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AI AUTHORSHIP/INVENTORSHIP THROUGH THE LENS OF THEORETICAL JUSTIFICATIONS OF INTELLECTUAL PROPERTY RIGHTS.

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Abstract

The role of intellectual property (IP) law in incentivising innovation through the protection of the creations and inventions of the human intellect cannot be overemphasized. Artificial intelligence (AI), as an emerging technology, has had a significant impact on practically all sectors of society, including the field of intellectual property law. Its impact is felt in various fields of intellectual property law, such as patents, copyrights, trademarks, designs, and image rights, among others. AI is increasingly testing the limits and provisions of national and international intellectual property laws. In recent times, the IP laws on authorship, creation, and inventorship, in particular, have been re-examined in the light of AI-generated works and the question of whether AI (a non-human entity) can be recognized as such for its creations, which are potentially protectable by IP Laws. This paper will examine the intersection of artificial intelligence (AI) and intellectual property rights. It examines whether AI authorship or inventorship can be supported by the theoretical justifications of intellectual property protection. Can these justifications be used to advance the legal recognition and protection of AI as an inventor, author or otherwise?

Keywords: Artificial Intelligence, Copyright, Patents, Trademarks, Legal Personality,.

1. INTRODUCTION

The term 'intellectual property' (IP) is a generic term reported to have come into regular use in the twentieth century.[1] Peter Drahos notes that this generic term commonly refers to a group of legal regimes, each of which, to different degrees, confers rights of ownership in a particular subject matter.

Article 2 of the Convention Establishing the World Intellectual Property Organization (as amended on September 28, 1979) defines intellectual property thus:

> "intellectual property" shall include the rights 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.

The traditional core of IP generally consists of copyright, patents, designs, trademarks and protection against unfair competition.[2] Copyright protects various 'original forms of expression, including novels, movies, musical compositions, and computer software programs.[3] Patent law protects inventions and qualified discoveries; trade mark law protects words, symbols, colours or generally

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[1] Peter Drahos, 'The Universality Of Intellectual Property Rights: Origins And Development' (World Intellectual Property Organization) <www.wipo.int/edocs/mdocs/tk/en/wipo_unhchr_ip_pnl_98/wipo_unhchr_ip_pnl_98_1.pdf> accessed 13 October 2023.

[2] ibid

[3] William Fisher, 'Theories of Intellectual Property' Harvard Law School <https://cyber.harvard.edu/people/tfisher/iptheory.pdf> accessed 13 October 2023; William Fisher, "Theories of Intellectual Property" in Stephen Munzer (ed) *New Essays in the Legal and Political Theory of Property* (Cambridge University Press, 2001)

any distinctive mark that distinguishes goods and services supplied by a particular individual or business entity, while trade-secrets protect commercially valuable information that companies attempt to conceal from their competitors. Apart from these IP rights, there are other areas of intellectual property rights, like geographical indications, image rights and character merchandising, traditional knowledge and traditional cultural expressions.

Artificial intelligence (AI) is a concept that is relevant to the scope of IP rights. This is because, in relation to IP law, the outputs of AI are commonly witnessed in areas like copyrights and patents.[4] The creations and inventions made wholly by AI or in collaboration with their human creators are potentially subject to IP law.[5] However, the current position of IP law on AI generated works lacks certainty with there being very little legal acknowledgement or recognition of nonhuman copyright. Most municipal laws only recognize human authorship. In relation to patents, there exists no recognition for AI inventorship because the existing national and international patent laws do not contemplate AI inventorship. The lack of intellectual property protection for AI -generated works can be attributed to the human-oriented theoretical justifications for intellectual property. This is the pertinent issue which this paper seeks to examine and make findings as to whether there exists any theoretical justification for intellectual property that can avail AI-generated works.

Part one is the introductory aspect, while part two will undertake a conceptual clarification of AI by looking at the definition and types of AI as well as associated concepts. Part three will examine the theoretical justifications for IP protection, to determine if they support or contradict the recognition of AI inventorship or authorship. The paper concludes in part four with recommendations being proffered that can advance the protection of AI works by intellectual property works law.

[4]Lawrence Oguama, 'Intellectual Property and Artificial Intelligence: Emerging Prospects and Challenges' (2022) SSRN, 5 <https://dx.doi.org/10.2139/ssrn.4046151> accessed 1 June 2023

[5]Mauritz Kop, 'AI & Intellectual Property: Towards an Articulated Public Domain' *Texas Intellectual Property Law Journal* [2020] 28 (x) 297 and 300.

2. ARTIFICIAL INTELLIGENCE

The term ‘artificial intelligence’ was first used at a conference in 1956 by John McCarthy, a computer scientist.[6] There is no generally accepted definition of artificial intelligence (‘AI’) however, several definitions have been advanced in explaining what AI is. AI may be described as a non-human system that possesses cognitive functions and skills such as learning and reasoning.[7] It has been defined as a system capable of performing tasks that would normally require human intelligence, such as recognition, decision-making, creation, learning, evolving, and communicating.[8] Also, it is a discipline of computer science that is aimed at developing machines and systems that can carry out tasks considered to require human intelligence, with limited or no human intervention.[9] Perhaps the best definition is the Turing Test proposed by Alan Turing. Turing proposed a test called the ‘imitation game’, based on which AI could be defined as follows:

> "Artificial intelligence" means any computer that passes the Turing test.
>
> "Turing test" means a game which is played with three participants: (1) a human, (2) a computer and (3) a human judge. The human judge is separated from the other two participants. They can only communicate via text. The Turing test is passed if the human judge cannot effectively discriminate between the human and the computer.”[10]

Turing’s test sought to prove that a machine could exhibit intelligence that was indistinguishable

[6] Swapnil Tripathi and Chandni Ghatak, ‘Artificial Intelligence and Intellectual Property Law’ *Christ University Law Journal* (2018) 7 (x) 83, 84.
[7] Mauritz Kop (n5) 300.
[8] Shlomit Yanisky-Ravid (n6) 673
[9] WIPO Secretariat, 'Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence' [WIPO Conversation on Intellectual Property (IP) And Artificial Intelligence (AI), Second Session May 2020] 3 < https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1_rev.pdf > Accessed 11 November 2023
[10] Jonas Schuett, ‘A Legal Definition of AI’ (ResearchGate, 2019) 3 <https://www.researchgate.net/publication/336198524_A_Legal_Definition_of_AI> accessed 18 November 2023

from a human being.[11] However, there are those who doubt that artificial intelligence can equal human intelligence. A notable view is Professor G. Jefferson's argument in 1949 which states thus:

> Not until a machine can write a sonnet or compose a concerto because of thoughts and emotions felt, and not by the chance fall of symbols, could we agree that machine equals brain[12]

This argument has been negated with recent developments. For instance, in the 1990s, computers were capable of producing works of originality. The book 'The Policeman's Beard is Half Constructed' was written by Racter, a computer program created to produce poetry and prose. The 'new Rembrandt', an artwork was created by AI[13] and then AI generated a song called 'Heart on My Sleeve' by cloning the voices of Drake and The Weeknd.[14] The song was removed from streaming platforms in reaction to complaints by the artistes' record label, Universal Music Group. Nevertheless, in 2023, this song was still nominated for Grammys consideration in the categories of Best Rap Song and Song of the Year.[15] Following this, Harvey Mason Jr, CEO of the Grammys declared that music compositions with AI-generated parts will now be eligible for recognition, marking the introduction of AI into the esteemed music awards.[16] However, Harvey noted that the AI element of the work will not be taken into consideration; only the sections produced by humans

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[11] Dustin J. Corbett, 'A Premier Paradigm Shift: The Impact of Artificial Intelligence on U.S. Intellectual Property Laws' *17 Liberty University Law Review* (2023) (x) 322 and 356.

[12] ibid

[13]Christina Campbell, 'The Next Rembrandt: Originality and Authorship of AI Generated Works' *Science and Technology Law Review* (31 October 2017) <https://journals.library.columbia.edu/index.php/stlr/blog/view/176> accessed 19 November 2023; Chris Baraniuk, "Computer paints 'new Rembrandt' after old works analysis" *BBC* (London, 6 April 2016) <www.bbc.com/news/technology-35977315> accessed 19 November 2023

[14] Mark Savage, 'AI-generated Drake and The Weeknd song goes viral' *BBC* (London, 17 April 2023) <www.bbc.com/news/entertainment-arts-65298834>

[15] Melissa Ruggieri, 'The AI-generated song mimicking Drake and The Weeknd's voices was submitted for Grammys' USA Today (September 6, 2023) <www.usatoday.com/story/entertainment/music/2023/09/06/ghostwriter-drake-the-weeknd-song-submitted-grammy-awards/70779575007/> accessed 19 November 2023

[16] Anthony Udugba, 'Grammys: AI-created elements now eligible for awards' Business Day (Lagos, 6 July 2023) <https://businessday.ng/life-arts/article/grammys-ai-created-elements-now-eligible-for-awards/> Accessed 19 November 2023.

will.[17] This refusal to award recognition to AI-generated works adds to the much larger discourse on AI authorship and inventorship.

In *Thaler v Perlmutter*[18] Mr Thaler developed an AI program called 'the creativity machine' and it produced an artistic (visual) work. Mr. Thaler in his copyright application submitted to the US Copyright Office, identified the AI program as the copyright author and himself as the copyright owner. The US Copyright Office denied his application on the basis that copyright only avails works made by human beings. Thaler challenged the decision of the US Copyright Office at the United States District Court for the District of Columbia. The court affirmed the decision of the US copyright Office on the grounds that there was no human involvement as required by the US Copyright Act of 1976.

AI has been classified in various ways. We shall however focus on classifications that reflect the level of intelligence of the AI since the focus of this study is an examination of the legal personality of an AI.

Reactive Machines: Reactive machines do not form memories or apply their past experiences in handling tasks and situations, thus making them the most basic form of AI.[19] They have no consciousness or sense of the environment so they merely perform the simple tasks they were programmed for, without any change or development.[20] An example is the Deep Blue, a chess-playing AI system run on International Business Machines computer.

Limited Memory: Limited memory systems use past data to make informed future decisions in line with pre-programmed data.[21] Virtually all modern AI applications are limited memory systems,

[17] ibid
[18] Case No. 1:22-cv-01564-BAH (United States District Court for The District of Washington D.C)
[19] Fran Škavić, *The implementation of artificial intelligence and its future potential* (B.Sc. thesis, University of Zagreb 2019) 12.
[20] ibid.
[21] ibid, 13.

with autonomous vehicles being an example of such.[22] Limited memory systems utilize deep learning which works by feeding the computer large amounts of information, which is then analysed and used in creating knowledge.

Artificial Narrow Intelligence (ANI): ANI, also called weak intelligence, focuses on a specific task. As a result of their narrow focus, they are used to perform solely those tasks. They operate autonomously and much better than humans. Examples of weak AI include autonomous vehicles and Apple's Siri.[23]

Artificial General Intelligence (AGI) is still non-existent; however, machines possessing AGI are expected to function the way humans do and possess the capacity for learning and understanding. AGI-endowed machines are also expected to possess consciousness and emotions, they would be required to pass the Turing Test described above.[24]

Artificial Superintelligence (ASI): ASI is the highest form of AI, and it is expected to be the most advanced form of intelligence on earth. ASI will be able to imitate the multi-disciplinary intelligence possessed by humans as well as perform better than humans on tasks because of its superior capabilities such as decision-making, data processing and memory.[25]

At this juncture, some pertinent questions come to mind, such as: what is AI? How does AI work? Does the AI system follow the process of human perception?[26] Firstly, the AI algorithm is presented with multiple examples and their classifications. Secondly, the algorithm breaks down the data into minute electronic signals which humans cannot detect. The AI system further tries to identify hidden patterns, connections or similarities. Thirdly, the AI system improves with experience and continues to evolve in line with the new data the system is fed, or it finds on its

[22] ibid.
[23] ibid, 8.
[24] ibid, 10
[25] ibid, 11.
[26] Shlomit Yanisky-Ravid, 'Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era--The Human-like Authors are Already Here- A New Model' *Mich. St. L. Rev*. (2017) (x) 659, 676

own.[27]

3. THEORETICAL JUSTIFICATIONS OF INTELLECTUAL PROPERTY PROTECTION FOR AI-GENERATED WORKS

Certain theories have been advanced as justification for the protection of intellectual property rights. These theories have been largely grouped into two broad categories, namely, the economic and moral justification theories.[28] These theories will be discussed with regard to AI-generated works, albeit it is important to state that these theories rely on the assumption that humans are the sole and anticipated creators or inventors of a work subject to intellectual property protection.[29] This is so because they originate from a time when AI was neither in existence nor contemplated.[30]

The starting point is the moral justification for the protection of intellectual property rights, which can be divided into labour and personality theories.[31] The labour theory can be further divided into the natural rights and reward theories. These theories and others are discussed below.

3.1 Natural Rights Theory.

The natural rights theory posits that a creator or innovator has an inalienable right of ownership to property created through his or her intellectual efforts.[32] According to the principles of natural law

[27] ibid 677

[28] Desmond Oriakhogba and Ifeoluwa Olubiyi, *Intellectual Property Law in Nigeria; Emerging Trends, Theories and Practice* (Paclerd Press Limited, 2021) 7

[29] Isabella Lorenzoni, 'Artificial Intelligence creates, invents … and challenges Intellectual Property Law AI: the mind behind creative and innovative works. Can a sui generis system be a solution?' *Stockholm Intellectual Property Law Review* (2020) (x) 26 and 28.

[30] Reto M. Hilty, Jörg Hoffmann and Stefan Scheuerer, 'Intellectual Property Justification for Artificial Intelligence' (2020) Max Planck Institute for Innovation and Competition Research Paper No. 20-02, 6 <https://ssrn.com/abstract=3539406> accessed 19 November 26, 2023

[31]Desmond Oriakhogba and Ifeoluwa Olubiyi, (28) 8

[32] ibid; Mikhalien du Bois 'Justificatory Theories for Intellectual Property Viewed through the Constitutional Prism' *PER / PELJ* [2018] 21 (x) 1 and 7 <http://dx.doi.org/10.17159/1727-3781/2018/v21i0a2004> Accessed 11 July 2023

theory, property rights are not considered as independent or primary concepts, but rather as derived from more fundamental and universal moral principles.[33] The natural rights theory posits that intellectual property is the corollary of such a creator or inventor's efforts. Therefore, the law only acts to uphold intellectual property rights as existing rights.[34]

Certain legal scholars have noted that the natural rights theory is inapplicable to the protection of AI-generated outputs on certain grounds. One such ground arises in the area of patents, where it has been argued that because human beings are not involved in the 'automated' invention process, it is theoretically expected to be more convenient and cost-effective for a company to engage in inventing.[35]

It was also argued that the amount of money spent on developing an invention could influence the likelihood of obtaining a patent. Essentially, the more money invested in creating the invention, the easier it might be to secure patent protection. This is because a patent can help recover the initial investment..[36] In matters of copyright, AI-generated works face the hurdle of originality as prescribed by relevant national laws and international treaties.[37] In *University of London Press v University Tutorial Press*[38] the court in construing the meaning of originality under the UK Copyright Act, 1911 had held that the UK Copyright Act did not require that the work must be in an original form, but that such work must not be copied from another work, it should originate from the author. It is important to note that there are two schools of thought on the interpretation of the test of 'originality' in works subject to copyright protection.[39] The objective school is also known as the 'sweat of the brow' or

[33]Gary Chartier, 'Intellectual Property and Natural Law' *Australian Journal of Legal Philosophy* [2011] (x) 36, 59 http://classic.austlii.edu.au/au/journals/AUJlLegPhil/2011/1.pdf Accessed 11 July 2023
[34] Desmond Oriakhogba and Ifeoluwa Olubiyi, (28) 8
[35]Mauritz Kop, (n5) 313
[36] ibid
[37] See section 2(2)(a) of the Nigerian Copyright Act 2022
[38] [1916] 2 Ch. 601 at 608.
[39] Desmond Oriakhogba and Ifeoluwa Olubiyi, (n28) 137

'industrious collection' school.[40] This school of thought postulates that sufficient industry, labour or skill must have been expended to endow the work with originality.[41] The other school of thought, that is, the subjective or creativity school, asserts that in determining originality, there must be a finding of the author's personality in the work.[42] Some proponents of this school of thought have further held that finding originality is impossible in the absence of creativity thus, there must be an element of creativity present in the work to endow such work with originality.[43] This requirement of creativity constitutes a hurdle that AI cannot currently overcome as it has been noted that AI-generated works often lack creativity.[44] Even in cases where it could be said that AI exhibits creativity, the argument is that AI is not an autonomous creative agent but is merely a faithful agent.[45] AI systems largely depend on programmers and developers as well the data fed to it by humans in training intelligent algorithms.[46] AI can only produce output based on the source data and initial instructions it received.[47] Thus, until AI is granted legal status possibly as a subject of legal relations, then AI cannot be said to be an autonomous creative agent.

3.2 The Reward Theory.

The moral justification of IP protection vis-à-vis the reward theory derives from libertarianism.[48] The reward theory asserts that creators or inventors deserve to be rewarded for their intellectual labour,

[40] ibid, 138
[41] ibid, 138
[42] ibid, 139
[43] ibid
[44] Sascha Brodsky, 'AI Is Writing Books Faster Than Humans—Here's Why That's a Problem' *Lifewire Tech for Humans* (New York 23 February 2023) <https://www.lifewire.com/ai-is-writing-books-faster-than-humans-heres-why-thats-a-problem-7113062> Accessed 10 July 2023
[45] Mauritz Kop, (n5) 304
[46] Hayleigh Bosher and others, 'WIPO Impact of Artificial Intelligence on IP Policy Response from Brunel University London, Law School & Centre for Artificial Intelligence' 14 <https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/org_brunel.pdf> accessed 13 November 2023
[47]ibid
[48] Theodoros Papaioannou, 'Can Intellectual Property Rights be Morally Justified? The Case of Human Gene Patents' Dynamics of Institutions and Markets in Europe (DIME Working Papers on Intellectual Property Rights, No 8 March 2006) 10

and thus, IP protection is a just reward for their intellectual efforts.[49] Creators or inventors are viewed as persons who provide socially beneficial goods and merit some form of compensation.[50] Creators and inventors are acknowledged by society and given incentives through a legal right that allows them to prevent others from using their IP works in specific ways when making those works available to the public.[51] The reward theory validates the rationale of IP laws in promoting the dissemination of information.[52] Thus, patents, copyright and industrial design rights that seem to meet this requirement. seem to be justified by the reward theory.[53]

The reward theory played a key role in the patent controversy that occurred in the 19th century.[54] Reward lies at the core of patent law as it aims at incentivizing the innovative acts of inventors.[55] Thus, the reward theory functions as an incentive for technological advancements and their disclosure.[56] This element of incentives poses a challenge to the granting of intellectual property protection to AI-generated works because AI is not a sentient being that is capable of responding to intellectual property incentives in the way humans would.[57] AI does not need incentives or rewards to create; thus, it fails to qualify for a key requirement of intellectual property protection, that is, reward.[58]

3.3 Labour Theory

[49] ibid
[50] Desmond Oriakhogba and Ifeoluwa Olubiyi, (n28) 8
[51] Mikhalien du Bois (n32), 19.
[52] ibid, 21.
[53] ibid, 20.
[54] Theodoros Papaioannou, (n48) 10.
[55]Hayleigh Bosher and others (n46), 6.
[56] Seth A. Cohen, 'To Innovate or Not to Innovate, That Is the Question: The Functions, Failures, and Foibles of the Reward Function Theory of Patent Law in Relation to Computer Software Platforms' *Mich. Telecomm. & Tech. L. Rev* (1999) 5 (1), 4.
[57] Senftleben Martin and Buijtelaar Laurens, 'Robot Creativity: An Incentive-Based Neighboring Rights Approach (SSRN, October 1, 2020) 14 http://dx.doi.org/10.2139/ssrn.3707741 accessed 13 June 2023.
[58] Yurii Burylo, 'AI-generated works and copyright protection' *Entrepreneurship, Economy and Law* (2022) 3 (x)7and 10 <doi: https://doi.org/10.32849/2663-5313/2022.3.01>

The labour theory can be traced to John Locke's Second Treatise of Government.[59] Labour theory presupposes that people can have rights of ownership accruing over private property because of the work or efforts expended in creating or realizing such property.[60] The essence of the labour theory is that a person is entitled to the product of his intelligence, effort and perseverance.[61] Article 27(2) of the Universal Declaration of Human Rights (UDHR) and Article 15(1)(c) of the International Covenant on Economic, Social and Cultural Rights seem to corroborate the position of enjoying the ideal of enjoying the fruits of one's labour. The labour theory does not align with the intellectual property protection for AI-generated works.[62] This is due to two pertinent factors, which are the lack of personhood and the uncertain nature of the effort expended by AI in producing the outputs.

3.4. Personality Theory

The personality theory posits that creating intellectual property and putting it in the public domain is an expression of one's personality. This theory traces its roots to the philosophy of Georg Wilhelm Friedrich Hegel and was known to be advocated by Otto von Gierke.[63] The theory is known to be particularly relevant in copyright due to artistic works being significantly influenced by the personality of the artist/artiste creating such artistic work.[64] In relation to AI-generated works, the personality theory cannot be used to justify intellectual property protection due to one key reason,

[59] Mikhalien du Bois (n32), 8.
[60] Reto M Hilty, Jorg Hoffmann and Stefan Scheuerer, 'Intellectual Property Justification for Artificial Intelligence' in Jyh-An Lee, Reto M Hilty and Kung-Chung Liu (eds), *Artificial Intelligence and Intellectual Property* (Oxford University Press 2021) 52
[61] Mikhalien du Bois (n32), 8.
[62] Bonadio Enrico and McDonagh Luke, 'Artificial Intelligence as Producer and Consumer of Copyright Works: Evaluating the Consequences of Algorithmic Creativity' (2020) SSRN, 3 https://ssrn.com/abstract=3617197 accessed 12 June 2023; Bonadio, Enrico and McDonagh, Luke, Artificial Intelligence as Producer and Consumer of Copyright Works: Evaluating the Consequences of Algorithmic Creativity (June 2, 2020). Intellectual Property Quarterly 2020, 2, pp. 112-137, Available at SSRN: https://ssrn.com/abstract=3617197
[63] Reto M. Hilty, Jörg Hoffmann and Stefan Scheuerer, (n30) 5.
[64] ibid

which is, the absence of consciousness or a personality on the part of AI systems.[65] AI merely expresses the will of humans.[66]

The importance of personality as a basis for intellectual property protection was expressed by the court in *Eva-Maria Painer v Standard VerlagsGmbH and Others*[67] thus:

> Article 6 of Directive 93/98 must be interpreted as meaning that a portrait photograph can, under that provision, be protected by copyright if, which it is for the national court to determine in each case, *such photograph is an intellectual creation of the author reflecting his personality and expressing his free and creative choices in the production of that photograph.*

In relation to inventions, the concept of inventorship is skewed towards a human inventor and the courts in determining when an invention was made and by whom, try to focus on the ideas happening in the inventor's mind.[68] This certainly is a practical problem for the courts as AI has no mind or consciousness for the court to assess.

3.5 Utilitarian Theory

The utilitarian theory as applied to the justification for the protection of AI-generated works by intellectual property law uses economic concepts to explain how IP rights can actualise the principle espoused by Jeremey Bentham, which is that, the law should be used for the achievement of the greatest good for the greatest number.[69] In relation IP rights, the utilitarian theory holds that intellectual property is justified only if it increases social welfare.[70] Brian L. Frye states that 'Intellectual property both increases welfare by encouraging marginal innovators to invest in

[65] Mauritz Kop, (n5) 303.
[66] Reto M. Hilty, Jörg Hoffmann and Stefan Scheuerer, (n30) 6 and 7.
[67] ECLI:EU:C: 2011:798
[68] Hayleigh Bosher and others, (46) 6.
[69] Neil Wilkof, 'Theories of intellectual property: Is it worth the effort?' *Journal of Intellectual Property Law & Practice* (2014) 9(4), 257
[70] Brian L. Frye, 'Machiavellian Intellectual Property' *Univ. of Pittsburgh L. Rev.* (78) 1 (2016) 4; Brian L. Frye, Machiavellian Intellectual Property, 78 Univ. of Pittsburgh L. Rev. 1 (2016) 4; Frye, Brian L., "Machiavellian Intellectual Property" (2016). Law Faculty Scholarly Articles. 584. https://uknowledge.uky.edu/law_facpub/584

innovation and decreases welfare by discouraging marginal innovators and consumers from using innovations protected by intellectual property.'[71]

Its focus is on balancing the social costs and benefits associated with enforcing IP laws.[72] It advocates for a limited duration of rights in order to 'balance the social welfare loss of monopoly exploitation.'[73] In relation to this view, Jeremey Bentham theorised thus:

> [T]hat which one man has invented, all the world can imitate. Without the assistance of the laws, the inventor would almost always be driven out of the market by his rival, who finding himself, without any expense, in possession of a discovery which has cost the inventor much time and expense, would be able to deprive him of all his deserved advantages, by selling at a lower price.[74]

The utilitarian theory presupposes that the grant of IP rights should be done with the objective of fostering the greatest good for the greatest number of people in society.[75] Therefore, in the formulation of IP policy, policymakers should try to maintain an equilibrium between the exclusive rights granted on the one hand to holders of IP rights to stimulate creativity and innovation and the set of rights accruing to the public not to restrict access to knowledge.

The theory posits that without IP protection, authors and investors would be unwilling to invest their resources in creating or inventing intellectual property works and the society would be at a

[71] ibid
[72] ibid
[73] Peter S. Menell, Intellectual Property: General Theories <https://reference.findlaw.com/lawandeconomics/1600-intellectual-property-general-theories.pdf> page 129
[74] ibid
[75] Reem Anwar Ahmed Raslan, 'Re-examining the Public Interest Component of IPRs With Special Reference to Plant Breeders' Rights' WIPO-WTO Colloquium Papers, 2013, page 18 <https://www.wto.org/english/tratop_e/trips_e/colloquium_papers_e/2013/chapter_3_2013_e.pdf>

disadvantage.[76] Therefore, the law tries to forestall this by conferring quasi-monopolistic rights on authors and inventors with respect to their intellectual property.[77]

This theory is somewhat inapplicable when applied to the concept of AI-generated works because requirements like creativity and innovation are not needed by AI to create or invent things. However, when one considers that the outputs of AI can benefit a large section of society in many ways then it would seem that in relation to AI-generated works or inventions, IP protection is justified since it increases social welfare.[78] To buttress this point, the role of AI in daily human existence is pervasive as we see AI being used in a wide variety of contexts such as mapping or navigation apps, spell checkers, personalized feeds on social media platforms , news filtering etc.[79]

Also, a generative model was developed by researchers at Harvard University, the University of Toronto, and the University of Cambridge and it was trained on 250,000 drug-like molecules. The AI was able to generate pharmacological molecules without the need for lengthy simulations and more independently of humans.[80] The sheer speed at which AI-system can process data and churn out results compared to a human, is something that would certainly benefit society in the area of science, technology, engineering and medicine—not to mention mathematics. The utilitarian theory therefore favours the protection of AI works.

3.6 Economic Incentive Benefit Theory

[76]Rosa Maria Ballardini, Janne Kaisto and Jukka Simila, 'Developing novel property concepts in private law to foster the circular economy' *Journal of Cleaner Production* (2021) 279 1) (123747) 4
[77] ibid
[78] Brian L. Frye, (n70)‘ 4
[79] Randi L. Karpinia, 'Intellectual Property Rights of Artificial Intelligence Inventors' American Intellectual Property Law Association (n.d.) <https://www.aipla.org/list/innovate-articles/intellectual-property-rights-of-artificial-intelligence-inventors> Accessed February 29 2024
[80] Nigel Cory and Daniel Castro, 'RE: Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation (Federal Registry Notice 84 FR 58141)’ Information Technology and Innovation Foundation (n.d.) 7 <https://www.uspto.gov/sites/default/files/documents/ITIF_RFC-84-FR-58141.pdf> Accessed February 29 2024

This theory posits that IP protection is essential to motivate authors and inventors.[81] The absence of IP protection engenders a spate of unjust enrichment activities by free riders, which will further act as a disincentive to authors and inventors to create and/or invent.[82] As a corollary, the theory contends that the conferment of IP rights is a precondition for the creation of IP, and this will lead to economic development. Proponents of the free-market economics theory favour the economic incentive benefit theory. The theory is founded on the assumption that IP is created for the purpose of profit maximisation.[83] As has been noted by the Information Technology and Innovation Foundation, AI systems may not respond to economic incentives, but the developers and owners of AI systems certainly do.[84] It is therefore necessary for IP laws and policies to recognise non-human creativity and innovation, as well as make guidelines that clearly distinguish rights that accrue to human and non-human creativity and innovation. IP laws and policies may be reviewed to recognise AI processes and outputs as trade secrets capable of IP under the law in order to safeguard the economic interests of the developers and owners of AI systems.[85]

3.7 Development Theory

The development theory is also known as the social planning theory, and it perceives intellectual property as a means to an end: the end being technological and national development.[86] William Fisher notes that the underlying principle of the social planning theory is to foster a 'just and

[81] ---- MIP 101 General Introductions to IP Rights (A Lecture note prepared for students of the school of law, Indira Gandhi National Open University) Page 31
[82] ibid
[83] ibid
[84] Nigel Cory and Daniel Castro, (n80).
[85]Robert A. McFarlane, 'Protecting artificial intelligence requires arsenal of intellectual property laws' Reuters (March 31, 2023) <https://www.reuters.com/legal/legalindustry/protecting-artificial-intelligence-requires-arsenal-intellectual-property-laws-2023-03-31/> Accessed 29 February 2024; Frank A. DeCosta III, 'Intellectual Property Protection for Artificial Intelligence' Westlaw Journal Intellectual Property (August 30, 2017) <https://www.finnegan.com/en/insights/articles/intellectual-property-protection-for-artificial-intelligence.html> Accessed 29 February 2024; Flavius Florea. 'Artificial intelligence and the future of IP rights' WolfTheiss (6 September 2022) <https://www.wolftheiss.com/insights/artificial-intelligence-and-the-future-of-ip-rights/> Accessed 29 February 2024
[86] Desmond Oriakhogba and Ifeoluwa Olubiyi, Intellectual Property Law in Nigeria; Emerging Trends, Theories and Practice (2nd edition, Paclerd Press Limited, 2023) 11

attractive culture'.[87] He also stated that the theory is premised on the social fact that 'people's nature causes them to flourish more under some conditions than others, and that social and political institutions should be organized to facilitate that flourishing'.[88] He noted that the crux of this theory is to ask what kind of society should legislators and policymakers try to promote through the amendment of intellectual property laws and rights?[89] In trying to resolve this question, William Fisher posits that a just and attractive culture would have to satisfy the following essentials:[90]

- Consumer Welfare: This involves using intellectual property rights to create a fair and appealing culture by implementing rules that enhance consumer welfare. This is achieved by balancing the incentives for spreading and using information..[91]
- A Wealth of Knowledge and Insights: A just and attractive culture is typified by the citizens' enjoyment of access to a wide variety of information and ideas. It is believed that this, in turn, causes life to be entertaining, enjoyable and invigorating.
- A Vibrant Cultural Heritage: Fisher believes that creativity and subtlety in communication and thought, to an extent, is based on the degree of complexity and nuances of the shared language of a culture.
- Distributive Justice: The principle of distributive justice is concerned with the allocation of values amongst a class of people, with such values consisting of rights, goods, services, etcetera.[92]

[87] William Fisher, (n3) 6.
[88] William W. Fisher III, 'When Should We Permit Differential Pricing of Information?' UCLA Law Review (2007) 55 (1) 33
[89] ibid, 22.
[90] William Fisher, (n3).
[91] ibid, 22-23.
[92] The Open University, Rights and justice in international relations (a lecture note designed and edited by The Open University, 2019) 17

- Semiotic Democracy: John Fiske coined the term ‘semiotic democracy’ to describe a world where people had the freedom to use cultural symbols in response to media.[93] Briefly put, a semiotic democracy allows the audience to push back, change, and reinterpret cultural symbols in ways that go against what the creators originally meant thus, empowering the consumers as against producers.
- Sociability: Fisher believes that one attribute of an attractive society is that it has rich trove of memories and that the ability of individuals to attain a beneficial existence can be facilitated by their access to a variety of "constitutive groups."[94]
- Respect: According to Fisher, respect for the intellectual property of others arises when people appreciate that self-expression is a form of self-creation.[95]

Critics have noted that the social welfare theory is “an eclectic cluster of political and legal theorists” that cannot achieve consensus on what its goals are and, as a consequence, is inadequate.[96]

In relation to the use of AI, it would appear that the social planning theory might justify the call for authorship and invention. As previously noted in utilitarian theory, the outputs of AI can benefit society and increase social welfare. Thus, it is not inconceivable to think that AI can be used to foster a just and attractive culture, especially with regard to consumer welfare and distributive justice tenets, as AI can be a leveller in the distribution of intellectual property goods to both the privileged and underprivileged members of society. An example is how platforms like Netflix use AI algorithms to recommend content to users, making diverse forms of entertainment accessible to a broader audience.[97] Another example is how translation services like Google Translate, which are powered by

[93] Sonia K. Katyal, ‘Semiotic Disobedience’ Washington University Law Review (2006) 84 (3) 490
[94] William Fisher, (n3) 35.
[95] ibid.
[96] Neil Wilkof, (69) 257.
[97] Neil Sahota, ‘Streaming Into The Future: How AI Is Reshaping Entertainment’ Forbes (March 18, 2024) < https://www.forbes.com/sites/neilsahota/2024/03/18/streaming-into-the-future-how-ai-is-reshaping-entertainment/?sh=179427443056 >

AI help in making texts in foreign languages available to readers who are not ordinarily versed in the language of expression.[98]

4. CONCLUSION

In summary, save for the development (social planning theory) and utilitarian theories, the various theoretical rationales for the protection of intellectual property would likely not support the protection of AI-generated works by IP law or its legal recognition as an inventor, author or creator of such works. Most of these theories were proposed to protect human authors/inventors/creators. To that extent, any theory proposed would only serve to further intellectual property protection for the human being behind the AI.[99] Of the theories discussed, the utilitarian, development and economic incentive theories may be stretched to protect AI works and recognise AI creativity for the development of society and its economic advancement. However, the question still arises whether AI needs an incentive to contribute to the welfare of society as well as its economic and general development. At the end of it all, it is the human beings developing and making use of the AI system that need to be incentivised to do more for the benefit of society and not the machine itself.

Hence, the protection of AI works by intellectual property works can be encouraged or done but mainly to protect, reward and incentivise the human who programs or makes use of the AI, not the AI in itself. To do this, there must be a paradigm shift in intellectual property jurisprudence, with scholars looking beyond anthropomorphic considerations in advocating for intellectual property recognition and protection of AI works and inventions.

[98] Shlomit Yanisky-Ravid and Cynthia Martens, 'From the Myth of Babel to Google Translate: Confronting Malicious Use of Artificial Intelligence— Copyright and Algorithmic Biases in Online Translation Systems' *Seattle University Law Review* (2019) 43 (99) 103

[99] Reto M. Hilty, Jörg Hoffmann and Stefan Scheuerer, (30) 9.