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AI AND IPR: NAVIGATING THE NEW CHANGING LANDSCAPE OF INTELLECTUAL PROPERTY RIGHTS

AUTHORED BY - SANYA THAREJA[1]

ABSTRACT

Artificial Intelligence, which seemed to be a far fetched dream a few centuries ago has now emerged as one of the most transformative technologies of the 21st century. At the base of AI lies creation and innovation which is being utilized for the development of each and every sector under the sun and Intellectual Property Rights too will not remain an exception to the same. There are two methods through which AI will have an impact on the IPR sector, on the one hand, Artificial Intelligence can undoubtedly bring significant benefits to areas such as patent innovation, efficient sorting of inventions, and providing insights into existing patents similar to new ideas, on the other hand, it also poses a potential risk to the core essence of Intellectual Property Rights- Innovation and creativity. AI has the capacity to both enhance and challenge the fundamental principles of Intellectual Property, leading to a complex and nuanced relationship between AI and Innovation.

The research paper will provide an extensive analysis of how Artificial Intelligence (AI) affects Intellectual Property Rights (IPR). Additionally, the paper will explore the prospects of AI in Intellectual Property Rights, discussing potential developments and opportunities in this field.

***Keywords**: Artificial Intelligence, Intellectual Property Rights, Copyright Law, Patent Law, Machine Learning*

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I. INTRODUCTION

(A) MEANING

In today's world, artificial intelligence (AI) is not merely a fictional concept depicted in movies but a rapidly evolving reality. Over the years, people have become accustomed to the idea of computers playing a significant role in the workforce. However, the recent advancements in technology have introduced a groundbreaking transformation in the form of AI. The term was first propounded by John McCarthy in 1956 when he conducted the first academic conference on the subject. He exactly defined AI as *"making a machine behave in ways that would becalled intelligent if a human were so behaving." It includes machine learning, deep learning, neural pathways, BOTs, cognitive computing, and natural language processing*[2]*. In layman terms, the computer which we use to store files, process large amounts of data, perform mathematical calculations, make a statistical analysis, will have a mind of its own to automatically learn from its past behaviors which the humans have taught and be able to perform its functions in a faster and smarter way. The functioning of AI involves* reasoning, information, planning, learning, communication, perception, and the ability to move and manipulate objects. *In the present scenario, AI disruption is still in an incentive stage where new boundaries of potential are created every day with its quality of data that is being processed.*[3]

The Oxford Dictionary defines the same as, "The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."[4] In simple terms, the term encompasses a range of elements and classifications, with one significant classification being the distinction between "Strong AI" (which closely imitates human functions and performs multiple tasks) and "Weak AI" (which is limited to specific, narrow tasks).[5]

[2] Kathleen Paisley and Edna Sussman, *Artificial Intelligence Challenges and Opportunities for International arbitration, New York State Bar Association, https:// archive.nysba.org/DisputeResolutionLawyer/*
[3] Pooja Agarwal et al; *Artificial Intelligence*; Vol-2, Issue 6 Issn (2305-509X), INT'L JOURNAL OF CASE STUDIES, 3 pp. 07-14
[4] OXFORD, OXFORD ENGLISH DICTIONARY (Oxford University Press, 3rd ed., 2010)
[5] Chetan Kumar GN, Artificial Intelligence: Definition, Types, Examples, Technologies, MEDIUM (Jan. 25, 2021) https://medium.com/@chethankumargn/artificial-intelligence-definition-types-examples-technologies962ea75c7b9b

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(B) ORIGIN

The origins of AI can be traced back to the 1950s, when the first operational AI programs were developed for the Ferranti Mark, I machine at the University of Manchester.[6] In 1955, Allen Newell and Herbert A. Simon created the first AI program that proved mathematical theorems and discovered new proofs.[7] Following this, engineers made significant advancements in AI, leading to increased interest from the private sector and government.

The government recognized the potential of AI in fields such as language transcription, translation, and high throughput data processing [8]. The advantages of AI in these sectors were evident in terms of time efficiency, flexibility, lack of exhaustion, and continuous operational capability. Consequently, companies and factories began incorporating AI-assisted robots into their workforce, particularly in production and manufacturing units. This diversification of technological investments resulted in improved profitability for companies.

With the success witnessed in these sectors, the idea of integrating AI into all industries emerged, aiming to bring ease and efficiency to various sectors. Tech giants like Google and Microsoft were at the forefront of this initiative. However, as AI's involvement expanded, concerns and criticisms began to surface. The loss of human employment was a well-known disadvantage, but other issues, including arbitration problems, started to become apparent as well.

As the world becomes increasingly surrounded by AI, there are societal implications to consider. While the benefits of AI are evident, such as increased productivity and efficiency, there are potential downsides that need to be addressed. One of these concerns is the impact on human employment, as AI may lead to job displacement. Additionally, issues related to arbitration, such as decision-making processes and fairness, require careful consideration in an AI-driven society.

Overall, while AI has brought significant advancements and benefits, it is essential to carefully evaluate its impact on society and address any potential disadvantages to ensure a balanced and equitable integration of AI technology.

[6] Pooja Agarwal et al; *Artificial Intelligence*; Vol-2, Issue 6 Issn (2305-509X), INT'L JOURNAL OF CASE STUDIES, 3 pp. 07-14
[7] History of Java Intelligence, JavaTPoint, https://www.javatpoint.com/history-of-artificial-intelligence
[8] Rockwell Anyoha, History of Artificial Intelligence, Harvard University Graduate School of Arts and Sciences, https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/

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II. IP LAWS AND ARTIFICIAL INTELLIGENCE

There have been major advancements in the field of Artificial Intelligence ever since the Greek myths of antiquity came across the concept of robots and artificial humans. These developments also include the creation of Turing Test by Alan Turing in 1950 . In general parlance, the test is basically a mechanism to determine whether a computer can think intelligently like humans.[9] In retrospect, last 3 decades have been of great importance and significance in the field of AI.

In 1991, during the Persian Gulf war, U.S Military deployed an artificial intelligence namely, Dynamic Analysis and Replanning Tool, commonly abbreviated as DART,[10] to enhance and streamline the transportation of supplies or personnel and address various logistical challenges through optimization and scheduling. Further, in 2005, Stanley, the robot vehicle capable of navigating for itself, without any human present in the driving seat or remote controls, won the DAPRA great challenge after beating 20 other robot cars.[11] In 2017, SOPHIA, the humanoid robot was granted Saudi Arabian Citizenship, becoming the first robot to receive Legal Personhood in any country.[12]

All these advancements make one believe that Artificial Intelligence is booming around the world and is capable of so much more. In March, the Sony World Photography Awards declared the winner of their creative photo category, which featured a black-and-white image capturing the embrace between an older woman and a younger one, titled "PSEUDOMNESIA: The Electrician." The announcement hailed the photograph as "eerie" and drawing inspiration from the visual style of family portraits from the 1940s. However, Boris Eldagsen, the Berlin-based artist behind the image, declined the award. Contrary to expectations, he revealed that the image was not a traditional photograph but rather a creation generated through the creative input of DALL-E 2, an artificial intelligence image generator.[13]

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[9] "The Turing Test: The First 50 Years" edited by Michael D. Schoenebeck and Hector J. Levesque.
[10] *"AI Military Topics" (web). Association for the Advancement of Artificial Intelligence. Retrieved 2008-02-28*
[11] https://americanhistory.si.edu/collections/search/object/nmah_1377824 , National Museum of American History

12 *UNDP (November 22, 2017). "UNDP in Asia and the Pacific Appoints World's First Non-Human Innovation Champion". UNDP Asia and the Pacific (Press release). Archived from the original on July 9, 2018. Retrieved July 21, 2018.*
[13] https://www.scientificamerican.com/article/how-my-ai-image-won-a-major-photography-competition/

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In the recent case of Naruto v Slater[14], a San Francisco Court ruled that animals lack legal standing under the Copyright Act to sue for infringement[15]. The court, composed of Judges Carlos T. Bea, N. Randy Smith, and District Judge Eduardo C. Robreno, deliberated on whether a monkey could seek damages and injunctive relief for copyright infringement. They determined that animals, including the specific monkey in question and animals in general, do not have statutory standing under the Copyright Act, despite having constitutional standing under Article III of the United States Constitution.[16] The court emphasized that since the Copyright Act does not explicitly grant animals the ability to file copyright infringement lawsuits, Naruto, the monkey, cannot bring a lawsuit for copyright infringement.[17] As a result, a similar situation has emerged for AI systems, as they also lack copyright protection.

The next question that comes to the mind is that who will own the creations and innovations created by these Humanoid robots? Presently, there are no laws that govern the possession of IP rights (in India as well as abroad) and the current law only regards Humans as creators, and hence IP holders and Infringers.

(A) AI AND COPYRIGHT

Art generated by AI is gaining momentum in the present time, which is causing uncertainty and confusion within the Indian Copyright Act. This art is fabricated independently by artificial intelligence without any innovative input by the human mind. These creations fall under the category of "computer generated works" as defined by the Indian Copyright Act. The person seeking ownership of the copyrighted work must be author of the same as per Section 2(d) of the act. According to Section 2 (d) "author" means,- (vi) in relation to any literary, dramatic, musical, or artistic work which is computer generated, the person who causes the work to be created;"[18] The issue lies within the phrase "the person who causes the work to be created" in the definition. The proximity of a human or legal person to the work is crucial for them to be considered the cause of

[14] Naruto v Slater, No. 16- 15469, opinion dated 23-4-2018. https://blog.scconline.com/post/2018/04/26/animals-by-virtue-of-thefact-that-they-are-not-humans-lack-locus-standi-under-copyright-act-to-sue-for-copyright-infringement/
[15] Available at https://blog.scconline.com/post/2018/04/26/animals-by-virtue-of-the-fact-that-they-are-not-humans-lack-locusstandi-under-copyright-act-to-sue-for-copyright-infringement/.
[16] ibid
[17] ibid
[18] Copyright Act, 1957, sec. 2, cl. (d), (vi)

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its creation. In other words, the involvement of a human or legal entity in close association with the work is necessary according to this act.[19]

The sine qua non of Copyright is originality. It is not even pertinent that the work should involve a novel expression of that and all that is required from the work is an expression of originality which basically means that the work should not be copied and should be an independent creation of the author. Now, there are two doctrines that revolve around the test of originality of work and these doctrines are -:

1. *Sweat of the Brow Doctrine*
2. *Modicum of creativity*

On one hand, sweat of the brow doctrine states that an author can obtain a copyright by exercising simple diligence during creation of the work and substantial creativity or "Originality" is not an essential. This doctrine provides copyright protection on basis of the labour, skill and investment of capital put in by the creator instead of the originality.[20]

On the other hand, In ***Feist Publication Inc. v. Rural Telephone Service Co. Inc*** [21], the US Supreme Court ruled that for a work to be considered original, it must not only be independently created but must also display a "modicum of creativity." This decision emphasized the importance of creative originality and introduced a new test to safeguard creative works based on the minimum level of creativity involved. The doctrine states that originality exists in a work when enough intellectual creativity and judgment has been applied during its creation. While the standard of creativity does not need to be exceptionally high, there should be a minimum level of creativity present to qualify for copyright protection.

The Indian Courts follow "Modicum of creativity" approach and the landmark judgement in this regard is that of ***Eastern Book Company v. D.B. Modak*** [22], where the Supreme Court discarded the

[19] 'Mounting Artificial Intelligence: Where are we on the time line?' by Vaishali Singh, para.7. Available at https://blog.scconline.com/post/2018/06/07/mounting-artificial-intelligence-where-are-we-on-the-timeline/.
[20] *Hailshree Saksena, DOCTRINE OF "SWEAT OF THE BROW"* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1398303*)*
[21] Feist Publication Inc. v. Rural Telephone Service Co. Inc [499 US 340]
[22] *Eastern Book Company v. D.B. Modak, 2008 1 SCC 1*

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'Sweat of the Brow' doctrine and shifted to a '**Modicum of creativity'** approach as followed in the US. So, after a brief reading of this doctrine, it cannot be stated that AI is not capable of creating an original work. Thus, the art and work generated by these machines can easily pass the originality test, but does that mean, these machines should be granted ownership of copyrights and should also be treated as juristic or legal person. The question that persists is that who should be given ownership of such a work, the programmer creating AI, AI itself or is there a possibility of a third alternate i.e., a co-authorship of the creation.

- TO PROGRAMMER

The most followed practice across countries is to grant all copyright related rights to the programmer itself and the rationale behind this practice is that AI or its creation was facilitated by the programmer through his intellectual creativity. Thus, in its most rudimentary sense, the rights should rest with the programmer. This rule has been very well summarized in UK copyright law, section 9(3) of the Copyright, Designs and Patents Act (CDPA), which says that: "In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."[23]

- TO AI ITSELF

There is a common argument suggesting that AI should be granted sole copyright ownership when it autonomously produces original work using its computational intellect, independent of human involvement. However, there are two main reasons why this rule is not currently accepted.

Firstly, granting a machine sole ownership would essentially imply granting legal personality to AI, allowing it to exercise rights. Currently, no country recognizes such rights for machines. Secondly, it is widely established worldwide that copyright can only be granted to original works resulting from human creativity and intellect. Since AI is not human, it cannot possess the same rights as humans.

For instance, the United States Copyright Office has explicitly stated that it will "register an original

[23] Copyright, Designs and Patent Act 1988, sec. 3, cl. (3), UK Legislation

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work of authorship, provided that the work was created by a human being". This stance is reinforced by the case law of ***Feist Publications v Rural Telephone Service Company, Inc***.,[24] where the court emphasized that copyright protection is limited to the products of human intellectual labor and creative powers of the mind. In essence, only works originating from human intellect possess the potential for copyright protection.

- CO-AUTHORSHIP

In 2020, an application was registered with the copyright office to register AI (RAGHAV) as the sole owner of an artwork, but the same was rejected. However, copyright office granted registration on the second application where a natural person and an AI (again RAGHAV) were named as co-authors of another artwork. on the second application. The reason behind such an approval wasn't clear and it is presumed that such approval was granted by mistake as the copyrights office issued a withdrawal of the same registration withing an year from such approval. The current status of this proceeding is unclear, but as per status on website of the copyright office, status of this application is still "registered."[25]

This doesn't hold any precedent for future scenarios but makes one think whether it's possible to hold rights related to artwork in co-authorship. This scenario will not only provoke the legislature to recognize and enact the legal status of AI but will also create a positive environment for companies investing their time, money and resources in creation of such AI in the first place.

(B) AI AND PATENTS

The transformative nature of AI innovation presents one of the most significant challenges as it has the capacity to fundamentally alter the essence of innovation. The Indian Patent Act of 1970 outlines the requirements for identifying an inventor and determining who can file a patent application in India. These criteria are detailed in Section 2 and Section 6 of the Act. Section 6 specifically

[24] Feist Publications v Rural Telephone Service Company, Inc [499 US 340]
[25] EXCLUSIVE: INDIA RECOGNIZES AI AS CO-AUTHOR OF COPYRIGHTED ARTWORK https://www.managingip.com/article/2a5czmpwixyj23wyqct1c/exclusive-india-recognises-ai-as-co-author-of-copyrighted-artwork

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addresses the eligibility of individuals to apply for a patent[26], while Section 2(1)(s) defines the term "Person"[27] and Section 2(1)(y)[28] specifies individuals who are not considered the true and first inventor when filing a patent application. Furthermore, it is important to highlight that Section 2(1)(s) of the Indian Patent Act explicitly indicates that the individual or entity filing for a patent can be either a "natural person" or a "Government" organization.

In 2019, over a dozen countries, including the European Union, received two patent applications in which an AI system called DABUS [29] (Device for the Autonomous Bootstrapping of Unified Sentience) was listed as the sole inventor[30]. The applications were submitted by Dr. Stephen Thaler, who claimed the inventions were generated solely by DABUS without any human assistance. As a result, DABUS was named as the inventor in the patent applications, while Dr. Stephen Thaler was listed as the applicant. This concept of assigning inventorship to an AI machine presented new legal complexities and raised global concerns regarding intellectual property (IP) rights in relation to AI-generated patents.

In India, the Controller General of Patents recently raised objections to the patent application (202017019068) for an AI-generated invention known as DABUS. The examination report highlighted objections based on Section 2 and Section 6 of the Patents Act 1970. According to the report, the application failed to meet the formal and technical requirements outlined in these sections because DABUS is not recognized as a legal person. The objections raised by the Controller General of Patents in the examination report of Thaler's Indian patent application were centered around the fact that the application did not meet the formal and technical criteria specified in Section 2 and Section 6 of the Patents Act, 1970. This was primarily due to the non-recognition of DABUS as a legal person.[31] Several legal precedents, including the *V.B. Mohammed Ibrahim v. Alfred Schafranek*

[26] Patents Act, 1970, Section 6
[27] Patents Act, 1970, Sec. 2, cl. (1), (s)
[28] Patents Act, 1970, Sec. 2, cl. (1), (y)
[29] DABUS is an acronym short for Device for the Autonomous Bootstrapping of Unified Sentience. Yogini Bhasvar-Jog, Artificial Intelligence as an Inventor on Patents The Global Divide and the Path Forward, JD SUPRA (Dec. 22, 2021), https://www.jdsupra.com/legalnews/artificial-intellig ence-as-an-inventor-7892764/.
[30] Laura Butler, World First Patent Applications Filed for Inventions Generated Solely by Artificial Intelligence, UNIV. OF SURREY (Aug. 1, 2019), https://www.surrey.ac.uk/news/world-firstpatent-applications-filed-inventions-generated-solely-artificial-intelligence; Martin Coulter, Patent Agencies Challenged to Accept AI Inventor, FIN. TIMES (July 31, 2019), https://www.ft.com/content/ 9c114014-b373-11e9-bec9-fdcab53d6959.
[31] Demystifying Rights of AI Generated Inventions, https://www.livelaw.in/law-firms/law-firm-articles-/ai-generated-inventions-chatgpt-indian-patent-act-dabus-united-states-patent-trademark-office-european-patent-office-226394?infinitescroll=1

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case[32], supported this view. The court ruling in that case stated that neither a corporation nor a financing partner can be considered the sole inventor and emphasized that only a natural person who actively contributes their skill and knowledge to the innovation can legitimately claim inventorship.

While current international, Indian, and various national regulations clearly stipulate that the inventor must be a natural person, it is essential to consider the implications of this provision considering future social and economic conditions. It is crucial to examine whether this requirement aligns with the primary objective of the patent system, which is to disseminate inventions widely, make them beneficial to society through mandatory publication, and facilitate further technological advancements. Through the grant of exclusive rights for a limited duration, the patent system also creates economic interests for right holders. Given these factors, it becomes necessary to contemplate the potential consequences if AI-generated inventions are excluded from the scope of patent protection in the future.[33]

(C) AI AND TRADEMAK

The primary objective of trademark law is to safeguard the rights of individuals or entities involved in the manufacturing and sale of goods with unique trademarks. It aims to prevent fraudulent activities wherein other parties try to deceive consumers by passing off their goods as counterfeits. Over the years, trademark law has effectively fulfilled its purpose of protecting consumers and preserving the integrity of brands. However, the advent of new technologies has posed certain challenges to the fundamental principles of trademark law.

Traditionally, there have been limited disruptions or significant changes in brand suggestions and the process of purchasing products, allowing trademark law to operate smoothly. However, the emergence of disruptive technologies such as Artificial Intelligence, Internet of Things (IoT), Blockchain, and Data Analytics is poised to have an impact on the conventional practices of trademark law. While trademark law has successfully navigated through three revolutions, questions arise regarding its compatibility with the fourth revolution, namely AI.

[32] V.B. Mohammed Ibrahim v. Alfred Schafranek AIR 1960 Kant 173, AIR 1960 Mys 173
[33] See Stephanie Skaff et al., Artificial Intelligence Can' t Patent Inventions: So What?, IPWATCHDOG (July 13, 2020), https://www.ipwatchdog.com/2020/07/13/artificial-intelligence-cantpatent-inventions/id=123226/ [hereinafter So What?].

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Artificial Intelligence represents the next evolutionary phase in the market domain and consequently, in trademark law. Online retailers are increasingly utilizing AI-powered algorithms to provide personalized recommendations to buyers. These algorithms analyze vast amounts of data including search histories, preferences, purchasing behavior, and other intricate details. However, it is crucial to recognize that this extensive use of AI systems is rendering the core concept of trademarks obsolete. AI can potentially undermine customer autonomy in selecting products, as it manipulates and influences their choices. It is both intriguing and concerning to observe that although customers believe they are making independent decisions or exercising control over their choices, many are unaware of the limitations imposed on their options.

The market has experienced a proliferation of AI-assisted products such as Google Home, Amazon Echo, Apple Home Pod, and Samsung bots. These products have advanced in imitating human thoughts and preferences. However, it is important to consider the potential consequences of relying on these products to make real-life decisions. For instance, if an AI-based system is used to order a product and the algorithm selects the best option based on user data, who bears liability if the product turns out to be counterfeit or if there are discrepancies in quantity or quality? Are tech giants like Google and Amazon accountable for intellectual property infringements and exploiting the reputation of product manufacturers? Moreover, the fundamental elements of trademark law, such as likelihood of confusion and imperfect recollection, have not been adequately addressed in the application of AI. These concerns demand urgent answers to justify the convergence of AI and trademark law.

Another example of AI challenging trademarks is Amazon's "Amazon Dash Replenishment Service" (DRS)[34], which enables automatic ordering of supplies when they are running low. This system limits consumer choice by subconsciously eliminating the opportunity to try different brands. As the system evolves, it may even make brand choices independently. Additionally, AI chatbots used by shopping websites, such as H&M's "Kik" bot or eBay's "Shop bot," have the potential to influence consumer loyalty[35]. However, there is a risk of biased recommendations from these AI-based bots, as algorithmic systems can generate biased outputs. This raises the question of liability if a bot

[34] Amazon Alexa Team, Amazon Dash Replenihment, AMAZON DEVELOPERS (Jan. 26, 2021) https://developer.amazon.com/en-US/alexa/dash-services.
[35] PSFK, The Future of Retail, PSFK (Jan. 27, 2021) https://www.psfk.com/2018/04/chat-ai-shopping-assistantsconversational-commerce.htm

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suggests an infringing product and consumers act on that recommendation. It is crucial to ensure that AI bots refrain from making discriminatory suggestions and avoid favoring only the companies that pay the parent organization manufacturing the bot.

Although there is still a limited number of cases addressing the intersection of Artificial Intelligence and trademark liability, a few such cases have emerged in the past decade. A notable case in this context is the "*Lush v. Amazon*"[36] case. The dispute arose when Amazon bid on the keyword "Lush" from Google, which resulted in redirecting users to Amazon's platform when they searched for "lush" on Google. The infringement claim was strong because even when searching on Amazon's own website, the displayed results showed similar products but not the original "Lush" brand products. This clear case of infringement led the court to hold Amazon liable for trademark infringement.

This situation raises concerns as e-commerce platforms powered by AI algorithms play a significant role in brand manipulation. It is expected that courts worldwide will encounter similar cases. As Artificial Intelligence becomes the new consumer, the interpretation of trademark law principles such as "likelihood of confusion" and the "average consumer" will evolve. Courts will need to consider the implications and assess how technological advancements impact legal interpretations. While courts have traditionally focused on the unwary "consumer" as a reference point, soon they may need to consider the perspective of the "artificial consumer" in algorithmic contexts. This seems to be the most plausible way forward in addressing these issues.

III. IF AI OWNS IP

The issue of AI owning intellectual property (IP) raises several concerns regarding infringement. Firstly, if AI is considered the holder of IP rights, it would need to be treated as an individual in terms of infringement and enforcement. However, AI cannot be held legally accountable or enter into contracts on its own, making this approach impractical.

Secondly, accountability becomes a question when AI infringes on the rights of a third party. In cases of copyright, for example, if an AI copies the work of an author, proving access to the protected work may be easier due to the vast availability of content on the internet.

[36] 5Cosmetic Warriors and Lush v Amazon.co.uk and Amazon EU, [2014] EWHC 181 (Ch).

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Thirdly, the transparency of AI systems regarding their ownership of IP rights poses a challenge. If AI systems are protected as trade secrets, it hinders transparency and responsibility in decision-making processes. As society increasingly values transparency, this becomes an important consideration. Therefore, the crucial question is how to address transparency when machine learning involves multiple data sources, dynamic development, and opaque elements due to technological or legal reasons.

IV. CONCLUSION

The future of intellectual property rights (IPR) in the context of artificial intelligence (AI) is a complex and evolving landscape. AI technologies have the potential to revolutionize various aspects of IPR, including ownership, inventorship, copyright, patentability, enforcement, and ethical considerations. As AI continues to advance, it raises new questions and challenges that require careful examination and adaptation of existing frameworks. One of the key areas of concern is ownership and inventorship. Traditionally, IPR frameworks have recognized human inventors and creators. However, as AI systems become more autonomous and creative, the question arises as to whether AI should be recognized as the owner or inventor of works it generates. This challenges the existing legal standards and requires a reevaluation of the criteria for determining ownership and inventorship. In the realm of copyright, AI-generated works present unique challenges. Determining whether AI-generated content should be protected under copyright law and, if so, who should hold those rights can be complex. Clear guidelines are needed to address issues of attribution, protection, and exploitation of AI-generated works, ensuring a balance between incentivizing innovation and safeguarding the rights of creators.

Patent law is also impacted by AI advancements. AI can facilitate innovation by automating research, improving data analysis, and enhancing decision-making. However, the question of whether AI-generated inventions meet the requirements of inventive step, non-obviousness, and human involvement for patentability arises. Policymakers and legal experts need to address these challenges to ensure a fair and effective patent system that encourages innovation while upholding the principles of patentability. Enforcement and liability issues emerge when AI systems infringe upon IPR. Determining responsibility and accountability in cases of AI-generated infringements can be complex, especially when AI operates autonomously or with limited human intervention.

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Developing frameworks to address liability and enforcement in AI-related IPR infringement cases is essential to protect the rights of creators and ensure a fair and balanced system.

Ethical considerations are another crucial aspect. Bias, fairness, transparency, and accountability must be carefully addressed to ensure that AI technologies do not undermine the principles and goals of the IPR system. Striking the right balance between fostering innovation and protecting the interests of creators and society requires thoughtful deliberation and ethical guidelines. Regulatory frameworks must also adapt to the evolving landscape of AI and IPR. Existing laws and regulations may need to be updated or augmented to effectively address the challenges posed by AI. Policymakers, legal experts, and stakeholders should work collaboratively to anticipate and address the legal and regulatory gaps associated with AI and IPR.

In conclusion, the future of AI and IPR requires comprehensive examination and adaptation of existing frameworks. As AI technologies continue to advance, it is essential to strike a balance between encouraging innovation, protecting the rights of creators, and addressing ethical concerns. By anticipating and addressing the challenges posed by AI, we can ensure a fair and effective IPR system that fosters innovation while upholding the principles of intellectual property rights. On an ending note, renowned astrophysicist Stephan Hawking quoted, "*I believe there is no deep difference between what can be achieved by a biological brain and what can be achieved by a computer. It, therefore, follows that computers can, in theory, emulate human intelligence — and exceed it"*[37]

[37] *From a speech given by Hawking at the opening of the Leverhulme Centre of the Future of Intelligence, Cambridge, U.K., October 2016*