UCP Journal *of* Law & Legal Education
Vol. 3, Issue 1 (June - December 2024)

Generative Artificial Intelligence and Intellectual Property Rights: Impacts, Challenges, and Future Directions

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Abstract

In the world of technology, the rapid advancement of Artificial Intelligence (AI) technology has brought significant changes across various industries, including the domain of inventions and creative endeavours. However, the current IP legislative frameworks are lagging behind in the protection of AI-generated content and methods to differentiate between human-created and AI-generated content. This paper attempts to portray the impact of AI-generated content of IP laws protection to the creation of AI innovations, and how human creation and formation can be balanced against AI innovation. The paper also discusses the ethical implications and coverage issues that arise from the integration of AI into the field of intellectual property, offering insights into potential legal reforms. Through this thorough analysis, the paper aims to provide a nuanced understanding of the complex relationship between AI and IP rights, looking ahead to future legal tendencies and offering recommendations for lawmakers and practitioners. A comparative evaluation of global jurisprudence reveals the range in legal responses to these emerging challenges. AI's involvement is putting increasing strain on current IP laws, which favour human creativity and need for updated legislation. Fostering innovation while preserving legal clarity, equity, and ethical accountability requires a well-rounded strategy.

Keywords: AI, Intellectual Property, Innovation, Protection of Intellectual Property Rights

Introduction

AI has emerged as an incredible asset, transforming the way Intellectual Property (IP) is created and utilised. This innovative

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Article History: Received; 12 February 2024; Received in revised form 14 January 2025; Accepted: 07 April 2025
Available online: 14 April 2025

upheaval creates new challenges and opportunities for innovators, organisations, and policymakers. AI is empowering the formation of new sorts of IP resources, working on the proficiency of IP resources, and working with new plans of action for IP abuse. Then again, AI raises complex legal and moral issues connected with possession, patentability, copyright infringement, and information security (Marshball & Jian, 2024).

The new progression of Generative Artificial Intelligence (GAI) has entered into discussion in different areas, particularly inside IP regulation, where the creative nature of AI questions the foundations of intellectual property regulation. The use of instances of generative computer-based intelligence, machines prepared to produce craftsmanship, scholarly works, music, and other inventive work, brings into question legitimate principles overseeing origin, possession, and copyright insurance (Marshball & Jian, 2024). As the AI innovation advances and gets integrated into inventive ventures, the question of who claims the privileges in the content made by artificial intelligence, whether the substance produced by the computer-based intelligence device can be protected, has become vital furthermore applicable (Marshball & Jian, 2024).

Artificial intelligence is reforming how we collaborate with innovation and the web. As AI keeps on progressing at a remarkable speed, it is significantly affecting IP security. A rift has been created when a claim regarding the ownership of AI-generated content arises (Jones Varghese, n.d.).

These advancements have a place in the classification of GAI. A variety of content types, including text, images, audio, and other data, have been produced by AI since the creation of generative adversarial networks (GANS), a type of machine learning algorithm (Roy, 2019). Machine learning with neural networks involves extrapolating patterns from a lot of data to provide comprehensive output data (Yotov et al., 2023).

This research explores the consequences of AI-generated content and the issues of ownership in patents, and authorship and possession in copyrights, in the existing Intellectual Property Laws. The objective of this research paper is to analyse the impacts and challenges presented by AI in the domain of IP rights. It further investigates whether the IP protection of AI would require any changes to the existing IP laws. The research addresses the questions

as to the title and ascription of AI-generated works and credit of inventorship for AI-assisted inventions.

Literature Review

The exponential growth in the field of GAI has been a defining feature of recent decades, impacting both implementation and research progress. The transformative potential of GAI, yet the intersection of this technology with intellectual property (IP) law remains a contested terrain. This paper critically examines the challenges and future directions posed by GAI in the context of IP law, synthesising diverse perspectives and methodologies presented in the literature. (Brown et al., 2020). Intellectual property rights to inventors of AI-generated creations, emphasising the necessity of recognising creators' contributions amidst the increasing utility of GAI across fields. However, this perspective lacks a practical framework for implementation and raises philosophical questions about AI's role as an inventor, necessitating nuanced legal reforms (Ogwuche, P., 2022). Legislative reform, specifically modernising the Patent Act to address AI-assisted or AI-created inventions, shifts the focus to institutional mechanisms. While pragmatic, this approach introduces challenges in distinguishing between human-assisted and wholly autonomous AI outputs, thus raising questions about its feasibility (Wicklend, 2023).

The operational benefits of AI in IP management include automating asset management and improving enforcement mechanisms. Their findings underscore the efficiency gains offered by AI, contrasting with the theoretical concerns posed by Ogwuche (2022) and Wicklend (2023). However, this focus on operational efficiency might oversimplify the contextual and sector-specific complexities of GAI applications. (Ali, A. K., et al 2023). Implications of AI-generated content for IP rights, focusing on equitable compensation for creators and balancing the interests of data providers. Lucchi's emphasis on fairness aligns with Napitupulu et al.'s advocacy for international cooperation and hybrid collaboration models. Despite their shared vision, the realisation of global consensus remains a significant challenge due to varying economic and legal priorities across jurisdictions (Lucchi 2023) and (Napitupulu, P. A., Sinaga, C. A. F., & Hasugian, A. L. P. 2023). Linking IP regulation with risk management in GAI for a

uniform legal framework to address security risks while protecting IP rights adds a layer of practical urgency to the discourse. However, empirical validation is necessary to assess the viability and impact of such frameworks within existing regulatory standards. (Shi, 2023). Ethical considerations, advocating for robust strategies to safeguard IP rights while addressing the use of copyrighted works in training data. They emphasise proactive data-sourcing strategies as an ethical obligation for AI developers. This approach provides an essential balance to discussions of legal reform but may face practical hurdles, especially in regions with fragmented regulatory frameworks (Marsh Ball, X. C., and Jian, S., 2024).

Although the cited literature varies in its focus, it mainly emphasises the need for IP law reform to address the issues raised by generative artificial intelligence. Marsh Ball and Jian (2024) place a higher priority on moral behaviour, Ogwuche (2022) and Wicklend (2023) concentrate on institutional procedures and legal recognition, and Ali et al. 2023 draw attention to operational efficiency. While Shi (2023) incorporates security considerations into the legal discourse, Lucchi and Napitupulu et al. promote international cooperation. When taken as a whole, these viewpoints offer a comprehensive but disjointed understanding of how GAI and IP law interact. Wicklend's useful suggestions run the risk of being oversimplified, and Ogwuche's philosophical emphasis is unsupported by actual evidence. Adoption of Marsh Ball and Jian's ethical considerations is difficult, while Lucchi and Napitupulu et al.'s ideas of global collaboration might be too idealistic. Even though Shi's risk management paradigm is novel, it still needs to be further validated using case studies and practical implementations.

Rapid advancements in AI have transformed several businesses in the technology sector, particularly in the realms of invention and creative endeavours. AI is now capable of producing high-quality works that closely resemble those created by humans. The development, application, and protection of intellectual property (IP) are being significantly affected by these advancements. However, existing IP legal frameworks are struggling to keep pace, particularly when it comes to safeguarding AI-generated material and distinguishing between human and AI output.

If AI inventions and creations are granted intellectual property rights, there is a glaring gap in terms of the issues involved.

While some research focuses on crimes involving AI apps or software, others highlight how AI raises various issues related to patents, copyrights, and other areas. However, there is a clear knowledge vacuum about what modifications AI initiation necessitates in intellectual property rules, how to strike a balance between AI innovation and human creativity, and how AI evolves to generate, utilise, and safeguard intellectual property rights. Through this research, we were able to identify obstacles facing IP laws in the field of GAI and devise strategies for overcoming them going forward.

Methodology

In this research paper, a doctrinal research methodology is employed to achieve the objectives of the study. Data has been collected through the review of existing literature, legal documents, scholarly articles, case studies and other studies related to the intersection of AI on IP rights, to provide a comprehensive analysis of the impact of AI on intellectual property rights. The paper also analyses the current legal status of IPRs international perspective. To meet its objectives, the research studies the countries that have amended their laws regarding AI invention and creation. Notably, South Africa's patent decision involving DABUS, Canada's decision of granting authorship to AI and the UK decision involving AI invention can be patented only if and only with the name of natural persons.

Findings and Discussion

1. Impact of GAI-Generated Content on IP Laws

AI is revolutionising the creation, management, and protection of intellectual property. Ownership is one of the main problems that come up when AI is used to create intellectual property. Ownership in traditional intellectual property regimes is usually attributed to human creators or inventors. When AI is used more frequently, the ownership issue gets trickier to resolve. AI has the potential to produce innovative and non-obvious inventions, yet ownership disputes might occur when it's not clear who should receive credit for the idea (Yanisky-Ravid & Liu, 2017).

Lately, the European Patent Office (EPO) has maintained that an AI system cannot be an innovator since an inventor must be a person (*Artificial Intelligence and Patent Law -Newsletters - Publications - Legalink - a Global Network of Leading Independent Law Firm*, 2024). The United States Patent and Trademark Office (USPTO) has declared that an inventor must be a person in the US, but it hasn't yet addressed the problem of inventions produced by AI (Frąckiewicz, M, 2023).

Similar problems occur in relation to copyright legislation. AI can produce literary, musical, and artistic works of authorship. However, for a work to be eligible for copyright protection under the law, it must be created by a human author (Liebrenz et al., 2023). The question of who is the author of works generated by AI remains unresolved in the present legal frameworks, with no clear consensus on whether copyright should be awarded to the AI system itself or the organisation or person in charge of it. Some legal scholars contend that new legal frameworks are necessary since the existing ones are ill-suited to handle the complexity of AI-generated works of authorship (Liebrenz et al., 2023).

According to U.S. law, copyright ownership first belongs to the creators. There are special regulations for works created for hire (owned by employers), contributions to collective works (which have different rights for individual contributions), and ownership transfers (which can be either voluntary or involuntary) (*17 USC 201: Ownership of Copyright*, 2024). Additionally, there are protections against government expropriation, unless certain circumstances are met. As per the UK Copyright, Designs, and Patents Act 1988, the inventor or their employer is the original owner of the copyright if it was made while they were employed. Although rights cannot be asserted over duplicated portions of earlier works, copyright can be sold or transferred. Legal action can only be taken by the owner or an exclusive licensee. It is argued that both countries have not amended their laws as per the current developments of AI in IP laws (Amir, M., & Reddy, P., 2021).

The issue of possession with regard to AI-generated IP is complicated and brings up significant legal and strategic issues. The ongoing legitimate systems in many wards are not equipped to manage the intricacies of AI-generated IP, leaving vulnerability concerning who ought to be credited as the maker or designer (Ray, P. P., 2023). New legitimate structures are expected to resolve these

issues and to guarantee that the advantages of AI are acknowledged while additionally safeguarding the freedoms of IP owners (Ray, P. P., 2023).

Critics argue that granting rights to AI could undermine human creativity and innovation. There is also an issue related to criminal liability as AI lacks self-discernment and also has no capacity for punishment. Artificial intelligence may fall into an infringement trap if it uses copyrighted works without permission, as current intellectual property laws require permission and license fees, posing a significant risk to its creators.

1.1 Legal and ethical issues in AI-generated inventions: The increasing use of artificial intelligence (AI) in the creation of new inventions has resulted in a variety of legal and ethical issues regarding the ownership of AI-generated inventions and their patentability.

AI-generated developments are the subject of patentability. The way AI-generated inventions are dealt with by patent laws varies from country to country. AI-generated inventions can be patented in some countries, like the United States, as long as they meet the requirements for patentability, like being novel and not obvious. Notwithstanding, in other nations, for example, Australia and New Zealand, the law currently expects that a creation be the result of human imagination to be patentable (Ray, P. P., 2023).

Close to these legal issues, there is moreover a scope of moral considerations connected with the proprietorship and patentability of artificial intelligence-produced creations. The likelihood that human inventors will be replaced by AI-generated inventors and that jobs will be lost is a major concern. Moreover, there are worries about the effect of artificial intelligence-produced creations on society, like the potential for inclination or the production of new advancements that could be utilised for unsafe purposes.

1.2 Case Studies

i. Google, as of late, offered monetary help for an AI project intended to create local news stories (Gregory, J. 2017). Back in 2016, a consortium of exhibition halls and specialists situated in the Netherlands unveiled a picture

named 'The Next Rembrandt' (Guadamuz, A. 2017). This work of art was made by a PC that had carefully investigated various pieces created by the seventeenth-century Dutch craftsman, Rembrandt Harmenszoon van Rijn. On a basic level, this innovation should have been visible as ineligible for copyright protection because of the lack of a human maker. Accordingly, they may be utilised and reused without constraints by anybody (Guadamuz, A. 2017). This present circumstance could introduce a significant impediment for organisations selling these manifestations because the workmanship isn't safeguarded by intellectual property regulations, permitting anybody overall to utilise it without paying for it (Guadamuz, A. 2017).

ii. In the US, the Copyright Office has pronounced that it will "register a unique work of origin, given that the work was made by a person." This position streams from case regulation which determines that intellectual property regulation only secures "the products of scholarly work" that "are established in the imaginative powers of the psyche*"(Feist Publications v Rural Telephone Service Company, 1991*). Likewise, in a new Australian case, a court proclaimed that a work created with the mediation of a PC couldn't be safeguarded by copyright since it was not delivered by a human (*Acohs Pty Ltd v Ucorp Pty Ltd).*

iii. DABUS (Gadget for the Independent Bootstrapping of Brought together Awareness): DABUS is an AI-generated innovation created by Dr. Stephen Thaler that is capable of producing innovations (Ward, 2023). In 2019, Dr. Thaler documented patent applications in the US, Europe, and different nations for two developments made by DABUS: a drink compartment and a glimmering light except in South Africa where the AI machine Gadget for Independent Bootstrapping of Brought together Awareness (DABUS), is perceived as the creator, and the machine's proprietor is recognised as the patent holder (*In Thaler v. Vidal 2021*). Dr. Thaler has challenged this decision, arguing that DABUS is the true inventor of the inventions and should be recognised as such. The patent applications were rejected because an AI system cannot be listed as an inventor on a patent application. This case features the legitimate and moral

issues encompassing the responsibility for produced creations, as well as whether or not artificial intelligence frameworks can be considered designers for patent regulation.

iv. "Heart on My Sleeve," a new song by Drake featuring The Weekend, was released in April 2023. The song was not created by Drake or The Weekend, which was the issue. An AI used voice-mimicking technology to make the record, which was subsequently uploaded to many music streaming platforms (Klaes, n.d.). One cannot stress how serious this example is. Both Drake and The Weekend have received multiple Grammy awards, and billions of downloads have been made of their music. Such infringement is unlikely to cease as "Heart on My Sleeve" and other songs made in a similar manner gain in popularity *(Aaron V., Gineric R. Moran, 2023)*.

v. In a lawsuit concerning the artificial GAI artwork Suryast, the Federal Court of Canada determine whether AI can be acknowledged as an "author" under copyright law (Kriel, K., & Pakzo, 2024). CIPPIC challenges a Canadian Intellectual Property Office precedent by arguing that authorship should be limited to humans. The case may impact legislative changes about AI-generated works and reinterpret copyright law (Kriel, K., & Pakzo, 2024).

2. IP Laws Protect the Creation of AI Innovations

The current worldview holds that all works delivered by GAI are in the public space, and we will need a security component that can assign origin in these circumstances. There are now several of these things set up in countries that include the UK, Ireland, New Zealand, and India. For example, in United Kingdom, section 9(3) of the Copyright, Designs and Patents Act (CDPA) (1988) states:

> "*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."*

However, this apparent ambiguity could be resolved by applying the law on an individual basis and reading it according to its letter. If the artificial agent is directly initiated by the programmer

and produces a work of artistic merit, the programmer is deemed the author pursuant to section 9(3) of the Copyright, Designs and Patents Act (CDPA). Notwithstanding, a client obtains a program equipped for creating PC produced works, and uses it to produce another work, then, at that point, proprietorship would go to the client.

The diverse legal frameworks have an impact on the complicated topic of whether AI-generated ideas can be patented. This section of the paper compares the patent rules of several nations to examine various perspectives on the patentability of inventions produced by artificial intelligence.

- United States: AI-generated inventions are subject to the same patent eligibility requirements as any other invention in the US. The US Patent and Trademark Office (USPTO) states that any innovative and useful invention or technique, machine, manufacturing, or composition of matter that is non-obvious and sufficiently described or enabled in the patent application may be eligible for a patent (35 U.S.C. § 101). This indicates that, should they satisfy the requirements for patentability, AI-generated inventions are typically regarded as patentable in the US. There are worries, too, that granting patents to inventions produced by AI could displace human innovators and introduce new kinds of inequity (Ali, M. A., & Kamraju, M, 2023).
- European Union: The European Patent Convention (EPC) administers the patentability of GAI-produced developments in the European Patent Office (European Patent Convention [EPC], 2016). Under the EPC, an innovation might be licensed assuming it is new, includes an imaginative step, and is equipped for modern application (European Patent Convention [EPC], 2016, Art. 52[1]). As of this moment, the EPC contains no unequivocal provisos tending to the patentability of innovations created by GAI (Ali, M. A., & Kamraju, M, 2023). Notwithstanding, if computer-based intelligence created developments fulfil the necessities for patentability, for example, being novel and non-self-evident, they might be qualified for patent insurance (Ali, M. A., & Kamraju, M, 2023).

This means that AI-generated ideas may not be patentable in many nations unless they involve some degree of human

inventiveness. AI-generated inventions may or may not be patentable, depending on the national legal systems in those nations. Some nations need an innovation to be the result of human inventiveness for it to be patentable, whereas others permit the patenting of AI-generated creations as long as they satisfy the requirements for patentability.

3. Balancing the Value of Human Creation against AI Innovation and Creation

The field of intellectual property is being significantly impacted by AI technology in several ways. First, the conventional notions of authorship and inventorship are called into question by the fact that AI systems are capable of producing artistic and creative outputs like music and even patented inventions (Sorjamaa, 2016). Second, large volumes of data are needed for AI algorithms to work well, and machine learning frequently requires the use of copyrighted content (Kretschmer et al., 2024). This brings up concerns about fair usage and copyright violation. AI's predictive powers are also being used to predict trends in patent law and evaluate the likelihood of IP disputes. Lastly, AI-powered solutions are supporting IP management by making it easier to detect and stop counterfeiting and intellectual property infringement (Das, 2023). The convergence of AI and IP raises new legal questions that need to be considered for a response.

It has been suggested that AI should be granted intellectual property rights as per the South African Patent Office's grant and the court's ruling in Thaler v. Australian Commissioner of Patents (2022). Then, considering the concerns related to AI damages and the difficulty of assigning blame for the same, it is recommended that, in situations where the owner of an AI system applies to grant the AI patent ownership of an invention, particularly in situations involving less sophisticated AIs, the Patent Office, while acknowledging the AI inventor ship, should require the AI owner to be listed as a co-inventor or, at the very least, as the AI's assignee or as the applicant. Specifically, the Patent Office ought to take into account the AI inventor in order to assign liability in cases where the same happens.

This argument is important as they cannot approve or disapprove of their reasoning. Humans should be given authorship

or ownership of the creation in question if they are to be held accountable for the risks associated with AI-generated inventions.

In order to comprehend these legal ramifications, it is necessary to briefly review the ideas of vicarious liability and product liability.

Product liability, a concept from Donoghue v. Stevenson (1932), states that in cases where a producer violates their duty of care and causes harm to someone, they may be responsible for paying damages to the harmed party. The question that needs to be answered is whether the maker or owner of the device can be held accountable for a breach brought about by an AI system and whether they can be tracked down to be accountable for any violations. A claimant seeking damages for loss or injury produced by AI may rely on a product liability system; however, this would only be possible in cases where humans are acknowledged as the creators or owners of AI-generated inventions. Who would be responsible for product liability in the case of a breach being easily identified?

Vicarious liability can also be implied, even though it usually occurs in situations involving employment, partnerships, and limited liability partnerships, by law in the context at hand.

Because so many people are generally involved in the development of artificial intelligence, it is difficult to determine vicarious culpability in this field. For example, when a customer uses a meal delivery service and the software presents them with incorrect cuisine choices and information, the customer experiences monetary loss (Michalski, 2018). Therefore, the issue regarding which of the owners, data providers, or application designers of the meal delivery application should bear liability arises. The specifics of each situation will determine the response, though. The court might have to take into account particular elements, like the person who supervises and monitors the AI the most, or the person who has the greatest capacity and ability to direct or affect the AI system's behaviour. If there are several principals, they might be able to hold each of them accountable for the harm both jointly and severally. Because the buyer/user is perceived as having purchased the advantages and liabilities of the artificial intelligence machine, it would also be feasible to hold the final user accountable (Michalski, 2018).

There has also been a contention that AI devices shouldn't be held vicariously accountable for harm caused by their owners or

manufacturers since they are merely agents of those parties. This is because people create artificially intelligent machines, and the sole source of instructions for these machines is their manufacturer. Therefore, it has been suggested that the maker of the artificially intelligent computer may be held vicariously accountable for the harm that the user or customer suffers under the vicarious responsibility doctrine (Michalski, 2018). For example, if a robot used to serve food at a restaurant injures a person while performing its duties, it has been suggested that the restaurant, which is the robot's "employer"—be held vicariously accountable as the robot is employed for services (Michalski, 2018).

If AI is the sole inventor, then from the perspective of damages, AI cannot be held liable for any damage caused by its inventions, making it difficult to hold AI vicariously liable.

Although there are many ways to balance the two, the relationship between intellectual property (IP) and artificial intelligence (AI) can be complicated.

i. IP protection for AI: GAI is defenceless to licensed innovation freedoms, including proprietary advantages, copyrights, and licenses, very much like other creations. This might advance inventiveness and financing for the review and progression of computer-based intelligence (Matulionyte & Lee, 2022).
ii. Dealing with possession and authorising: At the point when GAI is created cooperatively or by a group, possession and permitting game plans should be made. By doing this, you can ensure that the creators and different patrons get the credit and cash they deserve for their contributions (Matulionyte & Lee, 2022).
iii. Handling data and privacy: Artificial intelligence frequently uses vast volumes of data, some of which contains sensitive personal data. It’s crucial to manage this data ethically and preserve privacy, while still allowing for innovation and the growth of AI (Matulionyte & Lee, 2022).

4. AI Creations and Changes in the Existing IP Laws

One possible avenue for legal reform to mitigate AI's influence on intellectual property would be to recognise AI as an autonomous creator or inventor, akin to a non-human author or

inventor. This change may resolve ownership disputes and encourage the advancement of AI technology. Alternatively, to resolve the "fair use" dilemma, copyright laws may be changed to specifically allow the use of copyrighted materials for AI training (Klosek, 2024). The predictive power of AI may need changes to patents and other intellectual property rights, which could change patent strategy and portfolio management (Klosek, 2024). In terms of enforcement, authorities should promote the creation of AI-driven detection systems to keep an eye out for and pursue infringements of intellectual property. The secret will be to design adaptable, flexible regulations that can change as technology advances (Klosek, 2024).

The Copyright Directive of the European Parliament and Council on copyright and related rights in the Digital Single Market 2019, which underwent a recent modification, serves as the primary legal foundation for copyright in the European Union. Unique scholarly works, including those delivered by artificial intelligence calculations, are safeguarded by copyright under the Order as long as they fulfil the requirements for innovativeness and inventiveness. However, the Directive does not definitively address the question of who owns the copyright to AI-created works. On the off chance that there is certainly not an unequivocal legitimate arrangement set up, proprietorship will likely be concluded under current intellectual property regulations, which commonly give possession credit to the genuine individual who made the work.

The European Commission has set up another authoritative structure, including copyright assurance, to take care of this issue regarding the licensed innovation privileges of works created by artificial intelligence as well as offering copyright insurance to man-made intelligence produced works, the proposed structure would lay out another class of "Simulated intelligence initiation" that may be possessed by the computer-based intelligence framework's designer or client instead of the human maker (European Commission, 2023).. This solicitation is as yet being explored and has not yet been supported.

Realising the potential of AI could encourage additional research and development, resulting in more sophisticated instruments and procedures that could be advantageous to both IP owners and inventors. AI-powered IP trend prediction has the potential to completely transform how inventors plan and oversee

their portfolios of intellectual property. Inventors and IP owners will, therefore, need to stay up to date on legal developments, modify their IP strategy, and even make investments in new technologies for IP creation, protection, and enforcement to conform to these changes.

The complicated snare of issues at the point of interaction of protected innovation (IP) regulation and GAI is stretching the boundaries of our ongoing legal structures. Existing laws, which were designed with human creators in mind, are challenged by the reality of AI as an inventor and creator (Blaszczyk et al., 2024). This raises significant issues of initiation, possession, and requirement. Significant inquiries incorporate the origin of AI-created works, the implementation of protected innovation privileges in a digital climate where fast replication and conveyance are typical (Blaszczyk et al., 2024).

Yet, there are deterrents to the method of progress. While IP proprietors might find it more challenging to guard and implement their freedoms, creators who use GAI in their inventive strategy might confront competition for licensed innovation privileges. Despite these potential obstructions, the advancement of AI may bring about state-of-the-art instruments that help IP proprietors and innovators (Blaszczyk et al., 2024).

IP rights may become competitive for innovators that employ AI in their creative or innovative processes if laws change to acknowledge AI as a non-human author or inventor. The speed with which AI can produce, copy, or even counterfeit digital information may make it more challenging for intellectual property owners to defend and enforce their rights. Positively, identifying AI's role may encourage additional research into the field, which could result in more sophisticated instruments and procedures that would be advantageous to both IP owners and inventors. The way inventors plan and oversee their IP portfolios may be completely transformed by the application of artificial intelligence to forecast IP trends. But to respond to these developments, innovators and IP owners will need to stay current on legal developments, modify their IP strategy, and possibly make an investment in cutting-edge technologies for the development, enforcement, and protection of IP.

5. AI-generated Works and Credit of Inventorship

According to the majority of EU members, Copyrights are only able to safeguard creative works created by humans.

In International A/S V Danske Dagblades Forening (2009)**,** the European Union Court of Justice also confirmed the necessity of originality is the Court of EU justice. The Court ruled that only original works are covered by copyrights; an author's work must be original for it to be considered creative. This is usually understood to mean that an original work needs to show the author's personality, suggesting that the existence of a human creator is necessary for a copyrighted work.

In the United Kingdom, giving the programmer who created the AI copyright protection is an additional choice. The UK Copyright, Designs and Patents Act (1988), section 9(3) stipulates that "the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken" in the instance of a computer-generated literary, dramatic, musical, or artistic work. This makes it feasible.

The US Copyright Office published a new rule in March 2023 a new rule about AI-generated works' copyright protection. According to "Works Containing Material Generated by Artificial Intelligence," copyright protection is still inapplicable to works produced by AI alone, devoid of human input (U.S. Copyright Office, 2023).

Creators have the right to be identified as the creators of their works under the majority of copyright rules, including the Berne Convention for the protection of literary and artistic works (1886). However, only human authors, not AI, are eligible for the right of attribution. (Australian Consumer Law, 2010, Section 18). It may be inaccurate and dishonest to claim human authorship for works that were produced entirely or in major part by artificial intelligence.

The European Parliament passed the AI Act on June 14, 2023, making it the first law in this region. Although there are still a number of layers of revisions, this Act must go through. It is a start toward establishing consistent guidelines and standards for the use of AI generally.

The primary goal of the EU AI Act is to control the creation, dissemination, and application of artificial intelligence within the

EU. The new guidelines set prerequisites for clients and providers in view of the level of man-made consciousness risk.

An artist submitted a request for copyright registration in 2022 for "Zarya of the Dawn," a comic book that she and Midjourney developed (Lindberg & English, 2023). At first, the claim was approved, and the Comic books are protected by copyright. But after reviewing the ruling, the US Copyright Office dismissed the copyright claim under the updated policy standards (Lindberg & English, 2023).

Artificial intelligence creations have led to a flood of patent applications. Advancements in AI, natural language handling, and PC vision have prompted the development of novel artificial intelligence applications, algorithms, and equipment. This has raised a few patent-related issues, for example, deciding inventorship and patentability.

With a unique twist, Dr. Stephen Thaler filed two patent applications in July 2019: the Device for the Autonomous Bootstrapping of Unified Sentience application. (DABUS), An artificial intelligence is credited with creating the revealed material (Matulionyte & Lee, 2022). These applications were subsequently denied by the USPTO, which claimed that the inventor's legal name was not correctly listed in the applications. The applicant then submitted a petition to the USPTO requesting a reconsideration of their stance. In response, USPTO upheld its position and declared that artificial intelligence (AI) is not capable of creating a patentable invention (Matulionyte & Lee, 2022).

In Abbott, R. (2019) patent holders have been granted grants for inventions arising from AI rather than human creativity for years, as AI is an area that is fast increasing (Abbott, R. 2016). Considering the rapid technological dissemination that artificial intelligence (AI) has seen in the past few years between 2002 and 2018, the percentage of patent applications containing AI rose from nine to sixteen percent (Toole, A., Pairolero, N., Giczy, A., Forman, J., Pulliam, C., Such, M., & Rifkin, B. 2020). According to a USPTO research, AI will probably have a similar worldwide impact to that of technologies like electricity, steam power, and the Internet as a result of this spread (USPTO, 2020). In *Thaler v. Iancu (2020)* it was held that AI-generated ideas run the risk of infiltrating the market since courts have ruled that only natural beings are capable of inventing in the public domain following revelation. As a result,

there will probably be less motivation for scientists to create new AI technology, less transparency in invention disclosures, and a decline in the validity of patents that are awarded.

This Note makes the case that patent protection for AI-created ideas should still be granted, but inventorship should be attributed to the individual who developed the AI rather than the AI itself (Ryan, A. 2016). In addition, this suggests a regulatory framework of disclosure standards for patent applications that tackles the policy issues raised by *Thaler* about the dependability, clarity, and incentive structure of patents in the AI space (Tabrez Y. Ebrahim, 2021).

The inventor uses their regulatory power to reveal what kind of AI (ANI, AGI, or ASI), if any, they used in the invention of the subject matter disclosed in a patent application. The patent applicant would include this disclosure in the specification, under oath, or in a declaration (Taylor, 2022). Publications concerning awards and applications for patents should include this information.

In Thaler v. Hirshfeld (2021) verdict by the court is significant because it discusses the patentability of inventions made by GAI (Taylor, 2022). This is because it mostly ignores a vital question: can artificial intelligence-generated ideas be granted patent protection in the US? The court does provide light on artificial intelligence inventiveness by stating unequivocally that AI is not an inventor (Taylor, 2022). It does not, however, address the question of what kind of patent protections AI-generated inventions would be eligible for (Taylor, 2022). Artificial intelligence is becoming increasingly common in a wide range of contexts, and it is also growing more advanced in terms of its capabilities and applications. Therefore, to secure and license AI systems and software so they can be used in a variety of settings and circumstances, inventors and other people who want to create and use artificial intelligence will be looking for these things. Whether developments produced by GAI can get patent security should be tended to because, in this situation, patent protection would presumably be the most worthwhile route for safeguarding computerised reasoning and innovations made by AI (Adam, L. 2021). Subsequently, the subject of patent security for thoughts in which AI is added to their creation is pivotal and will only in importance as artificial intelligence is utilised more generally and turns out to be more proficient (Adam, L. 2021).

Thaler v. Hirshfeld (2021) affected the patentability of ideas in which artificial intelligence was significantly involved in both conception and implementation (Taylor, 2022). This is because of the Thaler case, which interestingly made it official that situations where the innovator is a man-made GAI, it is not qualified for patent security. In the end, this ruling proved that AI is ineligible to be included as an inventor on a US patent application. This is in accordance with the assessments of many patent workplaces around the world, however it contrasts with those in South Africa, which gave a patent with AI recorded as the designer, and Australian where the court held that AI could be recorded as a creator on a patent application (Zacharie Tazrout, 2021).

People who work in the field of intellectual property, artificial intelligence, or AI-generated inventions are generally optimistic that changes regarding AI inventorship will occur both domestically and internationally, despite the uncertainties and worries raised. Legislative or extrajudicial decisions may result in these modifications. Listing AI and a human as co-inventors was one option put out; the caveat being that the human had to be involved in the invention's creation. This solution would resolve issues with AI ownership as well as the fact that AI does not fit neatly into the conventional definition and interpretation of an "individual" (Andrew K, 2021).

Analysis and Conclusion

In the realm of copyright, AI faces issues related to authorship and ownership. In the context of patents, there is the issue of novelty, and most of the legal systems grant inventorship only to humans, similar to copyright, however, some jurisdictions also recognise AI as inventors. A legal framework is needed to address the issues that will arise in the future as AI continues to evolve, introducing new ideas and potential infringements. Different national and international jurisdictions handle these claims according to their traditions, laws, and logical reasoning**.**

Some may propose changing copyright rules to acknowledge AI as authors or creators. However, this presents practical and philosophical questions regarding the nature of creativity and the intended use of copyright. There are various ways that governments and organisations can promote a responsible AI environment.

University-led research on AI ethics and safety might be supported by public research funds, fostering open and varied development. Voices influencing AI ethics and accountability are amplified by tech worker activism and advocacy organisations such as AI unions. AI developments are in line with ethical standards and the public interest thanks to public-private cooperation. To ensure that AI serves social needs over corporate profits, prevent Big Tech from controlling the market, and create a more egalitarian and accountable AI ecosystem, bold legislative measures are necessary. The second strategy is called "Alternative Ownership Models," which involves thinking about different ownership arrangements like giving the AI creator or operator the rights or establishing a new class of rights just for works produced by AI (Moraitis, 2024). Human-centric models are the most practical across all legal systems. Because they are consistent with current IP laws and necessitate few legislative modifications. Due to ethical and legal limitations, AI entity ownership presents substantial challenges in both common and civil law systems. Although shared ownership models show promise, their clarity and enforcement require specific legal frameworks and international cooperation.

The third option is the implementation of obligatory licensing programs for AI-generated works (Smith, 2024). This might allow for the usage of these works while guaranteeing that the owners of the rights are fairly compensated.

The use of current doctrine comes in fourth. While not a complete answer, applying established legal theories, such as work done for hire or collaborative authorship, may provide a temporary fix.

Legislators should provide unambiguous legal frameworks, encourage public-private cooperation, make capacity-building investments, encourage innovation, and unify international norms. Industry Leaders should put ethics first, teach employees, interact with legislators, maintain openness, and encourage research and development.

Academicians should put an emphasis on interdisciplinary research, train the next generation of leaders, communicate findings honestly, work with stakeholders, and record case studies. The goal of these initiatives is to align ethical, technical, and legal developments for the good of society. Building a robust and progressive legal framework requires striking a balance between the

interests of encouraging innovation and creativity and the need to protect and reward human creators.

Granting protection to AI generated content may leads to issues of job depreciation to humans, loss to human creativity which force people to think differently and produce something novel, as AI has already provided data which can be use quickly to produce any invention or write any literary, music or artistic work without paying their legitimate fees. Granting IP rights to AI may raise the issue of liability in case of any crime, financial or monetary loss, or if an individual wants to seek damages in case of a violation, who would be held liable. By applying the concept of product and vicarious liability, this issue may be resolved to some extent. While there are significant obstacles to AI's incorporation into IP but recognising the revolution of AI in IP may advance the world and encourage others to invest in research and innovation to get benefits in the world of technology. As copyrights and patents have historically required human involvement, according to jurisdictions around the world, including the US, UK, EU, and others. Legislation and courts frequently reject AI as an autonomous author or inventor in favour of originality and human innovation. But these conventional frameworks are being challenged by developments in AI. Broader implications of AI concerning intellectual property (IP), especially concerning creativity and innovation. While AI in intellectual property (IP) offers chances for investment and technological growth, it also poses problems for human innovation, attribution, and liability. AI's involvement is putting increasing strain on current IP laws, which favour human creativity and there is, therefore, a need for updated legislation. Fostering innovation while preserving legal clarity, equity, and ethical accountability requires a well-rounded strategy.

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