RELEVANCE OF THE TECHNICALITIES OF ARTIFICIAL INTELLIGENCE TO INTELLECTUAL PROPERTY: AN ANALYSIS

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Abstract:

The intersection of Artificial Intelligence and Intellectual Property is the contemporary development which is encompassing various legal quandaries over the relevance of existing systems to the Artificial Intelligence developments. Primarily there are concerns about the ownership, liability as well as the validity of the Artificial Intelligence generated works in terms of high degree of requirements in some intellectual properties like copyrights, patents. There is a need to understand the technical components of the Artificial Intelligence which are the foundations for the arguments for or against the relevance of intellectual property protection. Therefore, the main aim of this paper is provide a cursory glance over the foundational issues pertaining to the relevance of the technicalities of Artificial Intelligence to intellectual property.

Keywords: *Artificial Intelligence, Intellectual Property, Copyright, Patent*

1. Introduction

Intellectual Property is a kind of property which is granted for the creations or inventions employing certain amount creativity and novelty. The traditional methods of the generation of the intellectual creations are the result of human ingenuity, where humans employ their thought process and creativity for creation of art work, or employ inventiveness to make inventions by adopting different tactics and scientific methods. Thus, the world has seen greater number of conventional inventions eligible for patenting such as steam engine, telephone, etc., to advanced inventions involving digital technologies, pharmaceuticals, inventions pertaining to space, etc., and on the other hand creative aspects of copyrightable subject matter like literary works in the form of printed material like books, images, poems, drawings, artistic works which have now been transformed as digital works employing same and in various cases, advanced levels of creativity. Such a development has always been supplemented by the involvement of technology. Technologies such as Artificial Intelligence have catalysed the increase in

intellectual property developments. Artificial Intelligence has transformed the way humans conduct and operate their businesses and other activities. The core constituents as discussed above in this chapter like algorithms, data, neural networks, machine learning models, natural language processing techniques, etc., have lot of bearing on the intellectual property rights[1] and are going to be central to the significance of creative and innovative endeavours and also equally raising concerns regarding ownership and liability issues.

2. Technical Aspects of Artificial Intelligence & Intellectual Property

The working of algorithms as a set of rules and instructions regarding the functioning of the Artificial Intelligence systems have the potentiality to process large amounts of information and data by pattern analysis, processing and generation of outcomes in the way of creative art works and inventions. These can be eligible for protection as copyrights and patents respectively where Generative Adversarial Networks supported by algorithms can be influential for the creation of literary or artistic works as well as music and sound recordings which are copyrightable subject matter and can also generate design of any product with functionality which can be falling under the subject matter of patentability. In these circumstances, there arises a potential conundrum as to the devolution of these rights and liabilities on the humans or the Artificial Intelligence. It has to be understood that the Artificial Intelligent systems which are being discussed are advanced in nature rather than the basic Artificial Intelligence run on general algorithms.

As it can be seen that the role of the Data in Artificial Intelligence is substantial as it is the fuel for the running and functioning efficiently. The Big data and large data sets that are adopted for the training of Artificial Intelligence models are increasingly becoming efficient by the continuous usage where the systems acquire self-training awareness. If we take the example of drug analysis where various combinations have to be ascertained, then there is a requirement of big data which consists of information pertaining to various drugs, their chemical components, biological constituents and physiological functionality, etc., aspects. All these can be utilized as the data for the training of Artificial Intelligence which would further provide with the possible drug formulation or drug combination for the treatment, diagnosis, or any other pharmaceutical and medical processes.[2] These all can be falling under the patentable protection. On the other hand, there can be certain circumstances where the intellectual property issues can arise is not only about the ownership and liability from the perspectives of the Artificial Intelligence but the usage of copyright protected data or data sets where traditional rights like licensing, selling, etc., rights as well as ethical usage of the data can be in the fore front challenging the legal validity of the output generated by the Artificial Intelligence.

[1] WIPO, *WIPO Technology Trends 2019 Artificial Intelligence*, (World Intellectual Property Organization, 2019) 72

[2] Lalitkumar K Vora, Amol D Gholap, 'Artificial Intelligence in Pharmaceutical Technology and Drug Delivery Design' (2023) 15(7) PHARMACEUTICS 1, 4

The computing advancements that have taken place in the past few decades have made humans to alter their perspectives and skyrocketed the development of the Artificial Intelligence expertise. The human thought processes integration into technology has been primarily reinforced by computational operation of the systems which have enabled the Artificial Intelligence to enhance its learning, understanding, decision making, problem solving abilities which are the main cognitive abilities required for the generation of creations and inventions eligible for the protection and recognition of intellectual property. Generative Artificial Intelligences, and interactive Artificial Intelligences have shaped the views to rethink on the applicability of intellectual property to technologies.[3] Watson, an Artificial Intelligence is famous globally for its advanced features developed by IBM and other such technologies can be upgraded with computational abilities to assist in researching various legal aspects, suggest strategies for business growth and expansion, formulate drug combinations or devise new inventions, etc. Such an ability for a liberal application of these technologies also require an acceptance from the legal community where primarily the traditional concepts of ownership, authorship, liability fixation can be widened to accommodate Artificial Intelligence and technological advancements within the domains of legal sphere as computing with cognition is growing and would become a reality where machines can really think with the help of technological revolution.

Neural networks have been ultimately the game changer in the fields of development of Artificial Intelligence as it provided the scope for the generation of novel mechanisms in handling and propagating the application and transformed the vision towards Artificial Intelligence as a mere assist tool to a mechanism which can possess thinking capabilities with cognitive attributes just like humans. Neural networks have the quality which replicates the aspects of human biological brain through the neurons structure extended to technological application in the form of nodes. The deep learning aspect affixed by the neural networks lets the Artificial Intelligence to process its data and information as well as contribute to the interactive nature which is considered a unique trait of humans now applicable to machines. These enable the machine intelligence to generate and create new works, outputs, innovations which are considerably creative and novel in nature like composition of music, creation of images, writing of poems, novels, etc., development and conception of inventions, process generation for the functioning of any device or formulation of pharmaceuticals, etc. These all functions, if done by humans, provide them the rights under intellectual property, but though with minimal human interference, the technologies are able to generate the output, it is currently far from being recognized as a protectable work. Best illustrations could be the conception of Generative Pre-Trained Transformers such as ChatGPT models and versions developed by OpenAI, Bing's Co-pilot, etc., which have neural networks technology inherent within their existence in a technological form. These generative models, have close to reality, human like interactions and response generation in the forms of texts, or any other visible representation in the form of documents, images, etc. The conventional application of intellectual property is not so favourable for recognizing its creativity and innovation as the

[3] Gil Appel, Juliana Neelbauer, et.al., 'Generative AI Has an Intellectual Property Problem' (*HBR*, 7 April 2024) <https://hbr.org/2023/04/generative-ai-has-an-intellectual-property-problem> accessed 18 January 2025

laws are human centred in its applicability where humans can only possess intellectual property rights such as patents and copyrights specifically.

Similarly, the basis for all these things to take place is the Machine Learning process for the development of Artificial Intelligence. The machine learning procedure enables the Artificial Intelligence mechanism to develop its ability to learn and comprehend various data and information with the help of learning algorithms. In the next step, it can process the information and analyse and apply the understanding to the given situation and circumstance through data analytics and thereby result for the development of new innovations and creations. With the adoption various learning techniques like supervised and unsupervised, reinforcement, semi-supervised, etc., learning algorithms, the Artificial Intelligence technologies are closing toward the intellectual property realm, as they are advancing than the humans would have ever expected, though humans are possibly at the centre of the creation of these technologies. On the other hand, parallelly, machine learning techniques are already adopted to analyse various patent databases, where the data and information can be analysed as to the inventiveness and obviousness of the conceived inventions during patent search processes.[4] It can also be used for proposing subtle variations in the inventions so as to be patentable. Machine learning techniques can be utilised to train and let the Artificial Intelligence learn to access the relevant available information and provide for the potential spheres for developing the inventions and also suggest for possible creation of art work eligible for copyright protection. But this can counter the traditional notions of intellectual property has human creativeness or the innovative ingenuity is central to intellectual property recognition which raises another crucial debate for the protection of Artificial Intelligence generated works and inventions independent of human involvement and assistance. This can lead to advancement of machine learning techniques where the Artificial Intelligence can develop its own learning curve, generate self-awareness and understanding so as to apply the analysis that has been sourced during the learning procedure for the conception and development of new creations and innovations which can have real-time application and offer solutions to the problems faced.

These kinds of developments challenge the existing intellectual property regime where the cognitive abilities of the Artificial Intelligence systems are further advanced by machine learning and deep learning mechanisms. In addition to the above developments, the Natural Language processing methods have been vastly influencing the development of Artificial Intelligence capable of holding intellectual property rights. The natural language processing technology lets the Artificial Intelligence to create artworks and invent products with the help of its linguistic abilities. These abilities are useful in processing information and data with natural touch of communication so as to apply the human abilities with technological creativity and innovation. The growth of Artificial Intelligence technologies with natural language processing like interactive Artificial Intelligence such as ChatGPT, Gemini, etc., have laid

[4] Xlscout, 'How AI-Powered Patent Search is Disrupting Patent Search Process' (*xlscout*, 13 March 2023) <https://xlscout.ai/how-ai-powered-patent-search-is-disrupting-patent-search-process/> accessed 20 January 2025

down path for the development in the fields of technological revolution which can generate intellectual property and also while communicating can violate certain rights and be susceptible for facing the liabilities. The blurring of the creative output is strengthened as it can be observed that there is a great amount of difficulty in differentiating the content generated by Artificial Intelligence from that of a human, though there is a process of mechanical adoption of language and communication.[5] It is not far from the future that the communication and language processing in a natural way like humans can be possible with more precision, clarity as well as the humanness inherent within the generated outcome so as to be eligible of copyright or patent protection. If in case, the Artificial Intelligence has crossed its limitations, in terms of generating creations and inventions through the language and communication modalities, in such cases the liability needs to be assessed with regard to its involvement in the creative process.

3. Interface of Artificial Intelligence & Intellectual Property

The interface between Artificial Intelligence and Intellectual Property Rights have provided the global legal mechanisms with novel challenges and opportunities to redefine the conventional regulatory and protective instruments to take a liberal and progressive approach. The burgeoning issues that surround around the intersection between the Artificial Intelligence and Intellectual Property is related to the authorship and ownership as well as the liability conundrum. As the technology is progressing faster, the skill of the Artificial Intelligence to develop content autonomously with minimal human interference requires the global legal systems to re-evaluate the subject matters creation and ownership. Though there are many countries which have regulations towards the status of computer generated works, but they are not in reality as advanced so as to deal with Artificial Intelligence. The creation of content by advanced Artificial Intelligent systems like General Artificial Intelligence or Super Intelligent Artificial Intelligence are not far from the future. Already there are certain intelligent Artificial Intelligences like DALL-E which has the advanced capabilities where it can generate high quality images on the basis of textual prompts in the form of input. The patentability criteria for the grant of patents such as novelty, non-obviousness and industrial utility also are challenged to its core due to the involvement of a non-human machine intelligence in the process of the innovation. The inventorship criteria in most of the countries tend towards non recognition for Artificial Intelligence. The Artificial Intelligence systems which are advanced in nature like DABUS have already arrived and placing significant pressure on the Intellectual Property Offices for recognition. Programmes like AlphaCode have created a cutting edge technological development for the development and generation of codes and algorithms basing on vast amount of data, big data and data sets.[6]

[5] AIM Leaders Council, 'How do we differentiate between human-made and AI-generated content?' (*AIM Research*, 29 September 2023) <https://aimresearch.co/council-posts/council-post-how-do-we-differentiate-between-human-made-and-ai-generated-content> accessed 20 January 2025

[6] Yujia Li, David Choi, 'Competition-level code generation with AlphaCode' (2022) 378(6624) SCIENCE <https://www.science.org/doi/10.1126/science.abq1158> accessed 22 January 2025

As it can be observed that the reliance of data by Artificial Intelligence technologies also pose certain new paradigms toward the ownership of data and licensing issues regarding its use for the functioning of the technology. Data protection laws have emerged in various jurisdictions like European Union, India, etc., but more emphasis is required on the role of Artificial Intelligence as big data is playing a major role for the technology's massive growth. The above intersections are fuelled by another major foundational challenge which is the ethical and bias implications in Artificial Intelligence, where the data fed for the training purposes might arise. The fairness and diversity of the information available can tend to make Artificial Intelligence to think in a particular way which might be biased against a particular section of community or detrimental to the interests of the society. The creation and innovation process should be inclusive in manner so as to include the benefits to majority of the society and achieve greater public good.

Finally, the commercial interests of the Artificial Intelligence in the creative and innovative endeavours take the primal significance as the base of intellectual property legal systems globally. The main objective of intellectual property systems is to provide for rewards for the intellectuality a person has showcased which has on the other hand benefitted the society. To exploit the same, a legal recognition is necessary which can have the ability to accelerate the rate of innovations and creations with the onset of Artificial Intelligence. Though at the current point of legal analysis, Artificial Intelligence is merely a tool which can assist the humans for creating technological wonders. The human Artificial Intelligence collaboration has begun in the past few decades and progressing to achieve greater heights with the development of the thinking capabilities by the Artificial Intelligence.[7] The ownership and liability issues within the intellectual property systems and the Artificial Intelligence's status quo within the framework is largely based on the kinds of unprecedented level of technological advancement particularly with the onset of General Artificial Intelligence and Super Intelligent Artificial Intelligence which impacts the system's ability to develop and generate content eligible for the protection by intellectual property, specifically copyrights and patents.

4. Conclusion & Suggestions

As there are various types of advanced Artificial Intelligence systems like General Artificial Intelligence, Super Intelligent Artificial Intelligence systems, which are comparably strong systems in the parameters of learning and understanding data and information as well as the cognitive abilities, the legal landscape of intellectual property needs to evolve as these advanced systems can have the ability to independently and autonomously create art works or inventions or collaboratively develop them. These critical developments need a more enhanced understanding and positive approach from the legislators and judiciary which would benefit the society where traditional notions of creativity and inventiveness need to be evaluated. The intersection of Artificial Intelligence and Intellectual Property Rights provides for a futuristic

[7] Janna Anderson, Lee Rainie, 'Improvements ahead: How humans and AI might evolve together in the next decade' (*Pew Research Center*, 10 December 2018) <https://www.pewresearch.org/internet/2018/12/10/improvements-ahead-how-humans-and-ai-might-evolve-together-in-the-next-decade/> accessed 27 January 2025

implication in jurisprudence as the advancements are not going to halt. Therefore, specific regulations as the developments of Artificial Intelligence systems which have the capabilities to be used for creative outputs and novel inventions needs to be brought into existence so that there is curated progress. The technological development and intellectual property system should go hand in hand with specific guidelines governing the Artificial Intelligence inventions which might be eligible for patent protection as well as copyright eligible works which are generated by Artificial Intelligence. As the technology progresses, there would be widespread use of the Artificial Intelligence in various sectors and where there is innovation there is intellectual property, therefore at global level, organizations like World Intellectual Property Organization should be proactive in providing necessary guidance to its member countries so that all the countries develop the regulations and try to bring in a technological equilibrium.