in patents for AI-based inventions.

INDIAN APPROACH

In India, the IPA defines a patentee as the person for the time being entered on the register as the grantee or proprietor of the patent.[33] Persons that are eligible to apply for a patent under the IPA are: (i) any person claiming to be the true and first inventor of the invention; or (ii) an assignee of the true and first inventor; or (iii) the legal representative of any deceased applicant.[34] However, the definition of 'true andfirst inventor' is an exclusionary definition and not self-explanatory. It excludes the first importer of an invention into India, or a person to whom an invention is first communicated outside India.[35] In practice, the true and first inventor in India is always assumed to be a natural person.[36]

A discussion of these provisions seems to suggest that, although AI-based inventions may be considered patentable, the current legal regime is neither flexible nor adept enough to recognize and regulate AI as the owner of such patents. An interpretation that assigns inventorship to AI seems farsighted. Therefore, if autonomous vehicles or automated voice recognition software are considered patentable, the ownership may be claimed by persons creating the software or persons

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[30]35USCS.100(f).

[31]*DiamondvChakrabarty*447US303,309 (1980).

[32]*NewIdeaFarmEquipCorpvSperryCorp*916F2d1561,1566n4(FedCir1990).

[33]IndianPatentsAct1970,S.2(p).

[34]IndianPatentsAct1970,S.6.

[35]IndianPatentsAct1970,S 2(y).

[36]Nishith Desai Associates, '*The Future is here: Artificial Intelligence and Robotics*' <http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Artificial_Intelligence_and_Robotics.pdf> accessed on 11/09/2021.

contributing to the resources and research and development of the invention, or both, but not the AI.

CONCLUSION

The patent law's "governance" and treatment of AI can have deep impactson innovation, the economy and society. Given how quickly AI is advancing, it is paramount that the relevant stakeholders – patent and non-patent professionals alike – proactively engage in further research and discussions with one another to find ways for the patent system to promote innovation while minimizing any negative social and ethical implications. The preceding sections of this article explored two main patent law issues affected by AI that merit further discussions. First, the present standard on patent-eligible subject matter needs to be carefully evaluated to determine whether it has any material negative impact on AI or AI- driven technologies. If so, the relevant actors must search for possible adjustments to the standard that can better achieve the patent law's main objectives, such as promoting innovation, disseminating useful information and incentivizing investment in helpful technologies. The anticipated benefits from the contemplated changes must then be weighed against the negative social and ethical implications that may arise from those changes. The relevant actors should also consider other available mechanisms for promoting and protecting AI innovation (e.g. laws on trade secrets or copyrights) to help assess whether any of the identified shortfalls in the patent law's subject-matter eligibility standardcanberectifiedthroughothermeans.Second,thequestionofwhetherinventionsthat are created entirely by AI should be protected with patents needs to be answered. To help arrive at an effective solution, the relevant actors must diligently analyse the potential positive and negative effects –

From technological, socio-economic and ethical viewpoints – from patenting AI-generated inventions, and then assess these effects in view of one another. Possible middle grounds between the competing interests must be identified to help the patent system achieve its main objectives in a wellbalanced manner. If the relevant actors ultimately decide to allow AI- created inventions to be patentable, then they must also decide whether inventorship should be awarded to AIs that generated those inventive ideas. More importantly, there is a need to formulate clear and widely accepted guidelines with respect to the application of patent laws to AI. While there is a clear demarcation between the inventor and the invention, with the advent of AI systems it is essential

that legislators address the question of inclusion of AI enabled systems under this category. With the increasing usage of these technologies and the widespread expanse of the solutions generated by the same, protection as an issue becomes an integral question. Questions of incentivizing human scientists to create more of such systems alongside the danger of granting complete autonomy to these super intelligent systems is an area wherein the need for proper guidelines is most urgent. Therefore, in the above scheme of things, it is safe to say the concept of AI, be it ever evolving, is yet to be in tandem with the legal and other aspects of the society. It is yet to gain compatibility with the patent laws on a global level. Apart from encouraging creativity, there should be a cohesive effort to regulate and organise the growth of this humongous field. The idea of creating a humanoid or the concept replacement of human intelligence with machines and bots may sound futuristic and brazen, but will ultimately have a lasting impact on the mankind as a whole.

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