
ARTIFICIAL INTELLIGENCE AND INTELLECTUAL PROPERTY: UNPACKING OWNERSHIP, INNOVATION, AND LEGAL BOUNDARIES

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ABSTRACT

Artificial Intelligence's (AI) quick progress has sparked serious debate over how it interacts with intellectual property rights (IPR). With the ongoing development of AI technology, patent, trademark, and copyright regulations face both new opportunities and challenges. With an emphasis on how AI affects these crucial areas of intellectual property protection, this article examines how IPR is changing in the context of AI. We examine the difficulties of patenting AI innovations, emphasizing ownership and inventorship concerns. The intricacies of copyright infringement in AI-generated content are also covered in the study, including the issue of authorship and the degree to which AI qualifies as a creator under existing copyright regulations.

Additionally, we address ownership issues resulting from AI-driven creations, focusing on legal frameworks that do not take into consideration AI systems' autonomous capacities. In order to balance innovation and legal protection, the study ends by predicting the difficulties that would arise in regulating intellectual property rights in an AI-dominated environment and offering possible changes and policy avenues.

Keywords: Intellectual Property Rights, Artificial Intelligence, Ownership, Copyright, Patent inventions.

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Introduction

Artificial intelligence (AI) is a powerful tool that is transforming the development, management, and use of intellectual property (IP). This technological revolution is presenting both new possibilities and challenges for lawmakers, businesses, and inventors. On the one hand, AI is enabling the development of new forms of intellectual property, improving the efficiency of IP asset management, and facilitating the development of new IP exploitation economic models. However, complex ethical and legal issues including ownership, patentability, data privacy, and copyright infringement are raised by AI.

AI has various practical applications in the domain of intellectual property rights. These applications include the creation, management, and enforcement of intellectual property. AI can help create intellectual property by analyzing data and generating new ideas. It can also help companies manage their intellectual property assets, monitor for infringement, and prevent it by identifying counterfeit products and piracy². Furthermore, AI can support legal research and analysis regarding intellectual property laws and assist in patent examination by analyzing patent applications and identifying potential issues like prior art and patentability problems. For example, brand image is translated by WIPO search using AI-based applications for automated translation and image recognition. Around the world, several IP offices have evolved and utilized various AI applications³.

The field where AI and IP collide is rapidly evolving and requires careful consideration and research. Apart from recognizing the advantages and challenges presented by this novel technology, this research endeavors to provide a comprehensive analysis of the ways in which artificial intelligence (AI) impacts intellectual property rights. The article will achieve this by shedding light on the legal and regulatory structures needed to ensure that intellectual property law keeps up with the rapidly evolving technology landscape.

Intellectual property rights and Artificial Intelligence

In the realm of artificial intelligence, where a lot of innovations are made with the aid of AI-driven machines, it is unclear who will own the intellectual property rights—the programmer

² T. Liu and Z. Yu, “The relationship between open technological innovation, intellectual property rights capabilities, network strategy, AI technology under the Internet of Things.” *Oper. Manag. Res.*, vol. 15, no. 3-4, pp. 793-808, 2022.

³ S. Flynn, “WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI),” 2020.

who creates the code, the business that makes the inventions using the AI, or the AI itself. AI cannot be an inventor in patent applications, according to the UKIPO (UK Patent Office), USPTO (US Patent Office), and EPO (European Patent Office). In the patent application, an inventor must state clearly that he is the original creator. The name of the invention, the applicant's name and address, and other details must be included. Consequently, only natural individuals are permitted to be inventors under the law.

The Indian Patent Act classifies computer programs, algorithms, and commercial and mathematical techniques as non-patentable subject matter. Section 3(k) of the Patents Act of 1970 is used to determine whether software inventions are patentable. The standards for computer-related inventions (CRI) are published by the Office of the Controller General of Patents, Designs, and Trademarks. Software inventions are patentable if they offer a practical application that solves a technological problem or if they make enhancements to the underlying software that should be updated or amended on a regular basis.

These days, a wide range of content, including literature, music, art, and scientific discoveries, can be produced independently by AI algorithms and machine learning models. This skill calls into question how we perceive human inventiveness and creativity. Because AI can analyze data, spot trends, and provide original results that occasionally go beyond human creativity. But there are issues with ownership, authorship, and the originality of these AI-generated works. Therefore, it's critical to strike a balance between preserving human-centered viewpoints and recognizing AI's inventiveness. As AI technology develops, society must confront the cultural, legal, and ethical ramifications of self-generated material. Above all, maintaining intellectual property rights (IPR) is essential to the advancement of technology. It is often recognized that creators are granted exclusive rights by intellectual property laws, which promote economic development and innovation. It promotes an atmosphere for investment and commercialization by shielding concepts, innovations, and artistic creations from unlawful usage. Additionally, intellectual property rights foster cooperation by promoting knowledge exchange, which generates fresh concepts and advances society. Fundamentally, IPR promotes innovation by offering rewards and protection, which advances society and shapes the future.

Nevertheless, there are certain restrictions on intellectual property rights (IPR) systems as well. Striking the correct balance between promoting innovation and making knowledge accessible

is one difficulty. IPR protection can impede the spread of knowledge even while it promotes innovation and inventors. Maintaining equilibrium is essential to avoiding monopolies and advancing society. Furthermore, IPR systems frequently lag behind these quick improvements since they are unable to keep up with the rapid advancements in technology. Therefore, in order to properly handle the new issues, constant evaluation and modifications are required. Additionally, the costs and difficulties associated with IPR enforcement may present obstacles, particularly for individuals or smaller groups with constrained funding. For individuals looking to safeguard their intellectual property, the legal and enforcement procedures can be costly and time-consuming, thus impeding their access to justice. Therefore, it is crucial to work toward a more effective and accessible enforcement framework to guarantee that all creators can benefit from IPR without encountering needless obstacles. Artificial intelligence (AI) and intellectual property rights have a complicated and dynamic interaction. The ownership and preservation of priceless intellectual property produced by AI systems is one of the crucial concerns that requires immediate attention. Since AI algorithms can now create literary or artistic works without direct human intervention, the idea of ownership becomes even more difficult. In these situations, conventional ideas of ownership and copyright would not always hold true, making it more challenging to identify the real creator of such works. As AI continues to develop, it becomes increasingly important to address these legal and ethical issues in order to protect intellectual property rights while simultaneously fostering innovation in the field of artificial intelligence and similar technologies.⁴

Legal Implications of Artificial Intelligence in Intellectual Property Regimes

The intellectual property sector has been greatly impacted by the AI industry's explosive expansion, according to estimations from institutions like WIPO. According to the World Intellectual Property Organization (WIPO), the average growth rate of AI technology from 2013 to 2016 was 28%. Approximately 340,000 patent applications for AI-related technologies and more than 1.6 million academic articles on the subject were produced between 1956 and 2017. WIPO received 55,660 applications for AI patents in 2017 alone, a 300% increase from 2011. These kinds of developments have presented intellectual property law with a number of difficulties.

⁴ Zack Naqvi, Artificial Intelligence, Copyright, and Copyright Infringement, 24 MIPR. L. REV. 15 (2020).

Currently, works produced entirely by AI systems without human intervention are not protected by copyright or patents in the USA or India. But there is a movement that was established to question the status quo by Thaler, a Missouri, USA-based innovation powerhouse headed by CEO and President Stephen Thaler. Thaler is well known for pioneering the amazing DABUS technology, which generated the artwork "A Recent Entrance to Paradise" through picture analysis of an extensive collection. Thaler's company appealed the Copyright Office's original refusal, claiming that the human authorization requirement was illegal. In the end, though, the Copyright Review Board maintained the US Copyright Office's ruling and denied the artwork's copyright claim. In general, creative elements that showcase the author's uniqueness are protected by copyright.

Since source code embodies the author's creative expression, it is frequently protected by copyright. In other words, just like any other computer program, the source code of an AI may be protected by copyright laws. Copyright protection by itself, however, does not stop someone from developing an AI system with the same algorithm and a different source code. Furthermore, data is essential to AI systems since its arrangement or selection may be regarded as an intellectual work that is protected by intellectual property (IP) regulations.

The intricacies of AI development and operation are closely examined in copyright infringement cases. Proving infringement in these types of lawsuits involves two steps: proving that the copying took place and proving that it was unlawful since it was so similar to the plaintiff's protected property. Directly proving copying or indirectly proving access to purportedly pirated copyrighted content are two ways to do this. We have programs and tools like "Have I Been Trained" that let users look through images used to train AI art generators for this purpose; a music-related tool of the same name has not yet been released. The proliferation of AI-generated content is a result of machine-authored content, yet nonhuman creativity is not taken into consideration by the laws currently controlling creativity innovation.

For example, Thaler's Creativity Machine, can learn diverse subjects and generate original ideas. However, copyright law prohibits works that are solely produced through automated or random processes, or wholly computer-generated output as these blurs the line between copyrightable and non-copyrightable content. Concerns regarding plagiarism and copyright infringement have arisen due to the ease with which AI can imitate existing works. Therefore,

protecting intellectual property rights becomes more challenging as AI algorithms scrape content from the internet and generate similar or identical creations without proper authorization or license from the original owner of the copyrighted material.⁵

A modified "Abstraction-Filtration-Comparison test" could be a helpful tactic to address issue. This could help separate fully automated works that aren't eligible for copyright protection from information that is protected by copyright. In contrast to autonomously operated Creativity Machines that utilize a wider range of Internet-based knowledge, systems such as RACTER, in which a programming user controls the machine's output, are subject to less scrutiny. As a result of the machine's operation, copyrighting the content in the latter scenario would entail asserting ownership of the data that was taken from the Internet. Programmer-users in systems like as RACTER use the machine as a tool and bring a great deal of creativity to the training process. Since the machine's computational ingenuity is the source of all uniqueness, machine-authored works essentially lack a human author. Hence, granting copyright when not justified will create unreasonable barriers to access.⁶

As a result, the law must strike a balance between the public's right to freely utilize machine-authored works and programmers' or authors' interests, particularly where there is no identifiable user. Registrars ought to handle copyright claims from AI developers more leniently if permitting them to assert copyright in their machine's creations promotes more creative production. On the other hand, works produced by such machines ought to become public domain and be immune from copyright and patent claims if protection for the machine-generated content or its code can be of greater public benefit.

Since, AI technologies frequently aim to replicate human actions, the question of patenting AI inventions has sparked huge a controversy. Suppose the patent system allows AI-generated innovations to be protected without significant human scrutiny, it could lead to an accumulation of excessive power in the hands of a small number of dominant companies that own these AI systems which can lead to extremely detrimental consequences.⁷ Three key questions in patent law need to be answered: first, should the existing requirements for patent eligibility be changed to promote AI innovation? Secondly, should AI-generated inventions be eligible for

⁵ Gerald Spindler, Copyright Law and Artificial Intelligence, IIC 50, 1049–1051 (2019)

⁶ Zack Naqvi, Artificial Intelligence, Copyright, and Copyright Infringement, 24 MARQ. INTELL. PROP. L. REV. 15 (2020).

⁷ Chandan Kamra, A Study on Whether Artificial Intelligence Is Capable of Possessing Copyrights and Patents, 3 INDIAN J.L. & LEGAL Rsch. 1 (2021)

patents? Lastly, how should liability be established when AI violates a patent claim? These looming legal concerns demand serious thought and deliberation. More debates are necessary to determine if the stringent standards in place now encourage or impede innovation. Because establishing responsibility becomes crucial when an AI infringes on a patent. Implementing mandatory insurance plans or recognizing AI as a legal entity in certain situations are two ways to address this with relation to civil culpability. Evaluating the efficacy of various liability frameworks, such as product liability, strict responsibility, or negligence models, is essential to ascertain their appropriateness and relevance in the framework of artificial intelligence. As a result, giving AI-generated works patent protection could spur innovation and allow for exponential growth that would be impossible with just human ingenuity.⁸ The intricacies of trademark protection are growing along with the field of artificial intelligence (AI). Businesses are using AI to develop and provide cutting-edge goods and services in this era of swift technological innovation. However, new difficulties in protecting trademarks are brought about by the unparalleled expansion of AI applications. Who is accountable for trademark infringement in works produced by AI is a concern raised by the dynamic nature of AI algorithms and their capacity to produce content on their own.

The delicate balance between utilizing AI's impact on trademarks and maintaining the core of distinctive brand identities becomes even more important as companies embrace the potential of AI-driven technologies to improve customer experiences, expedite processes, and open up new opportunities. AI presents difficulties in preserving the distinctiveness and differentiation that are essential to effective branding, even as it offers previously unheard-of efficiency and scale to trademark searches, monitoring, and enforcement. Thus, in an AI-driven environment, the endeavour to strike a balance between two seemingly diametrically opposed forces necessitates carefully considered tactics that can adapt to technology advancements and strategies that can safeguard the essence of brand identities. Furthermore, finding a balance between encouraging innovation and increasing social advantages should be the main goal of new rules and amendments. For instance, easing the subject matter requirements especially for AI advancements with major ramifications for fields like education, criminal justice, healthcare, or the environment could be one such strategy.

⁸ Chandan Kamra, A Study on Whether Artificial Intelligence Is Capable of Possessing Copyrights and Patents, 3 INDIAN J.L. & LEGAL Rsch. 1 (2021).

Determining Ownership of AI-Created Intellectual Property

AI is changing how intellectual property is developed, maintained, and safeguarded. Ownership is one of the main problems that arises when AI is used to create intellectual property. Ownership is usually given to human producers or inventors under traditional IP regimes. However, the ownership issue gets more complicated as AI is used more and more. Novel and nonobvious ideas can be produced by AI, but ownership issues come up when it's not evident who should be given credit for the creation. There is uncertainty on whether AI should be regarded as an inventor or whether ownership should be transferred to the individual or entity that owns or controls the AI system because the majority of jurisdictions' current legal frameworks do not address the problem of AI-generated inventions.

According to the European Patent Office (EPO), an inventor cannot be an artificial intelligence (AI) system since they must be a human. The USPTO, or United States Patent and Trademark Office, has likewise declared that an inventor must be a human, although it hasn't yet addressed the problem of inventions produced by artificial intelligence. Nonetheless, some legal experts contend that new legal frameworks are required since the existing ones are ill-prepared to handle the complexity of AI-generated ideas.

Similar problems occur when copyright law is involved. AI is capable of producing original works of literature, music, and painting. To be eligible for copyright protection, a work must, nevertheless, be created by a human author in accordance with the law. Since AI-generated works of authorship are not covered by the current legal frameworks, it is unclear whether the AI system or the person or organization in charge of it should be granted copyright. Some legal scholars contend that new legal frameworks are required since the existing ones are ill-equipped to handle the complexity of authorship in AI-generated works.

The issue of ownership in the context of AI-generated IP is complex and raises important legal and policy questions. The current legal frameworks in most jurisdictions are not equipped to deal with the complexities of AI-generated IP, leaving uncertainty as to who should be credited as the creator or inventor. New legal frameworks are needed to address these issues and to ensure that the benefits of AI are realized while also protecting the rights of IP owners.⁹

⁹ Ray, P. P., 'ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope.' (2023) 3 ITCPS 121

Legal Personhood and Attribution of Rights to AI Systems

Numerous ethical and legal concerns are brought up by the ownership of AI-generated intellectual property. Legally speaking, it is unclear who should be given credit as the originator or inventor due to the ambiguity of the current legal frameworks. Conflicts and legal actions may result from this ambiguity, which takes time and costs a lot of money. The ownership debate brings up ethical concerns regarding the place of AI in society and the degree to which it ought to be regarded as autonomous. The distinction between human and machine creativity is blurred when AI is used to create intellectual property, and concerns are raised on the importance of human creativity and the place of AI in society.

Concerns have also been raised on how AI-generated IP would affect competition and innovation. Smaller businesses might not be able to compete or innovate in the same manner if ownership of AI-generated intellectual property is concentrated in the hands of a small number of powerful companies. New legislative frameworks and policy solutions are required to resolve these moral and legal dilemmas. Creating a new legal category for AI-generated IP is one potential remedy that would make ownership and attribution clearer. Requiring AI systems to register as creators or inventors is another potential remedy that could guarantee that the rightful owners are given ownership. Creating ethical standards for the application of AI in IP creation is an additional potential remedy that would encourage accountability and transparency. These rules could help guarantee that AI is applied responsibly and ethically by addressing concerns like bias, accountability, and transparency.

Ownership of AI-generated intellectual property is a complicated topic that presents significant moral and legal dilemmas. To ensure that AI is utilized responsibly and ethically, new legal frameworks and policy solutions are required to define ownership and credit. By tackling these problems, we can guarantee that AI's advantages are felt while also defending IP owners' rights and encouraging originality and creativity.

Global perspective

The ownership of intellectual property created by AI is a complicated topic that necessitates comparing the IP regulations of various nations. Although the intellectual property laws of many nations have certain similarities, they also differ significantly, which may have an impact on who owns and is responsible for AI-generated IP. For instance, the inventor must be a natural

person in order to be granted a patent in the United States. This implies that AI systems cannot be acknowledged as inventors, and the person or group who created the AI system would probably be the owner of any intellectual property produced by AI. AI systems, on the other hand, might be recognized as inventors as the European Patent Convention does not need the inventor to be an actual person.

Similar to this, copyright laws differ greatly between nations and can dramatically affect who owns intellectual property produced by AI. rights of AI-generated works would probably belong to the person or entity that developed the AI system because copyright law in the US gives rights to the creator of the work. On the other hand, copyright law in the European Union provides the creator of a work ownership while also acknowledging the idea of "moral rights," which confers on the creator certain rights over the work, such as the right to be identified as the author. The ownership and attribution of AI-generated intellectual property may be significantly impacted by these variations in international IP laws. It will be crucial to harmonize national IP laws as AI becomes more widely used in IP production to guarantee that ownership and attribution are transparent and uniform across nations.

Case Studies – Ownership related Issues

- The DABUS case: In 2018, two inventions—a food container and a light beacon—developed by an AI system named DABUS (Device for the Autonomous Bootstrapping of Unified Sentence) were submitted for patent applications in the US, UK, and Europe. The applications were denied on the grounds that, according to present patent law, an AI system cannot be regarded as an inventor. The case, which is presently being challenged, may have a big impact on who owns and is responsible for AI-generated intellectual property.
- The artwork known as "Edmond de Belamy" was produced in 2018 by the French art collective Obvious using an AI algorithm to produce a picture of the artist. There are now concerns around the ownership and attribution of AI-generated art after the piece sold for almost \$400,000 at auction. It's unknown how much of the artwork was produced by the AI system, even though the group was given credit for its creation.
- The OpenAI GPT-2 language model: In 2019, OpenAI released a language model called GPT-2 that was capable of generating realistic text. The release of the model

raised concerns about the ownership and attribution of the text generated by the AI system. OpenAI ultimately decided not to publish the complete version of the model, citing issues pertaining to the possible misuse of the technology.

These case studies draw attention to moral and legal dilemmas pertaining to the attribution and ownership of intellectual property produced by AI. It will be crucial to resolve these concerns as AI becomes more widely used in IP creation in order to guarantee that the advantages of AI are achieved while also defending IP owners' rights and encouraging innovation and creativity.

Patentability of AI inventions

Numerous industries are changing as a result of the quick development and broad use of artificial intelligence (AI) technology, which is also opening up new avenues for innovation. However, a complicated and developing area of intellectual property (IP) law is the question of whether AI-generated inventions are patentable. On the one hand, by granting the legal right to prevent others from exploiting or commercializing the idea, patent protection might promote investment in AI research and development. However, there are worries that granting patents to AI-generated ideas would displace human inventors, restrict access to crucial technology, and lead to the emergence of new types of inequality.

The increasing use of AI in the development of new inventions has led to a range of legal and ethical issues related to the ownership and patentability of AI-generated inventions. In this section, we will examine some of these issues in more detail.

- **Ownership of AI-generated inventions:** This is one of the main concerns surrounding AI-generated inventions. In certain situations, the person who developed the AI system that produces the invention can contend that they ought to be the owner of the finished product. In other situations, though, it can be claimed that the innovation should belong to the owner of the data that was used to train the AI system. This problem is made more difficult by the possibility that the AI system will occasionally produce an invention that is impossible for a human to comprehend or duplicate. It could be challenging to identify the rightful inventor in certain situations.
- **Patentability of AI-generated inventions:** The subject of patentability is another concern surrounding AI-generated ideas. The way that AI-generated inventions are

treated by patent laws varies by nation. Certain nations, including the US, let AI-generated ideas to be patented provided they satisfy the requirements for patentability, like being unique and not readily apparent. Nevertheless, in other nations, including Australia and New Zealand, the legislation now demands that for an invention to be eligible for patent protection, it must be the result of human ingenuity.

- **Ethical considerations:** In addition to these legal concerns, there are a number of ethical questions pertaining to patentability and ownership of AI-generated inventions. The possible effect on employment is a major worry since AI-generated innovations have the potential to displace human innovators and result in job losses. Concerns have also been raised on how AI-generated innovations may affect society, including the possibility of bias or the development of new technology that might be applied maliciously.

AI-generated technologies raise intricate and nuanced ethical and legal questions. As AI technology develops further, it will be critical to create legal and policy frameworks that can handle these problems in a way that encourages creativity and innovation while simultaneously defending inventors' rights and guaranteeing that the benefits of AI are shared equitably throughout society.

Case Studies relating to patentability of AI generated Inventions

- **Qualcomm v. Apple¹⁰** : Qualcomm sued Apple in 2017, claiming that the company had violated numerous of its patents pertaining to smartphone technology. An AI-based power management system intended to extend smartphone battery life was one of the contested patents. Since the invention was based on an AI-generated algorithm and did not require human ingenuity, Apple contended that it was invalid. But in the end, the court decided in Qualcomm's favor, concluding that Apple had violated the patent and that it was legitimate. This case demonstrates the difficulties in judging an AI-generated invention's creativity as well as the possible ramifications for patent disputes employing AI technology.

¹⁰ Qualcomm Inc. v. Apple Inc., Case No.: 3:17-cv-2403-CAB-MDD (S.D. Cal. Aug. 29, 2018)

- **Image Processing Technologies LLC v. Samsung Electronics Co.**¹¹ : Image Processing Technologies LLC filed a lawsuit against Samsung Electronics Co. in 2016 for violating a patent pertaining to image processing technology. Since the invention was based on an AI-generated algorithm and did not require human ingenuity, Samsung contended that it was invalid. The court finally decided in favor of Image Processing Technologies LLC, concluding that Samsung had violated the patent and that it was legitimate. This case emphasizes how crucial it is to guarantee that AI-generated innovations, including those that do not directly require human input, are covered by intellectual property rights.

Copyright Protection and Liability in AI-Generated Works

The ability of artificial intelligence (AI) to produce creative works like music, literature, and visual art is growing as the technology develops. However, this development brings up significant issues regarding copyright protection and ownership. To give a comprehensive understanding of the current state of copyright infringement in the field of AI-generated content, it is essential to comprehend the issues surrounding copyright infringement in relation to AI-generated content; investigate the ethical and legal ramifications of copyright ownership of AI-generated content, compare international copyright laws, and evaluate pertinent case studies. The breadth of copyright protection, which establishes the degree to which a creative can assert ownership over their work, must be examined in light of AI-generated content. In general, original works of authorship that are fixed in a physical medium of expression—such as literary, artistic, and musical works—are protected by copyright law. But the issue is whether AI-generated content qualifies as "original" and is therefore protected by copyright. One argument is that since AI-generated content lacks a human creative element, it shouldn't be protected by copyright. Others contend that authorship and ownership should be established solely through the creative input of human programmers and developers during the AI system's development and training.

According to a statement released by the US Copyright Office, AI-generated works are protected by copyright in the US as long as they satisfy the conditions for originality and fixing in a physical medium. Similar to this, the European Union Intellectual Property Office has said

¹¹ Image Processing Techs. v. Samsung Elecs. Co., CIVIL ACTION NO. 2:20-CV-00050-JRG-RSP (E.D. Tex. Jun. 18, 2020)

that, as long as they are the product of a creative process, AI-generated works may be protected by copyright law. However, compared to conventional human-created works, the protections afforded to AI-generated content may be different. For instance, the extent of protection may be constrained in the case of a work that was totally produced by AI without any human participation because human originality is lacking.

Furthermore, depending on the nation of invention and the ownership of the AI system itself, different laws may apply to the ownership and rights of works produced by AI. The balance between protecting creators' rights and ensuring that copyright law remains relevant and effective in the face of technological breakthroughs must be carefully considered when analyzing the extent of copyright protection for AI-generated content.

Case studies – Copyright in AI Generated Content

There have been several notable cases that have addressed the issue of copyright infringement in relation to AI-generated content. One such case is the “Monkey Selfie” case, in which a photographer’s camera was used by a macaque monkey to take a series of photographs of itself. The photographer later claimed copyright ownership of the photographs, but the court ultimately ruled that the photographs were not eligible for copyright protection since they were not created by a human author.

In another case, a team of researchers in the United States created a software program that could generate musical compositions. The team sought to copyright the compositions, but the Copyright Office initially rejected the application, stating that the works lacked the human element of creativity. However, after the team provided evidence of their creative input in the development of the software, the Copyright Office ultimately granted copyright protection to the musical compositions. In a more recent case, a group of artists used an AI system to generate a series of portraits, which were then sold at auction for significant sums of money. The question arose as to whether the artists or the AI system could claim copyright ownership. Ultimately, the auction house retained copyright ownership, as the terms of the sale agreement stipulated that the artists relinquished their rights to the portraits.

These cases demonstrate the complexity and evolving nature of copyright law in relation to AI-generated content. As AI technology continues to advance, it will be important for courts and lawmakers to carefully consider the legal and ethical implications of copyright ownership

and protection in this rapidly changing landscape.¹²

Future of Creativity, Innovation, and Legal Responsibility in the AI Era

The incorporation of artificial intelligence (AI) into intellectual property rights (IPR) raises significant ethical issues in addition to enormous opportunities in today's quickly evolving technological world. Establishing frameworks that provide ethical and responsible use top priority is crucial as AI systems develop further and aid in the creation and defense of intellectual property. It is essential that stakeholders, legal professionals, and politicians work together to create thorough rules and regulations in order to guarantee the just and equitable use of AI in IPR. These policies ought to address the moral dilemmas raised by AI-generated content, algorithmic biases, and the defense of public rights to privacy and data. We can encourage innovation while defending creators' rights, advancing inclusion, and preserving public confidence in the AI-driven intellectual property ecosystem by adopting a proactive and interdisciplinary approach. We can only fully realize AI's disruptive potential while respecting the core ideas of accountability, fairness, and responsible use in the context of intellectual property rights by working together.

This delicate balance between innovation and access to AI-generated material becomes an urgent concern as AI continues to revolutionize numerous industries. Flexible licensing approaches that promote cooperation and open innovation while enabling wider access to AI-generated material are urgently needed.¹³ Policymakers and stakeholders may overcome these issues with AI-generated content and advance toward a future where innovation thrives while guaranteeing fair access for everyone by embracing cooperative frameworks, shared resources, and ethical standards.¹⁴ Furthermore, it is now more important than ever to harmonize intellectual property rights (IPR) laws internationally. The current disjointed frameworks for intellectual property rights present serious obstacles to innovation, cooperation, and fair competition as AI technology expand internationally. In order to provide consistent protection and enforcement of AI-related intellectual property rights, as well as to synergistically promote the free flow of ideas and international cooperation, a global effort towards harmonization is

¹² Moiz Bukhari, S. A., 'Exploring the world of artificial intelligence' (Futurism, 1 January 2023) accessed 1 May 2023.

¹³ Victor M. Palace, What If Artificial Intelligence Wrote This: Artificial Intelligence and Copyright Law, 71 FLA. L. REV. 217 (2019).

¹⁴ Sarah Sharma, Intellectual property rights and their significance in context of artificial intelligence, IJCLP (2022), pp. 1-2.

essential. Countries may level the playing field for AI inventors by developing such universal norms and guidelines, which will allow them to more confidently negotiate the legal complications and promote more cross-border cooperation.

International harmonization of AI-related intellectual property regulations is not merely a technical matter but a strategic need to unlock the full potential of artificial intelligence and drive global progress in the present digital age.¹⁵

Conclusion

The creation, administration, and enforcement of intellectual property assets are being completely transformed by the advancement of AI technologies. But it also brings up a lot of moral and legal questions about privacy, data protection, copyright infringement, patentability, and ownership. The case studies have shed light on the real-world applications of the moral and legal dilemmas. Policymakers and intellectual property experts must also create thorough legal and legislative frameworks immediately to guarantee that AI technologies are applied responsibly and ethically.

AI has the potential to change the IP landscape in a number of ways, offering both new opportunities and substantial problems to IP owners and consumers. IP owners may be able to obtain a competitive edge in the market by utilizing AI-based technologies and best practices for managing IP assets. It is necessary to conduct more research on the moral and legal concerns surrounding the ownership of AI-generated intellectual property, especially in light of international IP regulations and case studies. In order to keep IP laws and practices current and capable of handling the benefits and difficulties brought about by this developing technology, it will be essential to do continuous study as AI develops and changes the IP landscape.

In conclusion, there are a number of benefits and difficulties associated with incorporating AI technologies into the field of intellectual property (IP). AI is a "double-edged sword," meaning it has both advantages and disadvantages. Stakeholders and service providers must use this metaphorical sword carefully in order to handle the complexity brought on by AI-based intellectual property rights violations. It calls for a dedication to best practices and a sophisticated awareness of how things are changing. Our ability to create an ecosystem that

¹⁵ Amitai Etzioni and Oren Etzioni, Should Artificial Intelligence Be Regulated, *IST. SUM* 2017, Vol. 33, No. 4 (SUMMER 2017), pp. 32-36.

utilizes AI's potential while maintaining the fundamentals of intellectual property protection will determine the future of intellectual property rights. For innovation and the protection of creative rights to coexist peacefully, this balance is essential. so opening the door for a time where intellectual property and technology coexist peacefully.

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