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AI-GENERATED OR AI-AIDED? EXAMINING PATENTABILITY, INVENTORSHIP AND POLICY IMPLICATIONS OF AI INVENTIONS

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ABSTRACT

The research paper explores the evolving role of AI in the field of inventions, particularly focusing on the distinction between autonomous AI inventions and those aided by AI. As AI has now transformed from a tool in computational programming in computer systems to be a touch bearer in various fields, it has raised questions regarding the inventorship of AI inventions. Recent debates, highlighted by cases like the European Patent Office's (EPO) rejection of DABUS as an inventor, underscore the lack of clear definitions and understanding in differentiating automation from autonomy within AI systems. This research examines the technical and legal implications of AI's role in inventorship, considering issues of autonomy, the technical functionality of AI-generated inventions, and the policy challenges that arise. By analysing perspectives of the U.S., UK, Australia and E.U., this paper aims to clarify the technicality of AI inventions to aid understanding, in order to simplify the debate in adapting to policy frameworks for AI inventions. By comparing international perspectives and providing an analysis of patent law's suitability for AI-generated outputs, the paper underscores the importance of balancing patent protection for AI-generated inventions with public domain preservation. Ultimately, it addresses whether our current legal landscape is capable of accommodating AI inventions and suggests a path forward.

Key Words: Artificial Intelligence, AI-Generated Inventions, DABUS, Automation, Autonomy, Inventorship, Patent Law

I. ABOUT THE ARTICLE

This study was conducted using doctrinal research methodology. The primary sources of research comprise statutes, legislation, and acts, while the secondary sources include research journals, articles, blogs, and various other data sources essential for conducting a comprehensive study. The scope of this research paper is to examine the patentability of AI inventions by focusing on the distinction between autonomous and automated processes, and between AI-generated and AI-assisted outputs. This paper will correlate the technical capabilities of AI with the existing criteria of patentability to address the problem statement, but only to the extent necessary.

In the initial stages of investigating this topic, the researcher posits that there exists a significant gap in the technical understanding of this subject, which serves as an impediment to innovation. However, the research aims to elucidate the rationale behind the failure to distinguish between automation and autonomy in AI inventions and to determine whether an AI invention is eligible for patent licensing. Additionally, the primary objectives of the author are to comprehend what constitutes an AI invention and its associated technicalities. This can be accomplished through a clear delineation between AI-generated and AI-aided inventions. This study will additionally present recommendations for policymakers concerning

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artificial intelligence invention patent licensing.

II. INTRODUCTION

Recently, AI has evolved beyond its role as a tool for computer systems. There are various examples across diverse fields worldwide. However, one of them is the recent development of the growing popularity of AI influencers on various social media platforms, who not only have an account but have also recently been getting papped with celebrities and have been doing brand endorsements. Surprisingly, they are upright competitors to human social media influencers[719]. The question that is to be pondered is whether AI can function by itself, that is, autonomously, or whether it still needs human intervention and inputs. This became a discussion after the European Patent Office (EPO) rejected two patent applications that had designated DABUS, an AI system as the inventor. This decision was based on the European Patent Convention, which mandates that the inventor be a human[720].

AI inventions have become a hot topic and have gained surface in the agendas of international forums and policymaking bodies, sparking numerous academic and non-academic discussions. Following the DABUS application rejection, the World Property Organization (WIPO) issued a call for comments on how patent laws and policies should respond to inventions that are autonomously created by AI[721]. Given the present dynamics of society, scholars and researchers believe that if the technologies that are solely generated by AI are given inventorship rights, this might lead to welfare loss for society. In the future, we must develop an understanding of AI inventions and how they operate. Can they function autonomously? If so, how would they do so? Do we have the necessary framework to support this evolution? How important is it now to address this issue?

Keeping these questions in mind, it is pivotal to note that much of the literature on this topic does not specify or cite technical definitions of AI inventions and how computational processes and configurations lead to the development of an invention. Considering software, for example, we do not find a precise definition of it, and when it comes to patenting it, not many countries around the world favour it. This is because of a reduced understanding of technical functionality and the gap between legality and technicality. Returning to AI inventions, the present scenario is such that their existence is often assumed as a basis for legal and policy discourse[722].

III. AUTONOMOUS *versus* AUTOMATED

Researchers in this field of programming have acknowledged that computers or software-performing tasks are purely based on high-level commands[723]. Without these commands and detailed instructions, it is unrealistic to assume that AI can work autonomously[724]. This clarifies that, at present, AI can only perform and autogenerate if automated. Accordingly, AI and robotics experts believe that the words 'autonomous' and 'self-learning' often exaggerate the abilities of AI[725]. Furthermore, a detailed study of the popular AIs of today's times revealed that "*the model was trained to predict the next token or oligomer and understand the protein language*"[726] which dispels any doubts regarding the statements made by AI and robotics experts about autonomy. To delve further into this, the

[719] Agence France-Presse, Social Media influencers face competition from AI-generated models, NDTV World, www.ndtv.com/world-news/ai-vs-humans-social-media-influencers-up-against-virtual-models-5391175.
[720] Caroline Ncube & Isaac Rutenberg, Intellectual property and fourth industrial revolution technologies, Leap 4.0. African Perspectives on the Fourth Industrial Revolution, (The Mapungubwe Institute for Strategic Reflection (MISTRA), Project MUSE 2021).
Also refer Thaler v Commissioner of Patents [2021] FCA 879.
[721] 'WIPO Conversation on IP' (n 2) paras 6-11.
[722] Ryan Abbott, The Reasonable Robot: Artificial Intelligence and the Law 23 & 24 (Cambridge University Press 2020).
[723] USPTO, Public Views on Artificial Intelligence and Intellectual Property Policy, (USPTO 2020).
[724] Rafael G. Engelhardt, The Foundations of AI: Human Influence and Control, 453 (Harvard Journal of Law and Technology 2022).
[725] "Open Letter to the European Commission. Artificial Intelligence and Robotics," http://www.robotics-openletter.eu/.
[726] Partha Pratim Ray, CHATGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope, 124 (KeAi journals 2023).

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estimated timeline for achieving Artificial General Intelligence ('Strong AI') is 2099[727].

All of these insights call for scrutiny of what legal and policy discussions mean by 'autonomously generated AI inventions.' However, in reality, it has been applied as a computational tool to solve problems in various fields. However, in such cases, it is unclear to what extent AI involvement should disqualify human inventorship, especially because using problem-solving tools has not traditionally impacted inventorship status. We might also question situations where microorganisms are used in biotechnological research and development, as they could be viewed as more suitable 'autonomous agents' with a level of inherent consciousness.

Policymakers often fail to adequately differentiate between the automation and autonomy of AI inventions, a distinction that is crucial for determining whether an output is AI-generated or merely AI-assisted. Moreover, there is a lack of precise and technical definitions of AI inventions. The recent trend of denying patent licenses to AI inventions is predicated on the phenomenon of autonomous generation of inventions, which has not yet materialized. The primary challenge for policymakers and international forums is to identify the origin of these inventions prior to making decisions regarding patent entitlement and inventorship rights. Consequently, it is imperative to create a framework for understanding these matters.

IV. AI INVENTIONS AND THEIR TECHNICALITIES

Now as we understand how patent laws and policies are reacting to these changes; we must also understand that there is no precise and technical definition of AI-inventions. It is inevitable to note that none of the reviewed policy documents provide a technical definition. For example, the WIPO draft issues paper asserts that "it now seems clear that inventions can be autonomously generated by AI." However, no supporting references are cited, and it's worth noting that, until recently, WIPO viewed this scenario as "science fiction."[728] The World Economic Forum white paper notes that *'AI is no longer just 'crunching numbers' but is generating works that have historically required human creativity and ingenuity"*[729] yet refers to legal and but not technical sources. The USPTO's request for comments adds to "AI inventions" by referring to both inventions that use AI and those developed by AI causing more inconsistencies rather than helping resolve the issue. Both types are said to include elements like "the application of AI, the structure of the training database, the training of algorithms on the data, the algorithm itself, and the results of the automated AI process."[730] This perspective, though, could benefit from greater clarity.

Accordingly, we must also distinguish between automation and autonomy. The AI's ability to generate and create autonomously has been widely criticized. However, has not come to the limelight because of the lack of technical definition. Autonomous refers to systems where an AI makes decisions and generates outputs without direct human intervention with a higher degree of independence. This can only be achieved by high-level guidance and strong AI. Machine learning is a prime example, designed to automate solutions to complex issues. However, autonomy implies self-rule, where systems operate independently of humans, which remains a theoretical concept with current technology.[731] AI though sometimes portrayed as "autonomous," still requires programming. Although terms like "autonomous" and "automated" are sometimes used interchangeably in technical literature,

[727] Martin Ford, Architects of Intelligence: The truth about AI from the people building it, 528 (Packt Publishing 2018).

[728] World Intellectual Property Organization Secretariat, Draft Issues Paper on Intellectual Property Policy And Artificial Intelligence, (2019), https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.wipo.int%2Fedocs%2Fmdocs%2Fmdocs%2Fen%2Fwipo_ip_ai_2_ge_20%2Fwipo_ip_ai_2_ge_20_1.docx&wdOrigin=BROWSELINK.

[729] Chris Allen, Empowering Humanity in the Age of Articial Intelligence: Standing at the Precipice of a New World, 43, https://www.empoweringhumanity.ai/chapter.pdf.

[730] World Intellectual Property Organization, Background Document on Patents and Emerging Technologies, 12 (2019), https://www.wipo.int/edocs/mdocs/scp/en/scp_30/scp_30_5.pdf.

[731] Stuart Russell & Peter Norvig, 4th Ed. US Intelligence: A Modern Approach, 37 (Pearson 2021).

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recognizing their differences is essential for addressing inventorship implications with AI. Whereas on the other hand, automation refers to the tasks that are performed by AI using tools and patterns. This does not require decision-making autonomy. For example, consider that software that uses AI has been created and other AI software. Here, we have to understand two main things, firstly, the role of automation, secondly, the presumed autonomy. Through this example, it is not wrong to presume that the AI has created another AI without human intervention. Rather it is a set of instructions fed by humans that has resulted in an output. Thus, concluding that AI in the present is just a problem-solving tool or a tool to achieve some ends and cannot mimic human problem solving[732]. "The nature of the claims put the spotlight on the inability of AIs to be fully autonomous inventors without the guiding hand of humans"[733].

The role of AI as a problem-solving tool raises questions about inventorship rights. Traditionally, the Patent laws across the world have not made any distinction between the inventions made by humans and those made through problem-solving tools.[734] For example, the utilization of optical instruments or microorganisms in research has not impacted the distribution of rights to inventorship. AI techniques can automate complex cognitive tasks such as problem-solving, data analysis, and pattern recognition. This automation has the potential to blur the lines of inventorship. On the other hand, it is very difficult to distinguish between the contributions of AI and humans, as AI systems are ultimately created by humans. It could also be said that human contribution in these instances is inadequate because AI inventions being automated and not autonomous poses questions in terms of granting inventorship rights. Given the foreseeable future it is improbable to justify the autonomy of AI systems which cannot operate without the guidance and intervention of humans can function in the creative process autonomously and also generate ideas. This situation prompts important inquiries as to whether automation driven by AI could potentially pose a challenge to conventional human inventiveness and the criteria that would be used to delineate such scenarios.

In the context of artificial intelligence, standards for patent ownership and inventorship. Human-machine interactions in inventorship are not specifically addressed by patent laws. According to established norms, an individual must make a substantial human contribution in order to be identified as the inventor. Most people would agree that performing simple tasks like turning on a computer or giving a simple command, like "solve this issue," does not qualify as an invention. Even though the idea of AI taking over most creative tasks seems far off, we may need to reconsider the requirements for human input in cases where AI performs crucial problem-solving functions.[735] The role of AI as a problem-solving tool complicates the idea of inventorship provided in the patent laws and policies. One view is a human's role in AI-assisted inventions may not be sufficient for inventorship. Conversely, it may be challenging to differentiate between human and AI contributions, given that humans design these systems. Since autonomous AI is capable of performing without human inputs, is very unlikely to be created or evolved soon. AI is currently used as an assisting tool in inventions and processes rather than an autonomous problem solver. However, AI's ability to automate complex cognitive tasks, like data processing and pattern recognition, blurs the boundaries of inventorship.[736] Thus, raising the question if AI inventions will eventually change the traditional human inventorship, as the

[732] Jarrahi, M.H. "Artificial Intelligence and the Future of Work: Human-AI Symbiosis in Organizational Decision Making," (Business Horizons 2018).

[733] L Hambraeus, Will AI Change How We Innovate? -A Study of Inventive AI, Patentability, and Inventorship in Light of the DABUS case, 24, (2021).

[734] L Hambraeus, *supra note 14*.

[735] Ryan Abbott, I Think, Therefore I Invent: Artificial Intelligence and the Future of Patent Law, 29 (2018), https://ipil.lu/app/uploads/2018/04/4_Abbott_Article_I-Think-Therefore-I-Invent.pdf.

[736] Martin Ford, *Architects of Intelligence: The Truth About AI from the People Building It* (Packt Publishing 2018).

misunderstanding and interchangeably using the words autonomous and automation has already challenged the traditional human inventorship concept.

The recent rulings on AI inventions can be divided into two categories. Those who are textualists and purposivism interpretations. Textualists are U.S. and U.K. Courts, they rely strictly on statutory language that lays the basis to grating inventorship rights.[737] The statutory language strictly mentions that the inventors must be natural persons. For example, the U.S. legal system's use of terms like "whoever" and "individual" implies that inventors must be human. Even the U.K. Courts argue that non-human entities cannot hold or transfer patent rights. On the other hand, purposivism interpretations, like those in Australia, view patent law as a mechanism to foster technological advancements.[738] Whereas the E.U. Courts have clearly nullified the concept of AI inventorship as seen in the case of DABUS. These divergences in AI Invention rulings clearly reflect the inconsistencies in policy and legal frameworks.

As AI becomes more integral to the inventive process, questions arise about its eligibility for patent protection. Patent law scholars suggest that principles of ownership, accountability, and public domain preservation should guide courts, patent offices, and policymakers. First, adapting "piercing the veil" from corporate law could ensure that patent rights remain with the human developers behind AI. Second, inventors should bear legal responsibilities associated with their patents, responsibilities that AI systems cannot currently fulfil. Finally, patent protection for AI-generated inventions must balance incentivizing innovation with maintaining a robust public domain for societal benefit.

V. CONCLUSION

As artificial intelligence (AI) continues to evolve and expand its role across various fields, the distinction between AI-generated and AI-aided inventions is becoming increasingly ambiguous. The traditional paradigm of inventorship necessitates natural persons to be inventors in order to benefit from the provisions of patent law. There is a need to establish a clear definition and framework for AI involvement in the invention process, as the lack of technical and legal distinction between autonomous and automated AI systems creates uncertainty regarding both invention and patent eligibility. The existing criteria, such as the European patent convention's human intervention requirement and Australia's invention-oriented approach, indicate that a uniform global framework is essential. This framework should acknowledge AI capability and complexity while preserving human contribution in the inventorship process. Furthermore, it must adopt principles akin to piercing the corporate veil from corporate law to retain patent rights with natural persons or individuals who recognize AI inventions. This approach will enable the natural person to retain inventorship rights, as AI systems currently cannot be held accountable for potential adverse outcomes. Thus, upon completion of research, the initial hypothesis was confirmed: there is a critical need for distinction between automation and autonomy to determine whether an invention is AI-aided or AI-generated, which will establish clear criteria for patent eligibility. The current lack of technical clarity serves as an impediment to innovation and effective policymaking.

[737] H. Sun, Artificial Intelligence Inventions, (Florida State University Law Review 2022), https://ir.law.fsu.edu/cgi/viewcontent.cgi?article=2762&context=lr.
[738] Ibid.