ANALYSIS OF DEEPMIND'S ALPHAGO: ARTIFICIAL INTELLIGENCE AND THE FUTURE OF INTELLECTUAL PROPERTY LAW

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ABSTRACT

Artificial Intelligence(AI), the technological advancement of the era, has ventured into every aspect of life. AI has changed the perspective that we have towards everything in this world. The paradigm shift has also encroached into the field of law, especially laws related to the protection of Intellectual Property rights. It has rendered opinions of jurists irrelevant and thereby requiring new interpretation in the legal concepts and doctrines in the contemporary digital age. The world has awakened and various international forums and national committees are constituted to make concerted efforts towards addressing the issue. The World Intellectual Property Organisation (WIPO) started conducting dialogues and conversations on the policy matters of AI and IP. The synergy and better understanding between Intellectual property law and AI is the need of the hour. This paper deals with the evolution of Artificial Intelligence and their corresponding impact on different categories of Intellectual Property law like copyrights, patents, trademarks and others. The legislative measures taken by different countries, to adapt to the changes brought in by Artificial Intelligence, are compared and discussed in detail and thereby addressing the issues raised by "The WIPO conversation on Intellectual Property and Artificial Intelligence". The issues relating to the ownership or authorship that may arise due to the development of Artificial General Intelligence (AGI) and the steps to be taken in order to resolve them are provided in the paper with the help of suitable examples of Artificial Intelligence machines and software like Deepmind's AlphaGo.

Keywords: Artificial Intelligence; Intellectual Property; World Intellectual Property Organisation; Artificial General Intelligence; Deepmind's AlphaGo.

Introduction:

Artificial Intelligence, one of the pioneer developments of the digital world, has emulated the intelligence of humans and provided greater assistance to the people across various branches of the society. They are designed to learn from patterns, make decisions and achieve targets assigned to them. It encompasses various sub fields such as machine learning, deep learning, language processing, pattern analyzing, robotics and computer vision. As the technology based on AI has grown to new levels, the issues associated with the development have also attained new dimension. The purpose of this paper is to address the issue with respect to the impact of Artificial Intelligence on Intellectual Property Rights and legislations. Intellectual property refers to the legal rights granted to individuals or organizations for their inventions, creations, or innovations. AI presents unique challenges to IPR because it involves the use of data, algorithms, and models to create innovative solutions. The key concern is determining who owns the intellectual property rights when AI systems generate new inventions or works. In many cases, AI systems are trained on large datasets and learn from existing copyrighted material, which can complicate the issue of ownership.

Evolution of Artificial Intelligence:

The evolution of the Artificial Intelligence system through the advancement in the technological sphere began in the 1940s after Alan Turing tried to determine if a machine can exhibit intelligent behavior indistinguishable from a human Later in 1956, the term "Artificial Intelligence" was coined in the Dartmouth Conference[1]. Increase in computational power and data availability led to a resurgence in AI research and shift towards algorithms that allow computers to learn from and make predictions based on data provided the pathway for machine learning. The explosion of data generation provided rich resources for training machine learning models.Neural networks with many layers (deep learning) achieved breakthroughs in image and speech recognition. All these advancements paved the stage for AI, which we encounter in our day to day life from Alexa to ChatGpt and from Voice activation to Self driving cars. Thus, Artificial Intelligence has become an intrinsic part of society. Based on their functionality, Artificial Intelligence can be classified into a) Narrow AI - AI systems designed to perform a specific task or a narrow range of tasks, b) General AI - Hypothetical AI systems

[1] Jaakkola, Hannu, et al. "Artificial intelligence yesterday, today and tomorrow." *2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)*. IEEE, 2019.

that possess the ability to perform any intellectual task that a human can do. They have generalized cognitive abilities, c) Superintelligent AI - AI systems that surpass human intelligence in all aspects, including creativity, general wisdom, and problem-solving. Although few of our existing laws address the issues associated with Narrow and General AI, they are not comprehensive in nature. It is also important to note that laws relating to the regulation of Superintelligent AI are also in its nascent phase. It is the right time to start deliberating on those issues and develop a well established legal framework to govern those matters.

From Artificial Intelligence to Artificial General Intelligence:

According to the definition given by WIPO, Artificial Intelligence is generally considered to be a discipline of computer science that is aimed at developing machines and systems that can carry out tasks considered to require human intelligence. Machine learning and deep learning are two subsets of AI. In recent years, with the development of new neural network techniques and hardware, AI is usually perceived as a synonym for "deep supervised machine learning[2]. An Artificial General Intelligence (AGI) would be a machine capable of understanding the world as well as any human, and with the same capacity to learn how to carry out a huge range of tasks[3]. This falls under the category of Super intelligent AI. Apart from its ability to carry out tasks like humans, they are also being developed to emulate the emotional component of a human being. Artificial General Intelligence is different from Generative AI in that AGI represents the ultimate ambition of creating machines with human-like general intelligence, while Generative AI has already made significant strides in specialized areas of creativity and content generation. The AGI has been explained by providing a comprehensive analysis of Deepmind's AlphaGO, one of the Artificial Intelligence systems that exhibited the properties of AGI.

Analyzing DeepMind's AlphaGO:

Deep-Mind program of Google[4] is created to explore the potential of Artificial Intelligence. They undertake an interdisciplinary approach by bringing together new ideas and advances in machine learning, neuroscience, engineering, mathematics, simulation and computing infrastructure, along with new ways of organizing scientific endeavors. Different AGI systems

[2] https://www.wipo.int/about-ip/en/artificial_intelligence/faq.html (last accessed 07th July 2024).
[3] Goertzel, Ben. *Artificial general intelligence*. Vol II Cassio Pennachin. New York: Springer, (2007).
[4] Hodson, Hal. "DeepMind and Google: the battle to control artificial intelligence." *The Economist, ISSN* (2019): 0013-0613.

such as AlphaGo[5] - artificial intelligence software which plays the game of GO, a strategic board game. AlphaGo played a 5 game tournament against Lee Sedol, legendary GO 9 dan rated player, in which the software comfortably defeated him by 4-1. What is to be noted from the entire tournament is the move 37 that the AGI AlphaGO made in game 2 against Lee Sedol. It was considered a move that had a 1 in 10,000 chance of being used. This pivotal and creative move helped AlphaGo win the game and upended centuries of traditional wisdom. This move not only surprised the GO analysts but also the developers of the AlphaGO. This aspect of the AGI emphasizes the capabilities, issues and dangers that are associated with the AGI, when emotional, cognitive and self recognition skills are included in their programming. The traditional understanding of the legal system and age old legal definitions which have been time tested are to be considered for revamp. The AlphaGO project proved that AI is capable of evolving beyond the imagination and instruction of human beings. If that is the case, then it is the ripe time to revisit the Intellectual property laws which are apt to address the technical and legal issues associated with them. Further, if needed, separate domains must be brought under IP laws to specifically address the issues of AGI. One important question that is required to be addressed is Whether Artificial General Intelligence, which acquires cognitive and emotional components of humans, should be treated as Natural person or Juridical person.

Intellectual Property Rights of an Artificial Intelligence Software:

When an Artificial Intelligence system acquires an emotional quotient into its software, it emulates the qualities and characteristics of a human. Emotional quotient (EQ) or emotional intelligence is the ability to identify, assess, and control the emotions of oneself, of others, and of groups, whereas, an intelligence quotient (IQ) is a score derived from one of several standardized tests designed to assess intelligence[6]. This leads to some important questions of whether the creation, invention of AI should be given the same intellectual property rights protection as that of a human, who will be held liable for the acts or omissions of the AI system, if such an act was not reasonably foreseen by the creator of such an AI and if the AI system develops feelings and emotions, should it also be given consideration. If Artificial General Intelligence enters the field of innovation, invention and creation, then it will become essential to decide whether such acts belong to the AGI or the person who developed it. In the latter case, there will not be much complication as the existing laws, with few changes to adapt to the

[5] Chen, Jim X. "The evolution of computing: AlphaGo." *Computing in Science & Engineering* 4-7 (2016).
[6] Beck, Megan, and Barry Libert. "The rise of AI makes emotional intelligence more important."15. *Harvard Business Review* 1-5 (2017).

dynamics, will be sufficient. However, if AGI invents a machine or if it involves in creating a beautiful artistic work or if it contributes in the field of poetry which is original and unique, then the sad reality is that there is no existing IPR law to address the issue. This is because traditional legal jurisprudence has only connected the concept of rights with human beings. Though those rights are now being extended to wildlife also, they are at their nascent stage. This is the situation in the case of Artificial General Intelligence. There is a need for change in the legal jurisprudence in the field of Intellectual property law to bring it in alignment with the Artificial Intelligence system.The definition and scope of rights must be widened without giving any room for disturbing the existing legal discipline. The impact of such changes in the intellectual property rights and other proprietary rights of human beings must also be considered.

WIPO Conversation on AI and IPR:

The World Intellectual Property Organisation has created a discussion forum by bringing together Member States and other stakeholders to discuss the impact of Al on IP, with a view to collectively formulating the questions that policymakers need to ask. WIPO's The Conversation on AI and IP[7] policy aims to provide a forum to advance the understanding of the IP issues involved particularly with respect to the emerging field of AGI. It has conducted eight sessions on the topic and has received several issues from the stakeholders, WIPO has also released draft issues[8] that need to be addressed while bringing any policy changes in the intellectual property law in the member countries. The eighth session of the WIPO[9] focused on the area of Generative AI or GenAI and it sought to provide a map for navigating the challenges brought to the copyright system by GenAI. The following are some of the key takeaways from the WIPO conversation:

a) AI as an Inventor and Creator: One of the most debated topics is whether AI can be recognized as an inventor or creator under current IP laws. Traditional IP frameworks typically require a human inventor or author, leading to discussions on whether and how these laws should be adapted to acknowledge AI contributions.

[7] https://www.wipo.int/about-ip/en/artificial_intelligence/policy_exhibition.html (Last accessed 10th July 2024).
[8] https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_3_ge_20/wipo_ip_ai_3_ge_20_inf_5.pdf (Last accessed 10th July 2023)
[9] https://www.wipo.int/about-ip/en/frontier_technologies/news/2023/news_0002.html (last accessed 10th July 2024)

b) Patentability of AI-Generated Inventions: Determining the criteria for patentability of inventions generated by AI is another significant area of discussion. This includes considerations around novelty, non-obviousness, and the level of human involvement required in the inventive process.

c) Copyright and AI-Generated Works: The question of copyright protection for AI-generated works is also crucial. Discussions focus on whether works created entirely by AI can be copyrighted and who would hold the rights—the developer of the AI, the user, or the AI itself.

d) Data and Training Sets: AI systems often require large datasets for training, raising questions about data ownership, access, and the use of copyrighted materials. There are ongoing debates on how to balance the protection of data with the need for innovation and development of AI technologies.

e) Impact on Existing IP Systems: The rapid advancement of AI is prompting a re-evaluation of existing IP systems. This includes examining how AI can be used to improve IP administration and enforcement, such as using AI for patent searches, trademark analysis, and identifying IP infringements.

f) Ethical and Societal Implications: Ethical considerations, including transparency, accountability, and bias in AI systems, are also part of the broader conversation. WIPO is exploring how these issues intersect with IP laws and what frameworks can ensure ethical AI development.

g) International Cooperation: Given the global nature of AI and IP, international cooperation and harmonization of policies are essential. WIPO is working to facilitate discussions and collaborations among member states to address these challenges collectively.

Thus, WIPO conversation on AI and IPR provided a comprehensive discussion to explore these issues in depth and gathered input from stakeholders, including governments, industry, academia, and civil society.

Intellectual Property legislation relating to AI in different countries:

Both developed and developing countries are facing the policy issue with the advent of the Artificial Intelligence system. The intellectual property law and other legal systems in the country are not able to address the specific issues brought out by AI. The Intellectual Property legislation of different countries particularly in the domains of patents, trademarks and copyright have considered Artificial Intelligence. The efforts of the countries towards addressing the pressing issue of AI and Intellectual Property rights are as follows:

a) In United States of America, USPTO published the resulting report, entitled "Public Views on Artificial Intelligence and Intellectual Property Policy[10]," which summarizes nearly 200 comments from various stakeholders. The Report was divided into two parts, the first covering responses with respect to patenting AI inventions and the second covering responses to the impact of AI on IP policy areas other than patent law (including copyright, trademark, database protection and trade secret law). The current trend in the USA is that AI-related inventions are patentable provided that they meet the eligibility criteria and they must demonstrate a technical contribution which involves showing how the AI technology is applied to solve a particular technical problem in a novel and non-obvious way. In respect of copyright, The U.S. Copyright Office maintains that works generated autonomously by AI without human authorship are not eligible for copyright protection. Copyright protection is granted only to works created by a human author. Similar efforts have been taken in the areas of trademark, trade secrets and others. However, the USA has brought a 'National AI initiative'[11] which aims to promote AI innovation while considering the implications for IP law. This initiative includes efforts to ensure that IP laws effectively protect and incentivize AI-related innovations.

b) The United Kingdom has been actively considering the implications of artificial intelligence (AI) on its intellectual property (IP) laws. UK's "National AI strategy"[12],is one such initiative to bring AI into the Intellectual property rights regime. The UK

[10] Dwivedi, Yogesh K., et al. "Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy." *International Journal of Information Management* 57 (2021).
[11] Girasa, Rosario, and Rosario Girasa. "International initiatives in AI." Artificial Intelligence as a Disruptive Technology: Economic Transformation and Government Regulation (2020): 255-298.
[12] Salo-Pöntinen, Henrikki, and Pertti Saariluoma. "Reflections on the human role in AI policy formulations: how do national AI strategies view people?."Vol II *Discover Artificial Intelligence* 3 (2022).

Intellectual Property Office (UKIPO) follows guidelines similar to those of the European Patent Office (EPO). For AI-related inventions to be patentable, they must contribute to a technical field and provide a technical solution to a technical problem.Traditionally, UK copyright law requires works to be created by a human author to qualify for protection. This requirement poses challenges for purely AI-generated works. The UK is actively exploring how to address the issue of AI-generated works. There have been discussions about whether copyright law should be amended to include works created by AI with minimal human intervention. The UKIPO conducted a public consultation on AI and IP in 2020[13], seeking input on how AI-generated works should be treated under copyright law. The consultation indicated a general consensus for maintaining the human authorship requirement but also highlighted the need for further exploration.The UK actively participates in international forums, including the World Intellectual Property Organization (WIPO), to contribute to the global discussion on AI and IP.

c) Japan's attempt in bringing changes in the IP law to incorporate AI based intellectual developments. Japan is a pioneer in the field of Artificial Intelligence as well as Artificial General Intelligence. So it becomes extremely necessary for them to address the issue. Japan has taken the same stand as that of the USA and UK, wherein they have comprehensive guidelines for AI related inventions. Japanese copyright law, similar to many other jurisdictions, traditionally requires human authorship for a work to be eligible for copyright protection. This poses a significant challenge for AI-generated works, where the role of the human creator can be minimal or even non-existent. However, the Japanese government has been proactive in fostering an environment conducive to AI innovation while ensuring adequate IP protection. The "AI Technology Strategy"[14] which outlines Japan's vision for AI development, focusing on promoting research and development, establishing ethical guidelines, and enhancing international collaboration and the "Intellectual Property Strategic Program" includes specific measures to address the IP challenges posed by AI. These measures include updating patent examination guidelines, exploring new forms of IP protection for AI-generated works, and enhancing the enforcement of trade secret protections. They are key policy

[13] *Supra* note 11.
[14] Satofuka, Fumihiko, and Katsuhiko Nakamura. "AI: A strategic technology in Japan?." *AI & SOCIETY* 4 (1990): 154-160.

initiatives aimed at promoting AI development and addressing the IP challenges associated with AI.

Similar legislation is seen in different jurisdictions like the European Union, China, Australia and India. Each country's approach reflects its broader legal and policy priorities, and international harmonization of AI-related IP laws remains a significant challenge. Discussions and developments in WIPO and other international forums will likely influence future changes in national IP laws concerning AI.

Efforts taken by India to address the legislative lacunae in field of AI and IPR:

India has been making significant strides in the realms of intellectual property (IP) and artificial intelligence (AI). Initial steps in addressing the legislative lacunae were attempted by the Indian judiciary. In 2014, in the case Telefonaktiebolaget LM Ericsson vs. Intex Technologies (India) Ltd.,[15] Ericsson sued Intex for patent infringement, asserting that Intex had used Ericsson's Standard Essential Patents (SEPs) related to telecom standards, which included AI algorithms for improved communication protocols. The Delhi High court granted an interim injunction against Intex and set a precedent for the enforcement of SEPs in India, including those involving AI technologies. This indicates that the AI driven tasks are liable to be injuncted which indirectly considers AI as a legal person. However, in 2015 in Mitsubishi Electric Corporation vs. Controller of Patents[16], a patent application was rejected by Mitsubishi Electric Corporation for an invention related to a method for controlling an electric machine using AI. The Indian Patent Office rejected the application on the grounds of non-patentable subject matter under Section 3(k) of the Indian Patents Act, which excludes mathematical or business methods or algorithms from patentability. These contradictory stand brought the intervention of the legislature which has taken the following measures:

a) In 2018, NITI Aayog released a discussion paper outlining the National Strategy for AI[17], which included recommendations for improving the IP regime to foster AI innovation.The strategy emphasized the need for a robust IP framework to support AI

[15]Telefonaktiebolaget LM Ericsson vs. Intex Technologies (India) Ltd. CS(OS) No. 1045 of 2014.
[16] Mitsubishi Electric Corporation v. Controller of Patents, 2013 (55) PTC 382 (IPAB)
[17] Sinha, Amber, Elonnai Hickok, and Arindrajit Basu. "AI in India: A policy agenda." *The Centre for Internet & Society* 5 (2018).

research and development, and highlighted the importance of addressing IP challenges specific to AI technologies.

b) Later in 2020, The Department for Promotion of Industry and Internal Trade (DPIIT) sought public consultation on various aspects of AI and IP to understand the challenges and gather suggestions for policy formulation. The feedback from stakeholders was intended to shape future policy decisions and amendments to IP laws to better accommodate AI inventions. Also the Cell for IPR Promotion and Management (CIPAM) under DPIIT has been actively working to raise awareness about IP issues related to AI. They have conducted workshops, webinars, and published reports to educate stakeholders on the importance of protecting AI innovations.

c) Then, India's "Report 161: Review of the Intellectual Property Rights Regime in India" was presented by the Parliamentary standing committee in 2021[18]. This report would address various aspects of how AI intersects with IP laws in India. The committee has provided a report on the status of IP laws and AI along with the recommendation to address the issue. The report states that The Indian Patents Act, 1970 as well as the Copyright Act, 1957 are not well equipped to facilitate inventorship, authorship and ownership by Artificial Intelligence. The Committee notes that the relevance and utility of cutting edge technologies such as Artificial Intelligence (AI) and machine learning would increase manifold in the present world. In view of this, the Committee recommends that a separate category of rights for AI and AI related inventions and solutions should be created for their protection as IPRs. It further recommends that the Department should make efforts in reviewing the existing legislations of The Patents Act, 1970 and Copyright Act, 1957 to incorporate the emerging technologies of AI and AI related inventions in their ambit. It also recommends the Department that the approach in linking the mathematical methods or algorithms to a tangible technical device or a practical application should be adopted in India for facilitating their patents as being done in E.U. and U.S. Hence, the conversion of mathematical methods and algorithms to a process in this way would make it easier to protect them as patents. However to this report, the Ministry of Commerce in 2024 [19]replied that India being a member of all major international conventions and agreements for the protection of

[18] Parliamentary Standing Committee on Commerce , *Review of the Intellectual Property Rights Regime in India* (Report 161, 2021).
[19] https://pib.gov.in/PressReleasePage.aspx?PRID=2004715 (last accessed 15th July, 2024)

Intellectual Property Rights grants adequate protection of rights for works created by legal persons through Copyright Law and protects inventions through the Patent system. Therefore, there is no requirement to create a separate category of rights for AIand related innovations in the Indian IPR Regime. Therefore, while Artificial Intelligence (AI) and related innovations is an evolving stream of technology the current legal framework under the Patent and Copyright Act is well-equipped to protect Artificial Intelligence generated works and related innovations. Thus, indicating that AI generated or AI related work will be considered for Patent and copyright in India.

Thus, India's efforts in addressing AI and IP through case law, policy initiatives, and stakeholder engagement demonstrate a proactive approach to fostering innovation while protecting intellectual property rights.

Way Forward in addressing the AI problem:

With the continuous phase of development in the field of Artificial Intelligence from Narrow AI to Artificial General Intelligence, the hardware device with long hard wired room sized computers developed by Charles Babbage is now entering into the era of nanotechnology based neural networks. The impact of this development has entered the field of law and legal system. Hypothetically, if an AI develops a patentable product or if it writes a new book or poem which is unique, for which it is not programmed for, then can it claim IP rights over that? In the similar situation who will be held liable in case of infringement - the inventor/author or the AI? In the analysis, AlphaGO made a move beyond the perception of its inventors. How far will the inventor be held liable and should the scope of reasonable foreseeing be increased? Firstly, To address all these complexities, the traditional jurisprudence must undergo a paradigm shift to create an inclusive model. Secondly, The definition of a legal person to include AI must be brought in. Thirdly, as the IP law has a cross jurisdictional impact, it is better for the nations and WIPO to come up with a uniform and universal mechanism. Finally, the law should consider both the inventor/author and the beneficiaries/victims of the AI product

Conclusion:

In conclusion, the intersection of AI and IP law presents both opportunities and challenges in today's rapidly evolving technological landscape. AI has the potential to revolutionize various industries by enhancing productivity, driving innovation, and creating new forms of artistic

expression. However, it also raises complex legal issues surrounding intellectual property rights. To navigate these complex issues, it is crucial for lawmakers, legal experts, and AI developers to collaborate and create a robust framework that strikes a balance between incentivizing innovation, protecting IP rights, and fostering the responsible and ethical use of AI. Based on topics discussed, issues brought out and analysis made, few suggestions are made in order to develop a comprehensive mechanism, which will provide an effective solution to address key issues and thereby bring in AI compliant IP laws and standards in the world. This will be helpful for the policy makers and the researchers in understanding the limits and extent of the IP regime. The need for bringing changes in the laws of science, in order to make it adaptive to technological development and also to societal dynamics, is expressed with sufficient substantiation. The ethical aspects that need to be kept in mind while developing an Artificial Intelligence System or while making a policy are also deliberated.