

LEGAL CHALLENGES OF ARTIFICIAL INTELLIGENCE AS A CREATOR IN PATENT AND COPYRIGHT

Chukwubuikem I. Obianyo*

Abstract

Artificial Intelligence has transcended its role as a mere tool to become an independent creator of literary, artistic, and inventive works. This evolution challenges traditional intellectual property laws, particularly in the domains of patents and copyright, where human authorship and inventorship have long been foundational principles. This article critically examines the legal challenges AIgenerated works pose to conventional patent and copyright frameworks, with a focus on originality, authorship, and ownership under existing laws. In copyright law, the requirement for human authorship raises significant issues regarding the eligibility of AI-generated works for protection. The jurisprudence from jurisdictions such as the United States, the European Union, and Nigeria underscores the reluctance of legal systems to recognize AI as an author, often resulting in the denial of copyright protection. Similarly, in patent law, the concept of inventorship remains tethered to human ingenuity, as demonstrated by global judicial and administrative rejections of AI-invented patents, such as in the DABUS case. This article adopts the doctrinal method of legal research, relying on statutes, case law, and scholarly literature to analyze these doctrinal and policy challenges. It further evaluates whether traditional IP laws can be adapted to accommodate AI as a creator or whether entirely new legal regimes are necessary. In light of these challenges, the article recommends a hybrid legal framework that recognizes AI-assisted creations while maintaining a degree of human oversight. It also proposes legislative reforms to redefine authorship and inventorship in a way that accommodates technological advancements.

Keywords: AI-generated Works, Artificial Intelligence, Copyright, Intellectual Property and Patents.

1.0 Introduction

The rise of artificial intelligence has led to revolutionary changes across various sectors, including the field of intellectual property law. AI systems are now capable of generating works that were traditionally attributed to human creators. These AI-generated works include artworks, literature, music, and even inventions. As AI continues to evolve, questions surrounding the legal recognition and protection of such works have become prominent. This rapid advancements in artificial intelligence¹ have transformed the landscape of innovation and creativity, introducing novel challenges and opportunities for intellectual property² law. AI, which refers to systems capable of performing tasks traditionally requiring human intelligence, such as learning, reasoning, and decision-making, has evolved beyond mere automation to become a creator of works and inventions in its own right.³ For instance, AI has been used to compose music, write literature, generate visual art, and even invent technological solutions, raising profound questions about the adequacy of existing IP frameworks to address the legal complexities of such outputs.⁴

Intellectual property law, traditionally rooted in principles of human creativity and ingenuity, aims to incentivize innovation by granting exclusive rights to creators and inventors. These rights,

^{*}Chukwubuikem I. Obianyo, Ph.D, Research Candidate and Law Lecturer at University on the Niger, Umunya; <u>chukwubuikem.obianyo@uniniger.edu.ng</u>; +234(0)7039319179

¹ Hereinafter referred to as AI.

² Hereinafter referred to as IP.

³ C Millard, *Cloud Computing Law* (2nd Edition, Oxford University Press, 2021).

⁴ WIPO, Artificial Intelligence and Intellectual Property: A Legal Perspective (World Intellectual Property Organization, 2021).

which include patents, copyrights, and trademarks, are premised on the assumption of human authorship and ownership.⁵ Copyright law protects original literary, artistic, and musical works, while patent law safeguards novel inventions and technological advancements. However, the emergence of AI-generated works challenges these traditional frameworks. Can an AI system be legally recognized as an author or inventor? If not, who holds the rights to AI-generated works - the programmer, the user, or no one at all? These questions remain at the center of an ongoing global debate on the intersection of AI and IP law. For example, in the Australian case of *Thaler v. Commissioner of Patents*,⁶ a patent application involving an AI system named DABUS as the inventor was rejected by the European Patent Office and the United States Patent and Trademark Office on the grounds that an inventor must be a natural person. This case underscores the difficulty of reconciling the role of AI in innovation with existing IP laws.⁷

This article critically examines the legal challenges posed by AI-generated works in the context of copyright and patent law. Adopting a doctrinal research methodology, the study analyzes existing legal provisions, case law, and policy debates to assess the adequacy of current IP laws in addressing AI-related complexities. It further explores potential reforms, including the adoption of a hybrid legal framework, legislative amendments, and the development of alternative protection mechanisms. Ultimately, this study aims to contribute to the discourse on the future of intellectual property law in an era increasingly shaped by artificial intelligence.

2.0 Meaning of Intellectual Property

Intellectual property is an expansive, broad area of law with several aspects.⁸ Getting a generally accepted meaning of the concept of intellectual property has not been easy. However, for the purpose of this work, the best place to start is with a consideration of the meaning of the word property, and thereafter, Intellect or intellectual. Thus, property is defined as anything owned by a person or entity.⁹ Property is a term describing anything that a person or a business has legal title over, affording owners certain enforceable rights over said items. Examples of property, which may be tangible or intangible. Intangible properties, like design concepts, song lyrics, books, and screenplays, are categorized as intellectual properties.

Even though these are not physical in nature, they may carry significant value.¹⁰ It was also defined as anything that a person or business has legal title over.¹¹ The outstanding features that most types of property share are that the owner of the property is free to use it as she/he wishes, provided the use is not against the law, and to exclude others from so using that owned item of property.

Intellect is the mental equivalent of athletic ability or fashion sense, so someone is an intellect if they have great intellectual ability just as an athlete is someone who has great athletic ability. Intellect is something everyone has in some degree.¹² Intellectual on the other hand describes something or anything related to or using the mind or brains or intelligence.¹³ Intellectual Property is an intangible property that is the result of creativity, such as patents, copyrights, etc.¹⁴ it is a property that results from original creative thought, as patents, copyright material, and trademarks.¹⁵

⁵ R Abbott, 'I Think, Therefore I Invent: Creative Computers and the Future of Patent Law', *Boston College Law Review* 1079 (2016) 57(4).

^{6 [2021]} FCA 879

⁷ [2021] FCA 879.

⁸ CC Nwabachili, *Intellectual Property Law and Practice in Nigeria*, (2nd Edition, Lagos: Malthouse Press Ltd, 2016) 1

⁹ <<u>www.definitions.uslegal.com/p/property-law></u> accessed 17 February 2024

¹⁰ <<u>https://www.investopedia.com/terms/p/property.asp</u>> accessed 17 February 2024

¹¹ <<u>www.investopedia.com/terms/p/property></u> accessed 17 February 2024

¹² <<u>https://www.vocabulary.com/dictionary/intellect</u>> accessed 18 February 2024

¹³ <<u>www.vocabulary.com/dictionary/intellectual</u>> accessed 17 February 2024

¹⁴<<u>https://www.google.com/search?q=meaning+of+intellectual+Property&oq=meaning+of+intellectual+Property&aqs=c</u> <u>hrome..69i57.10051j0j7&sourceid=chrome&ie=UTF-8</u>> accessed 23 February 2021

¹⁵ <<u>https://www.dictionary.com/browse/intellectual-property</u>> accessed 23 February 2024

WIPO¹⁶ defined Intellectual property as creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. This definition emphasizes the broad spectrum of IP, encompassing both industrial property, such as patents, trademarks, and industrial designs, and copyright, which protects literary, artistic, and musical works. These rights serve as incentives for creativity and innovation, providing legal assurance to creators that their work will be protected from unauthorized use or reproduction.¹⁷ Interestingly, the term intellectual property in the Convention Establishing WIPO does not have a more formal definition. The States that drafted the Convention chose to offer an inclusive list of the rights as relating to:

Literary artistic and scientific works; performances of performing artists, phonograms, and broadcasts; inventions in all fields of human endeavor; scientific discoveries; industrial designs; trademarks, service marks, and commercial names and designations; protection against unfair competition; and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields.¹⁸

Intellectual Property further refers to the legal rights granted to individuals or entities over their creations of the mind. These rights provide creators with exclusive control over the use, distribution, and exploitation of their intellectual creations for a specified period, ensuring they can benefit from their efforts. The concept of IP is rooted in the recognition that intellectual creations, though intangible, are valuable assets that contribute to economic, cultural, and technological advancement.

The Black's Law Dictionary defined Intellectual Property as a category of intangible rights protecting commercially valuable products of human intellect¹⁹. Also, the term "Intellectual Property Rights" refers to the legal rights granted with the aim to protect the creations of the intellect. These rights include Industrial Property Rights (e.g. patents, industrial designs and trademarks) and Copyright (right of the author or creator) and Related Rights (rights of the performers, producers and broadcasting organizations).²⁰ In legal terms, IP encompasses a range of protections designed to safeguard different types of intellectual creations. Under the Nigerian framework, IP is governed by statutes such as the Copyright Act 2022, the Patents and Designs Act, and the Trademarks Act. These laws collectively protect works that meet specific criteria, such as originality, inventiveness, or distinctiveness, granting rights that allow creators to control the use and exploitation of their creations. For example, the Copyright Act 2022²¹ grants authors exclusive rights over their literary, musical, or artistic works, ensuring recognition and financial benefit.

Globally, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) provides a harmonized framework for IP protection. It defines IP as the legal rights associated with patents, copyrights, trademarks, industrial designs, geographical indications, trade secrets, and more.²² This agreement underscores the importance of IP in fostering global trade and innovation, highlighting its dual role as a private right and a tool for societal progress.

Despite its significance, IP faces several challenges in the modern era. The rapid pace of technological advancement, coupled with the global nature of commerce, has complicated the enforcement of IP rights. Digital technologies have made it easier to replicate and distribute protected works without authorization, leading to widespread issues such as piracy and copyright infringement.²³

¹⁶ WIPO is the global forum for <u>intellectual property</u> (IP) services, policy, information and cooperation. The forum is a self-funding agency of the <u>United Nations</u>, with 193 member states. Its mission is to lead the development of a balanced and effective international IP system that enables innovation and creativity for the benefit of all. Its mandate, governing bodies and procedures are set out in the <u>WIPO Convention</u>, which established WIPO in 1967 ¹⁷<<u>https://www.wipo.int/about-ip/en/</u>> accessed 28 February 2024

¹⁸ Convention Establishing the World Intellectual Property Organization (WIPO), Signed at Stockholm on 14 July, 1967; Article 2(Viii)

¹⁹B.A. Garner, *Black's Law Dictionary* (8th ed., United States of America, Thomson West, 2004) 824.

²⁰<<u>www.iprhelpdesk.eu></u> accessed 3 February 2024

²¹ Copyright Act, 2022, An Act to repeal the Copyright Act Cap. C28, Laws of the Federation of Nigeria, 2004, and provide a new law for the protection of copyright in Nigeria and related matters.

²² TRIPS Agreement, 1994.

²³ L Ruth, *Digital Frontiers: Intellectual Property and the New Media* (Oxford University Press, 2023)

Additionally, emerging fields such as artificial intelligence and biotechnology are testing the limits of traditional IP frameworks, raising questions about authorship, ownership, and the scope of protection. Intellectual Property further refers to the legal rights granted to individuals or entities over their creations of the mind. These rights provide creators with exclusive control over the use, distribution, and exploitation of their intellectual creations for a specified period, ensuring they can benefit from their efforts. The concept of IP is rooted in the recognition that intellectual creations, though intangible, are valuable assets that contribute to economic, cultural, and technological advancement.

2.1 What is Copyright?

Copyright is a form of intellectual property. It has been defined by Black's Law Dictionary,²⁴ as a right granted to the author or originator of certain literary or artistic productions, whereby the creator is invested, for a limited period, with the sole and exclusive privilege of multiplying copies of the literary or artistic works and publishing or selling them. Copyright in an intellectual work is that exclusive right of the author of the original work to control or enable the doing of certain expressly stated acts in respect of the whole or substantial part of the work either in its original form or in any other recognizably derived from the original form but subject to certain statutory exceptions. Copyright, in essence, ensures that creators can prevent unauthorized use, reproduction, or distribution of their works for a specific period. This legal protection, offered by national and international laws, is intended to incentivize creativity while balancing the interests of both creators and the public. This explanation will delve into the core concepts of copyright law, focusing on its scope, rights, and limitations, with reference to Nigerian and international legal frameworks. In Nigeria, copyright is primarily governed by the Copyright Act,²⁵ The Act provides protection for various types of works, including literary, musical, and artistic works, as well as cinematographic films, sound recordings, broadcasts, and computer programs. The National Copyright Commission is the regulatory body responsible for overseeing and enforcing copyright matters in Nigeria. Copyright is granted to works that are original, creative, and fixed in a tangible medium of expression, meaning that the work must be captured in some form, such as written text, recorded music, or digital files, to be protected. Importantly, copyright law only protects the expression of ideas, not the ideas themselves, meaning that the specific manifestation of an idea is protected, while the underlying concept or idea remains unprotected unless it is also a separate creation.²⁶ Section 1(1)(a-f) of the Act provides for works protected by copyright which include; Literary works, Musical works, Artistic works, Cinematograph films, Sound recordings, Broadcasts. The Copyright Act in Nigeria grants the creator exclusive rights to their works, allowing them to reproduce the work, distribute copies, perform the work publicly, display it publicly, and adapt the work. The protection granted by copyright law is exclusive to the author of the work, meaning that no one else may use the work for the purposes listed without the author's permission, except in cases where the law provides specific exceptions. These rights are fundamental in allowing creators to control how their works are exploited and ensuring that they can derive economic benefits from their creativity.²⁷ Internationally, copyright protection is governed by key treaties, notably the Berne Convention²⁸ and the TRIPS Agreement²⁹, which is part of the World Trade Organization's framework. These treaties ensure that copyright protection is extended beyond national borders, meaning that works created in one member country are automatically protected in all other member countries. The Berne Convention establishes the principle of national treatment, requiring that works originating from one

²⁴ BA Garner, Black's Law Dictionary (8th ed., United States of America, Thomson West, 2004) 824

²⁵ Nigerian Copyright Act, Act No. 8 of 2022.

²⁶ (n 4).

²⁷ National Copyright Commission, "Copyright Law and Practice in Nigeria".

²⁸ Berne Convention for the Protection of Literary and Artistic Works, 1886.

²⁹ Agreement on Trade-Related Aspects of Intellectual Property Rights.

member country be granted the same protection in other member countries as the works of those countries' nationals. This framework facilitates the international recognition and enforcement of copyright.³⁰

Copyright infringement occurs when a work is used without the creator's permission, and the work is not covered by a legal exception. Infringement may include unauthorized reproduction, distribution, public performance, or adaptation of the work. In Nigeria, copyright holders can seek both civil and criminal remedies for infringement. Civil remedies include injunctions to stop the infringement, damages to compensate the creator for their loss, and an account of profits, where the infringer is ordered to account for any profits made from the unauthorized use of the work. Criminal remedies may include fines or imprisonment for willfully infringing copyright. The enforcement of copyright in Nigeria is handled by the National Copyright Commission, which plays a central role in investigating violations and ensuring that creators' rights are upheld.³¹ Overall, there are two criteria by which a work is adjudged to be eligible for copyright protection in Nigeria: originality and fixation.³² According to the Act³³ it is not sufficient to have created a work; such work will only be eligible for legal protection if: Sufficient effort has been expended on making the work to give it an original character; The work has been fixed in any definite medium of expression now known or later to be developed, from which it can be perceived, reproduced or otherwise communicated either directly or with the aid of any machine or device.

Thus, all copyright works must be original and expressed or fixed in a definite medium to be protected under the law. Originality within this context does not connote inventiveness or novelty. It simply denotes that the work was not copied or plagiarized. This is because copyright does not protect ideas but rather how ideas are expressed. It is pertinent to note that works that satisfy the above conditions enjoy automatic copyright protection without registration or compliance with any formal rules. Nonetheless, the Nigerian Copyright Commission (NCC) provides owners of copyrights the option to deposit a copy of their works with the NCC and receive a certificate that serves as notification of the existence of the work to the general public.³⁴

2.2 What is Patent?

In Nigeria, patents are governed by the Patents and Designs Act.³⁵ The Act defines a patentable invention as a product or process that is new, involves an inventive step, and is capable of industrial application. This reflects the globally accepted criteria for patentability, ensuring that only genuinely innovative and useful inventions are granted protection. A patent provides the owner with exclusive rights for twenty years from the filing date, subject to the payment of annual renewal fees.³⁶ The process of obtaining a patent in Nigeria involves filing an application with the Patents and Designs Registry under the Federal Ministry of Industry, Trade, and Investment. The application must include a request for a patent, a description of the invention, claims defining the scope of protection sought, and any necessary drawings. Once granted, the patent confers upon the owner the exclusive right to exploit the invention commercially, ensuring that they can recoup their investment and profit from their ingenuity.³⁷ A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application. Also, patents is the granting of a property right by a sovereign authority

³⁰ Article 5(1).

³¹ See the case of National Copyright Commission v. C.C. Cosmas & Co. Ltd (2005) 5 NWLR (Pt. 919) 340

³²<<u>https://www.mondaq.com/nigeria/copyright/692416/an-overview-of-copyright-protection-in-nigeria-part-1</u>> accessed 17 February 2024

³³ Copyright Act, S. 1(2)

³⁴ Copyright Act, S.34(2)

³⁵ Laws of the Federation of Nigeria 2004, Cap P2.

³⁶ Patents and Designs Act, Cap P2, S. 1 and 7

³⁷ Patents and Designs Act, Cap P2, S. 3

to an inventor. This grant provides the inventor exclusive rights to the patented process, design, or invention for a designated period in exchange for a comprehensive disclosure of the invention.³⁸ The Patent and Designs Act³⁹ is the law regulating Patent inventions in Nigeria. Patent registration in Nigeria confers an exclusive right on the holder for a period of 20 years; the right to exclude others from making, using, or selling an invention in the country it is obtained without permission or consent during the lifespan of the patent.⁴⁰ On Rights and protection conferred by registration of a patent or design, the court in the case of *Densy Ind. Ltd. v. Uzokwe*⁴¹ By virtue of section 19(1) of the Patents and Designs Act, registration of an industrial design confers upon the registered owner the right to preclude any other person from doing any of the following acts: (a) reproducing the design in the manufacture of a product; (b) importing, selling or utilizing for commercial purposes a product reproducing the design; (c) a holding such a product for the purpose of selling it or utilizing it for commercial purposes.

On Requirements of an application for registration of a patent or design, the court also held that an application for the registration of an industrial design shall be made to the registrar and shall contain a request for registration of the design and the applicant's full name and address and, if that address is outside Nigeria an address for service in Nigeria.⁴² On who can apply for registration of a design or patent - Under the Patents and Designs Act, there is no requirement that an application for registration of design shall be made only by or on behalf of a juristic person. Invariably, a non-juristic person can apply for the registration of a design or a patent. Although Patents and Designs Act,⁴³ itself does not define the word "person", para- graph 23 of the Part II of the First Schedule, defines the word "person" for the purpose of that Part as "includes the government or ministry". Since neither government nor ministry is a juristic person it can safely be inferred that non-juristic person can apply for the registration of design or a patent.

In the Nigerian context, patent protection is particularly relevant in sectors such as pharmaceuticals, agriculture, and technology, where innovation is crucial for addressing societal challenges. For instance, patents on pharmaceutical inventions ensure that inventors are rewarded for developing life-saving drugs while balancing the need for public access through mechanisms such as compulsory licensing. Compulsory licensing allows the government or third parties to use a patented invention without the owner's consent under specific conditions, such as public health emergencies.⁴⁴ It suffices to say that patents are a cornerstone of intellectual property law, providing robust incentives for innovation and ensuring that inventors can reap the rewards of their ingenuity. By balancing the interests of patent owners and the public, patent law fosters technological progress, economic growth, and societal well-being. As the world continues to grapple with complex challenges and embrace new technologies, patents will remain a vital tool for driving innovation and addressing global needs.

3.0 Meaning of Artificial Intelligence

The term "Artificial Intelligence" was first coined by John McCarthy in 1956 during the Dartmouth Conference, which is considered the foundational event for AI as a discipline. McCarthy⁴⁵ defined AI as "the science and engineering of making intelligent machines." This definition encapsulates both the theoretical aspects and practical applications of AI, reflecting its dual nature as both a scientific pursuit and a technological innovation. Thus, Artificial Intelligence refers to the simulation

³⁸ Ibid

³⁹ The Patents and Designs Act Cap P2 LFN 2004

⁴⁰<<u>https://www.mondaq.com/nigeria/patent/1160022/patent-protection-in-nigeria-improvements-and-discoveries</u>>

accessed 17 February 2024

^{41 (1999) 9} NWLR (Pt. 567) 66

⁴² Patents and Designs Act, S. 15(1).

⁴³ Cap. 344

⁴⁴ Patents and Designs Act, Cap P2, S. 11

⁴⁵ McCarthy et al., Proceedings of the Dartmouth Conference, 1956

of human intelligence in machines that are designed to think and act like humans. This encompasses a broad spectrum of technologies and methods that enable machines to perform tasks traditionally requiring human cognitive abilities, such as learning, reasoning, problem-solving, understanding language, and perception. The essence of AI lies in creating systems capable of mimicking intelligent behaviors to varying degrees, from simple automation to advanced decision-making. AI has evolved over the decades, encompassing a variety of approaches, including rule-based systems, machine learning, neural networks, and natural language processing. The continuous advancement in computational power and the availability of large datasets have significantly contributed to the rapid development of AI technologies. This evolution has made AI an integral part of various industries, transforming the way tasks are performed and decisions are made. AI is often divided into two categories: narrow AI and general AI. Narrow AI refers to systems designed to perform specific tasks, such as facial recognition or language translation, with a high degree of efficiency. General AI, on the other hand, aspires to replicate the full range of human cognitive abilities, enabling machines to perform any intellectual task that a human can do. While narrow AI is prevalent today, general AI remains a theoretical concept and a goal for future research.

In the Nigerian context, the adoption of AI is steadily growing across various sectors, including finance, healthcare, education, and agriculture. NITDA⁴⁶ has introduced policies aimed at fostering AI development and adoption. Internationally, AI has been at the forefront of technological innovation, driven by advancements in machine learning, natural language processing, and robotics. The European Union's AI Act⁴⁷ and initiatives by the Organization for Economic Cooperation and Development,⁴⁸ such as the OECD Principles on AI, represent efforts to regulate AI development and ensure its responsible use. These principles advocate for transparency, fairness, accountability, and respect for human rights in AI systems. The meaning of AI extends beyond its technical definition, encompassing its philosophical and ethical implications. Philosophically, AI challenges traditional notions of intelligence, consciousness, and agency. It raises questions about what it means to be intelligent and whether machines can possess a form of consciousness or self-awareness. Ethically, AI necessitates considerations about its impact on society, including issues of fairness, accountability, and the potential for misuse. AI's reliance on data and algorithms underscores the importance of understanding its meaning within the context of data ethics. Data serves as the foundation for AI systems, influencing their performance and decision-making capabilities. The quality, diversity, and representativeness of data play a crucial role in determining the fairness and accuracy of AI outcomes. Bias in data can lead to biased AI systems, perpetuating existing inequalities and discrimination. In the Nigerian legal landscape, the meaning of AI is gradually being explored through legislative and regulatory initiatives. While there is no comprehensive AI-specific legislation, existing laws such as the Cybercrimes Act⁴⁹ and the Nigeria Data Protection Regulation⁵⁰ provide a foundational framework for addressing issues related to data security and privacy in AI applications. The meaning of AI is also shaped by its cultural and societal contexts. In Nigeria, cultural attitudes towards technology influence the acceptance and adoption of AI. Education and awareness campaigns are essential for fostering a deeper understanding of AI and its potential benefits, particularly in underserved communities. Bridging the digital divide and ensuring equitable access to AI technologies are critical for realizing their full potential.

Globally, the meaning of AI continues to evolve as new technologies and applications emerge. The integration of AI with other advanced technologies, such as quantum computing, blockchain, and the Internet of things, is expanding its capabilities and reshaping its significance. These synergies are expected to drive innovation and address complex challenges in areas such as cybersecurity, supply chain management, and personalized medicine.

⁴⁶ National Information Technology Development Agency

⁴⁷ Regulation (EU) 2021/0106 of the European Parliament and of the Council of 21 April 2021

⁴⁸ OECD AI Principles, 2019.

⁴⁹ Cybercrimes (Prohibition, Prevention, etc.) Act, 2015

⁵⁰ Nigeria Data Protection Regulation, 2019



3.1 Artificial Intelligence-Generated Works

Artificial Intelligence has revolutionized numerous fields, including art, literature, music, and software development, by generating creative works. These AI-generated works have raised complex legal questions, particularly concerning their status under intellectual property law. As AI systems such as OpenAI's GPT models⁵¹ and image generators like DALL-E⁵² continue to advance, they challenge traditional IP frameworks designed for human creators. The objectives of this chapter are to analyze the legal recognition of AI-generated works under existing IP laws, explore the policy and practical implications of granting IP rights to AI-generated works, and recommend reforms for accommodating AI-generated works within contemporary IP frameworks.

AI-generated works refer to creations autonomously produced by AI systems with minimal or no human intervention. These works include, but are not limited to, textual content, visual art, music compositions, and software programs.⁵³ AI's role in creative industries has evolved significantly from rule-based systems for generating text and music in the 1950s-1980s, to machine learning techniques enabling adaptive and data-driven creations in the 1990s-2010s, and finally to generative AI systems like GPT-4, DALL-E, and DeepMind's AlphaCode dominating creative outputs in the 2020s. AIgenerated works are data-driven, autonomous, and non-conscious, which distinguishes them from traditional human-authored works.

Under the Berne Convention,⁵⁴ and TRIPS Agreement, copyright protects original works of authorship. National statutes, such as the UK Copyright, Designs and Patents Act 1988 and the US Copyright Act 1976, emphasize human authorship as a criterion for protection. Jurisdictional approaches vary significantly. In the United States, the Copyright Office rejects protection for non-human authors, as seen in *Naruto v Slater*⁵⁵, where a macaque's selfie was deemed unprotectable. In the United Kingdom, the CDPA extends copyright to computer-generated works, provided there is sufficient human involvement.⁵⁶ Similarly, the Court of Justice of the European Union in *Infopaq International A/S v Danske Dagblades Forening*⁵⁷ emphasized the necessity of intellectual creation. AI systems often generate inventions, raising questions about patent ownership and inventorship. In *Thaler v Comptroller General of Patents*⁵⁸, the UK Court of Appeal rejected the notion that an AI could be an inventor under the Patents Act 1977. AI-generated branding materials can qualify for trademark protection if they meet distinctiveness requirements, although issues arise regarding ownership when an AI autonomously designs such materials.

To address these challenges, existing laws should be amended to explicitly recognize AIgenerated works, with clear criteria for authorship and ownership. International guidelines led by WIPO could harmonize regulations on AI-generated works. Additionally, licensing models where programmers, users, and AI systems share rights through agreements could promote equitable distribution of benefits. AI-generated works present both opportunities and challenges for the IP landscape. Balancing innovation and legal protection require adaptive and forward-thinking reforms.

4.0 Legal Challenges and Opportunities

One of the primary legal challenges regarding AI-generated works is determining the ownership of these creations. Under current IP laws, ownership is typically assigned to the individual or entity that

55 [2018] 9th Cir 852 F 3d 1085.

⁵¹ OpenAI's GPT (Generative Pre-trained Transformer) is a state-of-the-art language model designed to understand and generate human-like text. It uses deep learning techniques and is trained on large datasets to perform a variety of tasks.
⁵² DALL-E is another groundbreaking AI model developed by OpenAI, specifically designed for generating images from

textual descriptions. Named after the artist Salvador Dalí and Pixar's WALL-E, it combines creativity and technology to produce visually stunning, often highly imaginative, results.

⁵³ Smith, Artificial Intelligence and Copyright Law (2nd edn, Oxford University Press 2022).

⁵⁴ Berne Convention for the Protection of Literary and Artistic Works 1886.

⁵⁶ S. 9(3)

⁵⁷ [2009] ECR I-6569.

⁵⁸ [2021] EWCA Civ 1374; [2021] RPC 27.

created or authored the work. However, in the case of AI-generated works, the question arises: who owns the rights to the works created by AI? Since AI systems are not legal persons and cannot own intellectual property rights, this creates a gap in the law. Traditionally, human authors have been the subject of copyright and patent law. Yet, as AI systems generate works autonomously or with minimal human input, the ownership rights become unclear. This ambiguity is particularly evident in copyright law, where the concept of authorship has long been tied to human creativity.⁵⁹

The challenge of attributing authorship to an AI-generated work becomes even more complicated when considering the role of humans in the creative process. In some instances, the AI might have been programmed with specific algorithms designed by human programmers, and the work it generates could be based on inputs from human designers or operators. However, if the AI generates works entirely autonomously without direct human input, assigning authorship becomes more problematic. The United States Copyright Office has addressed this issue by affirming that works created by non-human authors, such as AI, are not eligible for copyright protection.⁶⁰

Similarly, patent law faces challenges in relation to inventions generated by AI. The question of whether an AI system can be listed as the inventor of a patent has led to significant debate in legal circles. In the case of *Thaler v. The Comptroller General of Patents*⁶¹, the UK High Court ruled that AI cannot be named as the inventor of a patent, affirming that an inventor must be a human being. This ruling aligns with the stance taken by the European Patent Office, which requires human inventors for patent applications. However, this limitation may hinder the growth of innovation, especially as AI systems become more involved in the invention process. Despite these challenges, there are significant opportunities for adapting intellectual property laws to accommodate the growing role of AI in creation and innovation. One opportunity lies in the potential to amend copyright and patent laws to allow for a new category of "AI-generated works." By expanding IP frameworks to account for AI, policymakers could create clear guidelines on how ownership, attribution, and protection would apply to these works. This could include provisions for AI to be recognized as a tool used by human creators, with ownership attributed to the programmers or operators who created the AI system or provided the inputs that led to the creation of the work.

Additionally, AI could offer new forms of collaboration between human creators and machines. Instead of viewing AI as a replacement for human creativity, it could be seen as a tool that enhances the creative process. For example, artists could use AI to generate new styles of art or music that they may not have been able to create on their own, leading to novel works that may not have been possible without the involvement of AI.⁶² In this sense, AI could be viewed as a collaborative partner in the creative process, with human creators maintaining their traditional rights to authorship while still benefiting from the contributions of AI. Thus, the intersection of AI and intellectual property law presents both significant challenges and opportunities. As AI-generated works become more prevalent, the need for clear legal frameworks to address issues of ownership, attribution, and protection becomes more urgent.

4.1 Patentability of Artificial Intelligence-Generated Inventions

The patentability of inventions generated by artificial intelligence has emerged as a key area of concern within intellectual property law. As AI systems become more sophisticated and capable of producing inventions that were once considered to be the exclusive domain of human inventors, legal questions have arisen as to whether AI-generated inventions should be eligible for patent protection. The patent system is founded on the principle that inventions must be novel, non-obvious, and useful, and traditionally, these criteria have been applied to inventions created by human inventors. However, with the increasing involvement of AI in the innovation process, the question of who

⁵⁹ JE Cohen, *The Regulation of Artificial Intelligence and Intellectual Property* (Cambridge University Press, 2022)

⁶⁰ U.S. Copyright Office, Compendium of U.S. Copyright Office Practices (2021)

⁶¹ [2021] EWHC 2412

⁶² DJ Gervais, 'The Machine as Author' University of Toronto Law Journal (2020) 70 16-39



should be credited as the inventor, and whether AI-generated inventions should be patentable, requires careful examination.

The primary challenge in granting patent protection to AI-generated inventions revolves around the issue of inventorship. Patent law, both domestically and internationally, traditionally recognizes inventors as natural persons—humans who conceive of the inventive idea. This has led to significant ambiguity when an AI system autonomously generates an invention, potentially without any direct human contribution to the idea itself. AI systems are not legal persons and, under current patent law, cannot be listed as inventors. This has created a conundrum for patent applicants who wish to patent inventions generated by AI. In the landmark *Thaler* case,⁶³ the High Court ruled that the AI system in question could not be recognized as an inventor, reinforcing the traditional view that inventorship must be attributed to a human being. This decision underscores the existing limitations of patent law in accommodating the realities of AI-driven invention. Despite these challenges, there are arguments in favor of revising patent laws to allow for AI-generated inventions to be recognized as patentable. One potential reform is to create a new category of patent ownership for AI-generated inventions. This would involve recognizing the human or legal entity behind the AI system as the rightful inventor or owner of the patent.

Another key issue is the nature of the inventive process when it comes to AI-generated inventions. Patent law requires that inventions meet certain criteria, such as novely, nonobviousness, and utility. While these criteria are relatively straightforward when applied to human inventions, they become more complicated when the invention is generated by an AI system. The question arises as to whether AI can engage in the kind of inventive activity that satisfies these criteria. AI systems typically operate by analyzing vast amounts of data, learning from patterns, and making predictions based on this information. As a result, the AI's "creative" process is not based on human intuition or insight, but on machine learning algorithms that mimic human cognitive functions. This difference in how AI generates inventions compared to humans has led to debates about whether the inventive process should be treated differently when the inventor is a machine rather than a person. In light of these challenges, there are numerous opportunities for legal reform that could improve the patent system's ability to handle AI-generated inventions. One opportunity is the creation of a separate category for AI-generated patents. This would allow for more tailored rules and guidelines for patenting inventions that are the product of AI systems. Such a system could accommodate the unique nature of AI-driven innovation while also addressing concerns about inventorship, patent ownership, and patent examination. Some legal scholars have suggested that a new set of rules could be developed that considers AI as a tool rather than an inventor, with inventorship attributed to the individuals or entities that use the AI to generate inventions.⁶⁴

The patentability of AI-generated inventions represents a significant challenge for patent law. As AI systems continue to play a larger role in the innovation process, the legal landscape will need to adapt to address issues of inventorship, ownership, and patent protection. While current patent law frameworks may not fully accommodate AI-generated inventions, there is potential for legal reform to better recognize and protect the intellectual property rights of those involved in creating and operating AI systems. Whether through the creation of new categories of patents or revisions to existing laws, the patent system must evolve to keep pace with the rapidly changing technological landscape.

4.2 Copyright for Artificial Intelligence-Generated Content

The rapid development of artificial intelligence has raised profound questions regarding intellectual property law, particularly in the domain of copyright. Traditionally, copyright law has been rooted in the concept of human authorship, works that are protected under copyright are the result of human

^{63 (}n 68)

 ⁶⁴ DJ Gervais, 'Artificial Intelligence and Patent Law: A New Era' Journal of Technology Law and Policy (2020) 43 55 78

creativity. With the increasing use of AI systems to generate creative works, such as visual art, music, literature, and software - these traditional principles are being challenged. The question of whether AI-generated content is eligible for copyright protection, and if so, who should be credited as the author, is at the forefront of legal discussions in many jurisdictions. This paper explores the legal challenges and opportunities surrounding the copyright for AI-generated content, focusing particularly on the issue of authorship and the need for reform in existing legal frameworks. The concept of authorship has been a cornerstone of copyright law for centuries. In both the United States and European Union, copyright is granted to the author of an original work of authorship, provided that the work is fixed in a tangible medium of expression. Under these traditional systems, the author must be a human being, as human creativity and originality are the key elements for determining the eligibility of a work for copyright protection. In the U.S., for instance, the Copyright Act⁶⁵ establishes the rights of authors of creative works, but it assumes that authorship is always attributed to natural persons. Similarly, the European Union's Directive on Copyright in the Digital Single Market echoes this view, emphasizing that the author of a work is a natural person. As such, works generated solely by AI - without direct human intervention - present a unique challenge to this established model of copyright protection. While copyright law has evolved to accommodate a range of creative works from paintings and novels to computer programs and databases - AI-generated content has introduced new complexities. Unlike traditional human authors, AI systems are not "persons" under the law and cannot hold intellectual property rights. This has led to significant debates regarding who, if anyone, should hold copyright in works generated by AI. In cases where AI systems are capable of producing novel, unique, and creative content, the question arises as to whether the system itself, the human developer of the system, or the user of the system should be the rightful owner of the copyright.

The primary legal challenge in relation to AI-generated content is the issue of authorship. As noted, copyright law has always linked authorship to human creativity, but this link is complicated when an AI system is responsible for generating the content. In situations where AI systems are the sole creators, the traditional notion of authorship becomes problematic. Should the person who developed or programmed the AI system be considered the author? What if the AI creates content autonomously, with little to no human input? These challenges highlight the need for a legal framework that recognizes the unique nature of AI as a tool used by humans to generate creative works. One possible solution is to attribute copyright to the human creator or operator of the AI system. This approach assumes that the AI system is a tool used by the human creator, rather than an independent creator in its own right. For instance, in the case of AI-generated art, the person who programmed the AI, provided the input data, or directed the creative process could be seen as the author. This approach aligns with the traditional model of authorship, in which tools are used to assist human creativity. However, the degree of human involvement required for the work to be eligible for copyright protection remains a key issue. In the case of AI-generated music, for example, if the AI system autonomously composes a song based on a set of instructions, how much human intervention is necessary for copyright protection to apply?

5.0 Conclusion and Recommendations

The rapid advancement of Artificial Intelligence in generating creative and inventive works has exposed significant gaps in traditional intellectual property laws, particularly in the areas of patents and copyright. While conventional legal frameworks have historically hinged on human authorship and inventorship, the emergence of AI-generated works raises fundamental questions about originality, ownership, and eligibility for legal protection. Judicial and legislative responses across various jurisdictions, including the United States, the European Union, and Nigeria, have largely maintained a restrictive stance by denying AI the status of an author or inventor. The rejection of AI-generated patent applications, such as in the *DABUS* case, and the refusal to grant copyright protection to

⁶⁵ S. 106

fully autonomous AI-generated works highlight the rigidity of existing laws in accommodating technological advancements. This article has examined the doctrinal and policy challenges posed by AI-generated works within the context of IP law and assessed the potential for legal reforms. It is evident that a balance must be struck between fostering innovation and maintaining the foundational principles of intellectual property rights. The need for a re-examination of IP laws is therefore imperative to ensure that AI-generated works do not exist in a legal vacuum, which could discourage investment in AI-driven innovation and create uncertainty in the creative and technological sectors.

By way of recommendations, I hereby recommend the adoption of a Hybrid Legal Framework for AI-Created Works. Given that AI is often used as a tool by human creators, a hybrid approach should be adopted in IP law. This framework should recognize AI-assisted works as eligible for protection but require human oversight or significant human contribution to qualify for authorship or inventorship. Such an approach would ensure that legal protections are extended to AI-generated works without completely disregarding the role of human creativity. Also, I recommend legislative reforms to redefine authorship and inventorship.

IP laws should be amended to explicitly define the status of AI-generated works. Legislators should consider introducing provisions that recognize AI as a contributing entity rather than an independent creator. In copyright law, this could involve attributing ownership to the developer, operator, or user of the AI system. In patent law, a similar approach could allow AI-assisted inventions to be registered under the name of the human or corporate entity responsible for deploying the AI. Furthermore, I recommend establishment of AI-specific IP policies and guidelines. Regulatory bodies such as the World Intellectual Property Organization (WIPO), national copyright offices, and patent agencies should formulate clear guidelines on AI-generated works. These policies should address issues of authorship, ownership, and enforcement while ensuring consistency across different jurisdictions. Establishing such guidelines would prevent ambiguity and provide legal certainty for innovators and creators working with AI technologies. More so, there should exist international harmonization of AI-related IP laws. This is because given the global nature of AI development, international cooperation is necessary to ensure uniformity in the treatment of AIgenerated works. Countries should work together through multilateral agreements to establish standardized principles governing AI and IP law. This will facilitate cross-border recognition of rights and prevent jurisdictional inconsistencies that may hinder technological advancement and global commerce. In conclusion, while existing IP laws remain largely inadequate in addressing the complexities of AI-generated works, proactive legal reforms and policy innovations can bridge this gap. By adopting a balanced approach that preserves human oversight while acknowledging AI's growing role in creation and invention, IP law can evolve to accommodate the realities of technological advancement.