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# Crossing Frontiers: A Comparative Exploration of AI Inventorship and Ownership in Patent Law

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## ABSTRACT

*This article aims at examining inventorship and ownership of Artificial Intelligence (AI) systems in patent law. This is achieved by employing a comprehensive review of relevant patents Acts, policy documents and cases such as Thaler v. Iancu, case no. 1:20-cv-00903 (E.D. Va). The review is coupled with the analysis of AI inventorship and ownership across various jurisdictions such as the United States of America, European Union and South Africa. This is done to understand the criteria for determining inventorship, ownership and the contemporary interpretations of the concept of "intelligence." The article finds that current patent laws encounter difficulties in adequately protecting AI-generated or assisted inventions due to limitations in recognizing AI as inventors. It is therefore argued that if the current patent system cannot accommodate AI related inventions, then there is urgent need to consider a sui generis system tailored to address the unique challenges posed by AI inventions within patent law. Taken together, the article underscores the need for patent legal frameworks to ensure fair treatment and protection of AI-generated or assisted inventions. The article also notes that there is need for further research for an enhanced understanding of the interplay between AI and patent law.*

**Key words:** Artificial Intelligence (AI), Inventorship, Ownership, Patent Law, Sui Generis System.

## 1. INTRODUCTION

Artificial Intelligence (AI) has become a pivotal force in contemporary technological advancement. It is influencing a vast number of industries and reshaping conventional standards. Within the sphere of patent law, the question of AI inventorship has surfaced as a critical issue, calling for a thorough comparative assessment. This paper sets out to achieve two main objectives in this context: firstly, to explain the reasons for the current patent frameworks' reluctance to recognize AI systems as inventors; and secondly, to advocate for the consideration of a sui generis approach to protect AI-generated inventions, or alternatively, to explore the adaptation of the existing patent system to address the specificities of AI inventorship.

## 2. CONTEXT

The literature on the attribution of inventorship to AI systems within patent law reveals a growing recognition of the complexities and implications associated with this issue. Scholars and legal experts have increasingly turned their attention to the challenges posed by AI-generated or assisted inventions and the need to reconcile traditional legal frameworks with advancements in AI technology.[1] One prominent area of discussion in the literature is the definition of inventorship and its application in the context of AI. Scholars and regulatory authorities are exploring the traditional criteria for inventorship, such as conception and reduction to practice, and consider how these criteria apply or fail to apply to AI systems.[2] Questions arise regarding whether AI systems possess the requisite attributes to be considered inventors under existing legal frameworks, including questions of consciousness, intentionality, and autonomy.[3]Additionally, the literature examines the legal and ethical implications of attributing inventorship to AI. Scholars debate the ramifications of recognizing AI as inventors, including issues related to ownership, liability, and

intellectual property rights in general. Concerns are raised about the potential for AI-generated inventions or assisted inventions to disrupt established norms of patent law and innovation. This leads to calls for new approaches to address the unique challenges posed by AI inventorship.

Furthermore, the literature provides insights into the approaches taken by different jurisdictions to address the issue of AI inventorship. Comparative studies analyze the legal frameworks and case law in various jurisdictions, highlighting differences in terminology, criteria, and outcomes. These studies offer valuable perspectives on the effectiveness of existing legal regimes in accommodating AI inventorship and the need for harmonization or reform.[4]

Overall, the literature underscores the urgency of addressing the implications of attributing inventorship to AI within patent law. Scholars call for interdisciplinary collaboration between legal experts, ethicists, technologists, and policymakers to develop thoughtful and equitable solutions that balance innovation, fairness, and societal welfare in the age of AI.

## 3. DEFINING AI

Defining AI can be challenging due to the multidisciplinary nature of the field and the evolving capabilities of AI systems. The concept of AI is really fluid. Furthermore, the exact definition and import of the word “intelligence”, and considerably more so of AI, is the subject of a lot of controversy and has created a ton of turmoil.[5] For example, one reference work alone, gives four meanings of AI. It firstly provides that AI is concerned with the development of computers being able to engage in human-like thought processes such as learning, reasoning, and self-correction. Secondly, it says that AI is the concept that machines can be improved to assume some capabilities normally thought to be like human intelligence such as learning, adapting and self-correction. Thirdly, it is the extension of human intelligence through the use of computers, as in times past physical power was extended through the use of mechanical tools. Fourthly and lastly, it is the study of using computers more effectively by improved programming techniques.[6]

Despite the controversies surrounding the exact meaning of AI, it is generally agreed that it is a branch of computer science that aims at creating systems and robots that can perform activities that are thought to require human intelligence with little to no assistance from humans. This entails the simulation of human intelligence in machines that are programmed to think, learn, and perform tasks that typically require human intelligence. These tasks include problem-solving, understanding natural language, recognizing patterns, speech recognition, and visual perception, among others. The goal of AI is to develop systems that can perform tasks intelligently, often aiming to replicate or augment human cognitive abilities.

This article adopts, "narrow AI" which refers to strategies and programs created to carry out particular tasks.[7] The opposite of the foregoing is “general or strong AI”. This type of AI, still largely theoretical, would have the ability to understand, learn, and apply knowledge across a wide range of tasks, similar to a human being. General AI possesses a level of intelligence that would enable it to perform any intellectual task that a human being can. Adopting narrow AI for the purpose of this article is important because although this field is swiftly developing, it is unclear when science will develop to greater degrees of general intelligence, which is no longer geared to tackle particular issues but to operate across a large spectrum of contexts and tasks.[8]

It is the author’s view that these definitions may need periodic updates to reflect ongoing advancements in the field. As AI continues to evolve, efforts to define and regulate it will likely persist, requiring collaboration among experts from various domains to develop comprehensive and adaptable definitions. Also, the “Blackbox” nature of AI, makes it important to regularly review the definition assigned to it.

### 3.1 WHAT IS PATENT INVENTORSHIP AND OWNERSHIP?

International conventions on patent law, generally recognize and emphasize the personal rights of inventors in relation to their inventions. Key international agreements, set out principles that aim to protect and acknowledge the contributions of individual inventors.[9] For instance, article 4(tar) of the Paris Convention for the Protection of Industrial Property requires that in the patent application, the inventor should have the right to be referred to as such.[10]



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In addition, article 4.5 of the Patent Cooperation Treaty requires that the inventor's name be included in the patent application as a mandatory feature of such a submission.[11] Clearly, these international conventions emphasize an inventor's right to be named as such in patent applications and related documents. Recognition as an inventor acknowledges the individual or individuals who made the substantive creative and inventive contributions to the development of a new product or process.

It said that the individual who originated the invention is recognized as the inventor, whereas the one submitting the patent application or owning the patent is the individual or entity responsible for filing the application.[12] Although there are instances where the inventor and the applicant are the same person, they are typically distinct entities, with the applicant often being the business or research organization employing the inventor.[13]

In general, an individual is considered an inventor if they originated the initial idea or concepts that set the course for the research leading to the patented invention, such as directors or participants in a brainstorming session.[14] Put differently, inventorship entails identifying individuals who have made a substantial and innovative contribution to a novel and non-obvious idea or invention eligible for patent protection. On occasion, a person may qualify as an inventor if they conceived a portion of the invention specified in at least one claim of a patent application or interpreted data that unexpectedly led to the development of a patented invention.[15] Conversely, someone is not recognized as an inventor if their role involves merely following given instructions or providing general assistance or advice in the research or invention process.[16]

The patent inventorship landscape is particularly intriguing when it comes to inventions by employees. In numerous jurisdictions, inventions created during the course of employment are automatically attributed to the employer, provided this is explicitly outlined in the employment contract.[17] If there is no contractual agreement in place, the inventor might maintain the right to utilize the invention, while the employer typically receives a non-exclusive right to use the invention for internal purposes.[18]

The second classification pertains to independent contractors. In the majority of legal systems, unless explicitly stated otherwise, an independent contractor hired by a company to develop a new product or process retains all rights to the invention.[19] In essence, this implies that unless there is a documented agreement between the contractor and the company assigning ownership of the invention to the company, the company would lack any proprietary rights over the created work, despite having funded its development.[20] The third situation involves joint inventors, where multiple individuals significantly contribute to both the conception and completion of an invention. In such cases, it is essential to recognize them as joint inventors and include their names in the patent application.[21] If the joint inventors are also the applicants, they will collectively receive the patent.[22] The fourth classification pertains to co-ownerships, where institutions have varying regulations concerning the utilization and adherence to patents shared by multiple entities or individuals.[23] In specific instances, a sole co-owner cannot license a patent or initiate legal action against third parties for infringement without obtaining consent from all other co-owners.[24]

Upon examining the concepts of inventorship and ownership, it becomes clear that these are separate ideas.[25] In certain situations, an inventor may not be the patent owner, and vice versa.[26] Inventorship is often based on a specific contribution to the inventive idea (the spark of genius), while ownership may hinge on the circumstances of the work leading to the invention and the precise terms of an employment agreement. Ownership of a patent, in essence, denotes the legal authority to control, use, license, and transfer the patented invention.[27] The individual or entity holding the patent possesses the exclusive right to prevent others from making, using, selling, or importing the patented invention.

The issue of ownership in patent matters revolves around the authority to uphold patent rights. The entity enforcing these rights possesses the ability to prohibit others from producing, utilizing, and vending the patented subject matter. The holder of exclusionary rights also retains the capacity to grant licenses and transfer ownership.[28] Therefore, by tracing the ownership of a patent, one can discern who ultimately stands to profit from these rights. Patent ownership, akin to other forms of intellectual property, is a form



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of possession, just like owning a house. Similar to selling a house, an inventor can transfer ownership of their patent to another party. Once ownership changes hands, the original inventor loses the right to enforce the patent against others. Additionally, an inventor may choose to license the patent to a third party, similar to leasing a house.[29]

It is important to emphasize that AI has emerged as a powerful force in innovation, contributing to breakthroughs in various industries. From machine learning algorithms to autonomous systems, AI technologies are generating inventions that were once solely within the purview of human ingenuity. As these advancements reshape the landscape of invention, patent systems are faced with a burning question: Can AI be considered an inventor and/or owner?

### 3.2 THE CONCEPT OF INVENTORSHIP IN SELECTED JURISDICTIONS

Given that existing legal frameworks generally do not recognize AI systems as legal entities capable of property ownership or employment in the traditional sense, submitting a patent application with AI listed as the inventor is likely to face rejection due to inherent legal limitations.[30] To address this issue, it is crucial to assess whether current legal systems appropriately classify inventors when AI is involved in the creation of an invention. The following sections will explore the notion of inventorship and ownership in specific jurisdictions.

### 3.4 UNITED STATES OF AMERICA

It is helpful to start by mentioning that the United States of America (US) patent law provides that a person who invents patentable subject-matter has the right to a patent.[31] Consequently, U.S. patent applications must mention the "true and only" inventors.[32] Although this rule seems to be straightforward, the Federal Circuit Court of Appeal has struggled with the issue of proper inventorship at least a number of times in the past years and has overturned nearly half of the decision from the district courts on this issue.[33]It is said that an invention in the US is a two-step process: (1) conception of the idea or subject matter of the patent claims, which may be comprised of several claims; and (2) reduction of the idea to practice, or making a working example of the claimed invention.[34]

In the legal framework of the US, establishing correct inventorship primarily centres on the conception phase, which entails pinpointing individuals responsible for conceiving the ideas outlined in the claims.[35] Conception is defined as "the creation in the inventor's mind of a clear and enduring idea of the fully functional invention, as it will be implemented in practice."[36] Consequently, "conception" should be interpreted in its ordinary sense, relating to conscious awareness and self-realization.

The phrase "definite and permanent" suggests that the invention can be practically realized or a working model can be established with only average skills, without the need for extensive study or experimentation.[37] Therefore, conception is considered achieved when the idea is clear and stable enough for someone with ordinary expertise in the field to implement it without unnecessary trial and error.[38] Complete conception entails covering all aspects of the claimed subject matter in the patent.[39]

To conduct an assessment of inventorship, the focus is on the invention itself as specified in the patent claims, rather than just the definitions. The initial step involves determining the scope and interpretation of the claims.[40] Once the precise content of the claims is identified, it becomes feasible to confirm the individuals who rightfully conceived each claim outlining the invention.[41]In the context described, the individual who conceives an invention is considered the inventor, and if the conception involves multiple individuals, they are recognized as joint inventors. The invention is defined by the details outlined in the claims.[42] Currently, only humans are recognized as both inventors and owners in the realm of AI system inventions.[43]

It is therefore no surprise that on 27 April 2020, the United States Patent and Trademark Office (USPTO) rejected an application naming AI machine called DABUS as the inventor. Dr. Stephen Thaler developed an artificial intelligence system named DABUS (Device for the Autonomous Bootstrapping of Unified Sentience) with the primary function of generating inventions. Unlike many other AI-based patent applications that utilize AI as a tool, DABUS was not



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designed to address a specific problem, was not trained on data specifically related to the inventions it generated, and, notably, the machine itself, rather than a human, identified the novelty and significance of the inventions in question.

The USPTO relied on the statutory text of title 35 of the United States Code and reasoned that the key inventorship investigation was who conceived the invention, and that conception is a mental process which can only be carried out by humans.[44] It was thus stated:

> *Conception is the touchstone of inventorship, the completion of the mental part of invention. It is the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice. Conception is complete only when the idea is so clearly defined in the inventor's mind that only ordinary skill would be needed to reduce the invention to practice, without extensive research or experimentation. [Conception] is a mental act.*[45]

Aggrieved with the above holding, Thaler brought an action before the Virginia Eastern District Court in the case of *Thaler v. Iancu*, case no. 1:20-cv-00903 (E.D. Va). However, Judge Leonie Brinkema ruled in favour of the USPTO. The Judge, in her ruling, expressed support for the U.S. Patent and Trademark Office's (USPTO) interpretation of the Patent Act, stating that it was carefully considered and aligned with both the language of the Act and relevant legal precedents. She emphasized that the USPTO's stance, asserting that an "inventor" must be a natural person, deserves deference. Even without deference, the judge maintained that the USPTO's conclusion is legally sound.[46]

Additionally, Judge Brinkema highlighted that the responsibility of broadening the definition of inventorship lies with lawmakers. She reasoned that while policy considerations are important, they should not override the clear intention of Congress to limit the definition of "inventor" to natural persons. The judge acknowledged the possibility that as technology advances, AI may one day reach a level where it could meet the accepted criteria for inventorship. However, she emphasized that until that point is reached, and if it does, any expansion of patent law's scope should be a decision made by Congress.[47]

The above decision was appealed all the way to the supreme court of the US. It was contended in the Supreme Court by Dr. Thaler that the lower court's decision, which denies patent protection to an entire category of innovation, limits the capacity of the US patent system and goes against Congress's intention to effectively encourage innovation and technological advancement in the United States. On the 24th of April 2023, the Supreme Court of the United States declined to hear the appeal brought by Dr Stephen Thaler in relation to whether AI can be named the inventor of a patent. This decision meant that the lower court’s ruling holds — US patents can only be issued to human inventors and that Dr Thaler’s AI system DABUS could not be considered the legal creator of two inventions that Dr Thaler said it generated.[48]

To summarise the US situation, it appears that the existing US patent system can continue to operate effectively in relation to inventions involving AI activity. If the advancement of AI technology is to the degree that human concepts could no longer be established and inventions could be created entirely without such human input, modifying the current regime might be appropriate. That said, the decision by the US Supreme Court means the US as a country remains in line with the current international treatment of AI, as patent applications naming DABUS as an inventor have so far been rejected as the following paragraphs will demonstrate.

### 3.6 EUROPEAN UNION

European patent law traditionally follows a similar approach to the U.S., recognizing natural persons as inventors. The European Patent Office (EPO) also has not recognized AI systems as inventors. The EPC requires an inventor to be a natural person. The reluctance to recognize AI systems as inventors is often based on the legal and ethical complexities surrounding issues of attribution, ownership, and responsibility. While there is an inclination towards embracing innovation, European patent law aims to strike a balance by maintaining the integrity of patent law, which traditionally involves the identification of natural persons as inventors.



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In the realm of patent systems, particularly within the European system, the fundamental concepts of inventorship and ownership play a crucial role. The entitlement to a European patent primarily pertains to the individual who conceived the invention.[49] The inventor possesses both legal and moral rights, with a special emphasis on the right to acknowledgment and recognition.[50] These rights find protection in Article 62, Article 81, and Rule 19(1) of the EPC. The specified rights outlined in these articles encompass the entitlement to be acknowledged and the mandatory designation of the inventor, which includes indicating the source of the right to the invention when the claimant is not the inventor.

As a result of the circumstances mentioned, on 27th January, 2020, the EPO disclosed the grounds for its decision to reject two patent applications from the previous year, wherein a computer named "DABUS" was indicated as the inventor. In both applications, "DABUS" was described as a form of artificial connectionist intelligence.[51] The EPO refused the patents, citing non-compliance with Article 81 and Rule 19 of the EPC, which mandate that a European patent application must specify a human inventor.

The clarification above emphasized that for an inventor to be named, they must be the legitimate creator and possess the ability to utilize associated privileges.[52] The EPO highlighted that these privileges cannot be exercised by an AI inventor lacking a legal identity, and merely using a computer name does not meet the criteria outlined in Rule 19(1) of the Convention. Notably, the EPC does not mandate the involvement of non-person entities as applicants, inventors, or in any other capacity throughout the patent granting process.

### 3.7 ASIA

AI is booming rapidly in Asia and new patenting AI rules and guidelines are now thriving and providing new opportunities for AI invention applicants. This trend brings new challenges to the typical patentability model. As already alluded to, AI systems are now producing inventions in circumstances where the machine fulfils the criteria to qualify as an inventor rather than a human being.[53] It must be noted that Asia has grappled with reconciling its commitment to technological advancement with the traditional understanding of inventorship. This section explores the nuances of AI inventorship in key Asian jurisdictions, highlighting both divergence and convergence in patent law perspectives.

### 3.8 CHINA

In China at the moment, the inventor of a Chinese patent application can only be human. Under Chinese patent law, an inventor is understood to be any person making creative contributions to the substantive characteristics of an invention.[54] Therefore, it is important to describe what substantive features and creative contributions mean in the present sense in order to figure out who the creator may be in a given scenario.

The legal precedents from Chinese courts suggest that activities such as contributing through organizational operations or providing necessary equipment, which are ancillary to the invention, do not constitute a contribution to the substantive features of the invention. In this context, "substantive features" seem to align with the concept of inventiveness outlined in Article 22(3) of the Chinese Patent Law.[55] According to this law, inventiveness is defined as the presence of distinctive substantive features that signify significant progress compared to prior art, making the invention or utility model non-obvious. This interpretation closely mirrors the definition provided in Article 22, paragraph 3 of the Chinese Patent Law regarding inventiveness.[56]

As regards the creative contribution, some jurisprudence indicates that it applies to innovative intellectual research done in relation to the above substantive characteristics.[57] It appears therefore that both creative contributions and substantial features are measured in relation to what makes the claimed invention patentable in relation with the prior art, it is probable that the invention in the present sense implies the invention as claimed,[58] thus as described in the claims provided. That being the case, it is unlikely that inventions alleged at present or even in the near future would include a human being who has made such an intellectual contribution to that which distinguishes the invention from the prior art.[59]



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While AI systems theoretically have the potential to generate crucial content for ground-breaking inventions, Chinese Patent law is likely to acknowledge human contributions and the development of the underlying idea.[60] Essentially, the law should grant a patent to an invention where the creative element, influenced by human intervention, is a result of chance rather than pure genius.[61]

The above can be contrasted with a decision by a Chinese court in Shenzhen, Guangdong province, which recognized copyright protection for an artificial intelligence-generated work.[62] The court's ruling stemmed from a lawsuit filed by Tencent against an online platform that, without authorization, copied an article produced by Tencent's AI program, Dreamwriter, detailing loan information.[63] The court ruled that the article's expression adheres to the standards for written work, demonstrating a thoughtful selection, analysis, and judgment of pertinent stock market information and data. The court also commended the article for its logical layout, clear reasoning, and evident creativity.[64] It will be intriguing to observe the potential widespread implications of this decision and whether similar reasoning can be extended to the field of patent law.

### 3.9 JAPAN

Japan, like many other jurisdictions, grapples with the complex issue of AI inventorship within its patent legal framework. The concept of AI as an inventor poses challenges that traditional patent laws may not have anticipated. Here are some key aspects related to AI inventorship in Japan. Japanese patent law lacks a specific definition of inventorship, relying instead on interpretations found in case law. A Tokyo District Court case exemplifies this approach, where the court rejected a plaintiff's claim of inventorship by stating that a concept not subjected to a certain experiment remained a mere research theme and could not be deemed the relevant invention. This reasoning served as the basis for the court's decision to dismiss the inventorship argument.

According to an AIPPI report within the Japanese context, if individual A devises a solution to a problem, they are likely to be acknowledged as the inventor.[65] Even if person A only identifies the problem, they might still be recognized as the inventor (or co-inventor) if the problem itself is a key aspect of the invention. In the scenario where person B conceives the solution to the problem, even if guided by person A, person B can be regarded as the inventor. However, if person B merely verifies that the problem has been resolved, they often may not be acknowledged as an inventor. Based on the forgoing, analogy, it is evident that Japan demands innovative efforts to substantiate the asserted invention. Administrative tasks alone, while crucial, are insufficient for this purpose. The activities undertaken must demonstrate creativity and are to be evaluated on a claim-by-claim basis.[66]

In summary, considering the Japanese context and applying the aforementioned insights to AI systems, it is evident that, at present and in the foreseeable future, the concepts of inventorship and ownership are applicable solely to humans. While the question of whether an AI device can meet the criteria for co-inventorship remains distinct, employing a logic akin to the one discussed in relation to China suggests that a human contributor making a creative input to the invention is likely to be acknowledged as the inventor in the current and anticipated technological landscape.

### 3.10 SOUTH KOREA

South Korea, renowned for its advancements in technology and AI, has seen significant achievements in the field of AI invention. The country has actively encouraged research and development in AI, resulting in numerous ground-breaking inventions and contributions from its scientists, engineers, and companies.

It is important to note that the Korean Patent Act does not specifically define inventorship.[67] However, Korean court case law provides an interpretation which states that an inventor is someone who has significantly contributed to the development process of an invention.[68] To be recognized as an inventor, one must have made a creative contribution to an item mentioned in a claim. Hence, inventorship is determined on a claim-by-claim basis.



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Similar to the other regions covered in this article, it is highly unlikely, under Korean patent law that the current or forthcoming technological landscape will lead to an invention without any identifiable human inventor.[69] There is also the potential to identify an individual who played a substantial role in the creative process of developing the asserted invention and contributed significantly to that specific aspect of the process.[70]

In a nutshell therefore, the legal status in all the relevant jurisdictions considered herein requires human beings to be recognized as inventors, regardless of the presence of AI in the invention process. It has also become evident that it would currently be difficult for AI systems to be recognized as inventors under inventorship rules in many jurisdictions. This is because and inter alia, of the correlation between inventorship and ownership, which often needs an employment relationship to be created. Since ownership and employment are legal terms that are irrelevant in the sense of AI systems at present, inventorship is restricted to human actors.[71]

In addition, it should be remembered that all applicable jurisdictions provide that an inventor may make a contribution to the conception of the invention, whether directly or implicitly. In the same way, a corporation, despite its legal identity, cannot formulate anything by itself, but instead the people who work for it. Thus, it is suggested that, in order to be regarded as an inventor under the existing definition, it is important to be able to employ human faculties rather than merely produce a certain product.[72]

### 3.11 TWO WINS FOR AI-INVENTORS IN SOUTH AFRICA AND AUSTRALIA

South African's patent office, the Companies and Intellectual Property Commission was the world's first jurisdiction to issue a patent listing an AI entity as an inventor in 2021.[73] In addition, the commission reasoned that the owner of the AI system is taken to be the owner of the patent. After a short period of time from South Africa´s decision, Justice Jonathan Beach of the Federal Court of Australia also ruled in favour of AI and held that a non-human can be named as the inventor of a patent. The sole judge went on to state that Australia's Patents Act of 1990 does not define an inventor and no specific provision in the Act expressly refutes the proposition that an AI system can be deemed an inventor.[74] The Australian perspective will be examined in greater detail in a subsequent section of this article.

It is worth highlighting the distinctive nature of South Africa's patent laws in comparison to those of the European Union and the United States.[75] Notably, South Africa lacks a substantive examination process; applicants can advance to patent status by completing the filing alone. This may not be the most robust endorsement for the AI system as some scholars have thought.[76] The commission's rationale asserts that the AI system's owner is deemed the patent holder, with the filing process being the sole requirement for obtaining a patent. It's important to emphasize that the substantive South African patent act does not explicitly rule out AI inventorship. Given the absence of a defined 'inventor' in the Patent Act 57 of 1978, there's room for argument that the Act could conceivably encompass an AI system.[77] Although it must be remembered that even if the Act does not define an inventor, it makes reference to an inventor as `him`. Going by the literal rule of interpretation, this could mean that an inventor is perceived to be a human being.

It's crucial to highlight that the examination process for South African patent applications is not stipulated by the Patents Act and the Patent Rules. This becomes particularly significant when a South African patent application is based on a preceding application submitted under the Patent Cooperation Treaty (PCT). According to Section 43F (2) of the South African Patents Act, the regulations established under the PCT and the administrative instructions issued in accordance with the PCT regulations supersede the Patents Act in the evaluation of a patent application derived from an earlier submission under the PCT.[78]

The patent application submitted under PCT, bearing the number PCT/IB2019/057809, laid the groundwork for the patent lodged in South Africa. Consequently, adherence to the PCT Rules, which necessitate a formal examination procedure before granting a patent, would have guided its assessment by the registrar. If a South African patent application relies on a preceding PCT application that includes a declaration of inventorship as per Rule 4.17(i) of the PCT regulations, the registrar is restricted, under Rule 51bis.2 of the PCT Regulations, from seeking any



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documentation or evidence related to the identity of an inventor specified in that application unless there is valid doubt about the accuracy of the identification. In this case, the initial PCT application supporting the patent did indeed include a declaration of inventorship by Rule 4.17(i), limiting the registrar's authority to inquire into the inventor's identity. Contemplating the potential outcome had the registrar pursued such a request adds an intriguing dimension to the scenario.[79] The next section considers the Australian situation which has already been introduced above.

The Australian case of Thaler v Commissioner of Patents [2021] FCA 879 marked a significant but short-lived victory for an AI system. This outcome was particularly noteworthy because Australia's patent laws share similarities with those in the United States and Europe.[80] Initially, the Australian Patent Office, akin to its counterparts in the US and Europe, rejected patent applications based on comparable grounds. However, a later decision by an Australian court overturned the patent office's stance, affirming that "an artificial intelligence system can be considered an inventor under the Act [15(1) of the Patents Act 1990 (Cth)]." Justice Jonathan Beach's remarks, among other things, likely elucidate the reasoning behind this decision. The exact words were:

> *First, an inventor is an agent noun; an agent can be a person or thing that invents. Second, so to hold reflects the reality in terms of many otherwise patentable inventions where it cannot sensibly be said that a human is the inventor. Third, nothing in the Act dictates the contrary conclusion.*[81]

The decision above, reflects a notable development in recognizing AI as an inventor. This recognition aligns with a growing trend to adapt patent laws to accommodate advancements in technology. Courts and patent offices are grappling with the need to strike a balance between fostering innovation and maintaining the traditional concept of inventorship. Also, Justice Jonathan Beach's statement, if available, would likely provide insights into the court's reasoning behind recognizing AI as an inventor. The rationale might involve considerations such as the statutory language of the Patents Act, the policy implications of excluding AI systems, and the desire to keep pace with international standards.

However, this win for DABUS in Australia was short lived because on appeal, the panel of five judges of the Federal Court noted that the issue of Thaler's entitlement to the invention was not before the primary judge. However, the panel decision then went on to explain that the purpose for providing the name of the inventor on the patent application is to ensure clear entitlement of the invention to the applicant.[82] While Thaler did name DABUS as the sole inventor, the panel agreed with the Commissioner that this did not meet the name requirement because it was a legal impossibility for an AI machine to be the inventor of the invention, such that the patent application lapses.[83]

It is important to note that the ruling in the case at hand, clarifies that "only a human, or other legal person can be an owner, controller or patentee." That is, the court made it clear that the ruling affects only patent inventorship and not patent ownership.[84] Furthermore, the court also noted that such a construction would be consistent with patent law's object of rewarding innovation.[85]

What can be concluded from the above discussion of the concept of inventorship in selected jurisdictions is that the landscape of AI inventorship in patent law is evolving, and jurisdictions worldwide are at various stages of grappling with this complex issue. As AI continues to push the boundaries of innovation, the need for a harmonized and adaptive legal framework becomes increasingly apparent. This article offers a comparative analysis that not only sheds light on the current state of affairs but also paves the way for informed discussions and policy decisions on the future of AI inventorship in patent law. The import of the next section of this article will encourage countries to go beyond the boundaries of conventional thinking as the realm of AI inventorship presents an opportunity for legal systems to innovate and adapt to the changing face of technological progress.

### 3.12 SHOULD CONSIDERATION BE GIVEN TO A SUI GENERIS SYSTEM OF PATENT RIGHTS FOR AI-GENERATED or ASSISTED INVENTIONS IN ORDER TO ADJUST INNOVATION INCENTIVES FOR AI?



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"Sui generis" is a Latin term that translates to "of its own kind" or "unique." In various contexts, the term is used to describe something that is distinct and does not fit neatly into existing categories or classifications.[86] When referring to a "sui generis system," it typically means a unique or specialized system that does not conform to standard or established models. It's important to approach AI protection comprehensively, considering legal, ethical, and technical aspects and a sui generis system might be one of the possible solutions to these challenges.

As discussed above, employing the current patent laws to protect AI generated inventions presents difficulties. Given the unsuitability of the current patent system, a sui generis system may be required to specifically protect AI inventions. When a particular issue is unsuitable for fitting into an exact legal form of protection, it is not unusual to craft an ad hoc system that takes into account the precise facets that make it fall outside the scope of protection.[87]

Finding a stable and clear legal system that ensures protection for AI-generated creativity is crucial because the ability of AI technology to invent and create holds immense value for humanity.[88] As machines become more advanced, they might produce artistic works that surpass human capabilities, making it imperative to address this matter promptly.

The development of a sui generis system could be a suitable solution to address the challenges posed by AI-related inventions. This is because a sui generis system possesses specific attributes that are specifically designed for the protection of the subject matter it covers, and it often differs from traditional patent laws in terms of what is necessary for a subject matter to be included. Additionally, certain aspects like the duration of protection, when the rights granted commence and the definition of an inventor can be altered in this system.[89]

In as much as moral rights should not be granted in this sui generis system, economic rights could be granted by default to owners of the AI system. For example, direct and indirect infringements would certainly apply to AI-generated innovations in the same way they do to patentable subject matter.[90] This is because an AI's output would probably be something specific, like a product which can be sold, used, imported, or kept by the owner.[91]

If such a system is used, it becomes more difficult to ensure that applicants select the best system rather than the easiest one.[92] The applicants should not be allowed to base their decision to apply in one system on the likelihood of success. Applicants will invariably choose for the other system to gain protection if one system has a higher bar for invention. As a result, care should be taken to guarantee that such a sui generis system remains applicable in the face of such behaviour.[93]

Although a sui generis system may seem like the perfect solution to the challenges of AI inventorship, there is an argument that existing laws are already flexible enough to handle this issue.[94] Throughout history, old laws have been modified to address new situations and developments in society. For example, when computers emerged, the U.S. considered a sui generis system for computer programs but instead chose to amend the Copyright Act of 1976 to include them as copyrightable literary works. Similar action could be taken for AI inventions.[95] It suffices to mention that several other models have been proposed to deal with AI-related inventions. These models range from creating legal fiction for AI, introducing the Multiplayer Model and applying the Coase Theorem to patent law. These models have not explored in greater details because they are not the focus of this article.

## 4. CONCLUSION

The article has revealed that while jurisdictions differ in their terminology and criteria for identifying an inventor, the fundamental goal remains constant: recognising the intelligent and creative aspects of an invention. The prevailing understanding of intelligence often excludes AI systems due to their lack of consciousness and self-awareness. Since AI cannot be named an inventor, dealing with the issue of ownership has also become come complicated. This poses substantial challenges in effectively protecting AI-generated or assisted inventions under existing patent laws. From the discussions in this article, it is evident that there is the need to either develop a dedicated system to safeguard AI inventions or adapt existing patent laws to accommodate the unique nature of these inventions by engaging in a more purposeful interpretations of patent laws. Only then, can there be a fair and effective protection for AI generated or assisted inventions.



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## List of References


[1] Ryan Abbott, The Reasonable Robot: Artificial Intelligence and the Law (Cambridge University Press 2020)
[2] See USPTO, Request for Comments on Patenting Artificial Intelligence Inventions (United States Patent and Trademark Office 2019) and EPO, Guidelines for Examination (European Patent Office 2019)
[3] Shlomit Yanisky-Ravid and Xiaoqiong (Jackie) Liu, 'When Artificial Intelligence Systems Produce Inventions: The 3A Era and an Alternative Model for Patent Law' (2017) 39 Cardozo L Rev 2215
[4] WIPO, WIPO Technology Trends 2019: Artificial Intelligence (World Intellectual Property Organization 2019)
[5] J. Kok and others, 'Artificial Intelligence – Artificial Intelligence: Definition, Trends, Techniques and Cases' https://www.eolss.net/Sample-Chapters/C15/E6-44.pdf accessed 14 April 2022.
[6] *The New International Webster's Comprehensive Dictionary of the English Language*, Comprehensive edition (February 2003) https://www.amazon.com/International-Websters-Comprehensive-Dictionary-Language/dp/1582795576.
[7]WIPO, 'Comments on Inventorship and Ownership of AI' (2020) https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=459091 accessed 6 November 2023.
[8] Ibid
[9]Singh R, Law Relating to Intellectual Property (A Complete Comprehensive Material on Intellectual Property Covering Acts, Rules, Conventions, Treaties, Agreements, Case-Law and Much More) (1st edn, New Delhi: Universal Law Publishing Co. Pvt. Ltd 2004).
[10]G. Patrick, 'Determining Inventorship for US Patent Applications' (2005) https://agsci.oregonstate.edu/sites/agsci/files/main/research/vrc_release_inventorship-gattari.pdf accessed 22 March 2022.
[11] Ibid
[12]WIPO, 'inventing the Future: An Introduction to Patents for Small and Medium-sized Enterprises' (WIPO, 3 May 2020) https://www.wipo.int/edocs/pubdocs/en/sme/917/wipo_pub_917.pdf accessed 6 November 2023.
[13] Ibid
[14]James & Wells, 'Champions of Innovation: Patent Inventorship and Ownership - What are the differences' (James & Wells, 3 May 2022) http://www.jamesandwells.com/wp-content/uploads/patent-inventorship-and-ownership-what-are-the-differences.pdf accessed 6 November 2023, 1-3.
[15] Ibid
[16] Ibid
[17] As an example, see article L611-7 point 1 of the French intellectual property code
[18] WIPO, *Inventing The Future: An Introduction to Patents for Small and Medium-sized Enterprises*, accessed at https://www.wipo.int/edocs/pubdocs/en/sme/917/wipo_pub_917.pdf (3 May 2022) pp. 14-15.
[19] Ibid
[20] Robert Patrick Merges and John Fitzgerald Duffy, *Patent Law and Policy: Cases and Materials* (8th edn, 2021) 1334 pp, ISBN 978-1-5310-1175-8, Looseleaf 978-1-5310-2385-0, eISBN 978-1-5310-1176-5.
[21] Ibid
[22] Red, 'Research and Development: Guide to Inventorship' (University of Bristol, https://www.bristol.ac.uk/media-library/sites/business/documents/commercialisation/Inventorship.pdf, 8 November 2023).
[23] Robert Patrick Merges and John Fitzgerald Duffy, *Patent Law and Policy: Cases and Materials* (8th edn, 2021) 1334 pp, ISBN 978-1-5310-1175-8, Looseleaf 978-1-5310-2385-0, eISBN 978-1-5310-1176-5.
[24] Bold Patents, 'Patent Inventorship vs. Ownership: Distinctive Concepts' (Bold IP, https://boldip.com/bold-moves-patent-inventorship-vs-ownership-distinctive-concepts/, 10 November 2023).
[25]WIPO, "Patents" available at https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ind_adetula.pdf accessed on 22 March 2022.
[26]James & Wells, 'Champions of Innovation: Patent Inventorship and Ownership - What are the differences' (James & Wells, 3 May 2020) http://www.jamesandwells.com/wp-content/uploads/patent-inventorship-and-ownership-what-are-the-differences.pdf accessed 6 November 2023, pp. 1-3.
[27] Ibid
[28] Al Tamimi & Company, 'Patents: Inventorship vs Ownership' https://www.lexology.com/library/detail.aspx?g=d920c07f-9045-46a9-a73c-b3284e7d19d4 accessed 19 June 2024.
[29] Bold Patents, 'Patent Inventorship vs. Ownership: Distinctive Concepts' (Bold IP, https://boldip.com/bold-moves-patent-inventorship-vs-ownership-distinctive-concepts/, 10 November 2023).
[30] N. Shemtov, 'A Study on Inventorship in Inventions Involving AI Activity' (11 May 2022) https://www.epo.org/news-issues/in-focus/ict/artificial-intelligence.html#study accessed 6 November 2023, pp. 21-29.
[31] U.S. Code: Title 35 § 101 "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title"
[32] Hess v Advanced Cardiovascular Sys., Inc., 106 F.3d 976 (Fed Cir 1997), 979-980, cert denied, 520 U.S. 1277 (1997).
[33]P. Gattari, 'Determining Inventorship for US Patent Applications', available at https://agsci.oregonstate.edu/sites/agsci/files/main/research/vrc_release_inventorship-gattari.pdf accessed 6 November 2023.




DOI: 10.47505/IJRSS.2024.11.5

[34] Ibid
[35] Burroughs Wellcome Co v Barr Labs., Inc., 40 F.3d 1223 (Fed Cir 1994) 1227-1228.
[36] Ibid
[37]P. Gattari, 'Determining Inventorship for US Patent Applications', available at https://agsci.oregonstate.edu/sites/agsci/files/main/research/vrc_release_inventorship-gattari.pdf accessed 6 November 2023.
[38] Ibid
[39] Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456 (Fed Cir 1998) 1460, cert. denied, 525 U.S. 923 (1998).
[40] Trovan, Ltd v. Sokymat SA, 299 F.3d 1292, 1302 (Fed. Cir. 2002).
[41] Ibid
[42] World Economic Forum, 'Artificial Intelligence Collides with Patent Law' (White Paper), http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf accessed 11 May 2022, pp. 9-12.
[43] Ibid
[44] P. Albert, "USPTO Rules Artificial Intelligence Cannot Be Named As Inventor for Patent Application", available at https://www.dwt.com/blogs/artificial-intelligence-law-advisor/2020/05/uspto-ai-inventorship-ruling (11 May 2022), pp. 2-3.
[45] 734 F.3d at 1323, quoting Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1227-28 (Fed. Cir. 1994)
[46] Kingsley Egbuonu, 'The latest news on the DABUS patent case' (11 July 2023) https://www.ipstars.com/NewsAndAnalysis/The-latest-news-on-the-DABUS-patent-case/Index/7366.
[47] Ibid
[48] Ibid
[49] Article 60(1) EPC
[50] Article 60(1) EPC
[51] HFG Law & Intellectual Property, 'Artificial Intelligence and Inventions' (2022) http://www.hfgip.com/news/artificial-intelligence-and-inventions accessed 11 May 2022
[52] L. MacPhie and A. Dewan, '2019 Artificial Intelligence Year in Review' (2019) https://www.bereskinparr.com/doc/2019-artificial-intelligence-year-in-review accessed 11 May 2022.
[53] Imagination Engines Inc., 'Patent Listing' http://imagination-engines.com/iei_ip.php [https://perma.cc/N79N-NWEF] (last visited 11 May 2022) p. 1-4.
[54]Rule 13 of the Implementing Regulations of the Chinese Patent Law
[55] World Economic Forum (White Paper), Artificial Intelligence Collides with Patent Law available at http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf pages 9-12 accessed on (11/05/2022)
[56] Shanghai No. 1 Intermediate People's Court (2011) Hu-Yizhong-Minwu(zhi) -Chu-Zi No.1; a similar approach was applied in Guangzhou Intermediate People's Court (2012) Sui Zhong Fa Zhi Min Chu Zi-No.10.
[57] Ibid
[58]AIPPI China Report on Inventorship of Multinational Applications, 07-06-2015, Part II, Section 8 at http://aippi.org/wp-content/uploads/committees/244/GR244china.pdf.
[59] World Economic Forum (White Paper), Artificial Intelligence Collides with Patent Law available at http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf pages 9-12 accessed on (11/05/2022)
[60] Ibid
[61] Ibid
[62] Shenzhen Tencent v Yinxun case available at Is it a Work of Legal Entities? Available at http://ipkitten.blogspot.com/2020/01/another-decision-on-ai-generated-work.html p. 1 (11/05/2020)
[63] Ibid
[64] "Is it a Work of Legal Entities?" available at http://ipkitten.blogspot.com/2020/01/another-decision-on-ai-generated-work.html p. 1 (11 May 2022).
[65] AIPPI Japan Report on Inventorship of Multinational Applications, 07-06-2015, Part I, Section 1(b) at https://aippi.org/wp-content/uploads/committees/244/GR244japan.pdf
[66] AIPPI Japan Report on Inventorship of Multinational Applications, 07-06-2015, Part I, Section 1(b) at https://aippi.org/wp-content/uploads/committees/244/GR244japan.pdf.
[67] See Korean Patent Act (Act No. 950 of December 31, 1961, as amended up to Act No. 14112 of March 29, 2016)
[68] AIPPI Republic of Korea Report on Inventorship of Multinational Applications, 18-05-2015, Part I, Section 1(a) at https://aippi.org/wp-content/uploads/committees/244/GR244rep_of_korea.pdf
[69] World Economic Forum (White Paper), Artificial Intelligence Collides with Patent Law available at http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf pages 9-12 accessed on (11/05/2020)
[70] Ibid
[71]World Economic Forum (White Paper), Artificial Intelligence Collides with Patent Law available at http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf pages 9-12 accessed on (11/05/2022)
[72] Ibid



DOI: 10.47505/IJRSS.2024.11.5

[73] Jurist, "Legal News and Commentary" South Africa approves world's first patent with AI inventor - JURIST - News accessed on 22/03/2022
[74] Vorys, https://www.jurist.org/news/2021/08/south-africa-approves-worlds-first-patent-with-ai-inventor/ accessed on 22/03/2022
[75] Vorys, https://www.jurist.org/news/2021/08/south-africa-approves-worlds-first-patent-with-ai-inventor/ accessed on 22/03/2022
[76] Ibid
[77] Jason Rantanen, 'DABUS Gains Traction: South Africa Becomes First Country to Recognize AI-Invented Patent' (4 August 2021) https://patentlyo.com/patent/2021/08/traction-recognize-invented.html
[78] Adams & Adams, 'South African Patent Office's Recent Grant of a Patent for an Invention Created by Artificial Intelligence' (30 July 2021) https://www.adams.africa/intellectual-property/patents/south-african-patent-offices-recent-grant-of-a-patent-for-an-invention-created-by-artificial-intelligence/
[79] Ibid
[80] Vorys, https://www.jurist.org/news/2021/08/south-africa-approves-worlds-first-patent-with-ai-inventor/ accessed on 22/03/2022
[81] Thaler v Commissioner of Patents [2021] FCA 879 (Fed. Court of Australia 2021)
[82] 'DABUS Sent Back to Drawing Board Following Reversal in Inventorship Decision by Australia Court' (17 April 2022) https://www.ipwatchdog.com/2022/04/17/dabus-sent-back-drawing-board-following-reversal-inventorship-decision-australia-court/id=148464/ accessed 20/04/2023)
[83] Ibid
[84] Vorys, https://www.jurist.org/news/2021/08/south-africa-approves-worlds-first-patent-with-ai-inventor/ accessed on 22/03/2022
[85] Jurist, "Legal News and Commentary" South Africa approves world's first patent with AI inventor - JURIST - News accessed on 22/03/2022
[86] FindLaw, 'Sui Generis' (2023) <Sui Generis - FindLaw Dictionary of Legal Terms> accessed 07 November 2023.
[87] Kur, A. and Dreier, T.K. (2013) 'European Intellectual Property Law: Text, Cases and Materials'. Cheltenham: Edward Elgar, p. 323.
[88] Zatarain, J.M.N. (2017) p. 95
[89] Ibid
[90] Bently, L., et al. (2018), pp. 141 ss
[91] Abbott, R. (2016) 'I Think, Therefore I Invent: Creative Computers and the Future of Patent Law', p. 1086
[92] WIPO, 'Comments on Inventorship and Ownership of AI' (2020) available at https://www.wipo.int/org_intellectual_property_analysis_and_advocacy_centre.pdf accessed 3 February 2023
[93] Ibid
[94] Intellectual Property Owners Association, *Sui Generis Right for Trained AI Models* (2020).
[95] Pamela Samuelson, 'Evolving Conceptions of Copyright Subject Matter' (2016) 78 University of Pittsburgh Law Review 17, 66.



DOI: 10.47505/IJRSS.2024.11.5