

# AI as a Patent Inventor: A Comparative Analysis of Attitudes in Two Jurisdictions

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**Abstract:** *In the context of the digital age, the swift progression of artificial intelligence (AI) has provoked substantial debate regarding its position within the legal framework. This paper critically examines the legal status of AI, with a particular emphasis on its potential recognition as a patent inventor. Through a comparative analysis of judicial decisions in Australia and the United Kingdom, this study argues for the plausibility of AI being acknowledged as an inventor under patent law. The paper further explores the accompanying legal and ethical implications, offering a nuanced discussion of the challenges and considerations that such recognition may entail.*

**Keywords:** *Artificial Intelligence, Patent Law, Intellectual Property*

## 1. Introduction

Since the invention of computers, the question of whether machines can develop human-like intelligence has been a subject of debate. Is the human brain the sole vessel of the soul? How should humans treat machines that possess the capability to form minds? Should machines be accorded the same legal status as humans in certain areas of law, and could this pose a future threat to humanity?

As artificial intelligence (AI) continues to advance, the debate surrounding these questions grows increasingly significant. Computation is the most fundamental function of AI, but the autonomy of computation raises significant questions. Do the results generated by AI's autonomous computation, absent human intervention, belong to the AI itself? More specifically, can AI be recognized as the inventor of an invention?

This essay will compare the divergent legal perspectives on AI through case law from Australia and the UK, illustrating how these differing attitudes could lead to varying outcomes. In doing so, it will advocate for the recognition of AI as inventors, while also addressing the potential legal and ethical challenges that may arise.

## 2. Different judgments in the same case

### 2.1. Australian judgment

The Australian courts have provided a groundbreaking ruling. On 30 July 2021, the Federal Court of Australia ruled that an artificial intelligence (AI) system or device can qualify as an inventor under the Patents Act 1990. This marks the first instance in which AI has been legally recognized as an inventor in such a case. The case of *Thaler v Commissioner of Patents* [2021] FCA 879 was initiated by Dr. Stephen Thaler<sup>[1]</sup>, seeking legal recognition of his AI creation as an inventor under patent law. He described his AI invention as the Device for the Autonomous Bootstrapping of Unified Sentience (DABUS).

Dr. Thaler posits that DABUS, a neural network akin to the human brain, possesses the capability to generate novel concepts. Moreover, DABUS is capable of autonomous learning, independent of human intervention. Leveraging its human brain-like learning capabilities, Dr. Thaler asserted that DABUS independently designed new inventions and subsequently applied to the Patent Office for DABUS to be recognized as a patented inventor. However, the Deputy Commissioner of the Patent Office rejected Thaler's application, citing Regulation 3.2C(2)(aa) of the Patents Regulations 1991 (Cth)<sup>[2]</sup>, which mandates that a real name must be provided when applying to be recognized as an inventor. DABUS, being an AI system, could not fulfill this requirement. Following the rejection, Dr. Thaler sought

judicial review in the Federal Court of Australia.

### **2.1.1. AI is eligible to be an inventor**

Judge Beach of the Federal Court of Australia ruled in favor of Thaler, reasoning that the law does not explicitly exclude AI from the right to be recognized as an inventor, despite the patent law's stipulation that patents can only be granted to natural persons and that patent applicants must also be natural persons. In the twelfth paragraph of his judgment, Judge Beach identified the Deputy Commissioner's error as conflating ownership with control of the patent. The issue at hand was distinguishing between who could be recognized as the patentee of an invention and who could be considered its inventor. It is evident that only natural and legal persons can hold property rights, as they are legal entities with the capacity to possess, use, benefit from, and dispose of property. In contrast, AI, being a form of property, lacks such capacities. However, the inability of AI to serve as a patentee does not preclude the possibility of AI being an inventor. This is due to the differing competencies required to be an inventor versus a patentee.

### **2.1.2. The inventor's focus is on "invent"**

In Section 10 of the judgment, Judge Beach posited that the term "inventor" functions as an agent noun, referring to the source of the invention rather than restricting that source to human beings. Similarly, the term "creator" is often interpreted as referring to a divine being rather than a human, emphasizing the act of creation rather than the creator's identity. Judge Beach argued that the Deputy Commissioner's interpretation of "inventor" was overly literal and failed to account for the evolving definition of the term brought about by advancements in AI technology.

### **2.1.3. Purpose of the Patents law**

The inclusion of artificial intelligence within the scope of the term inventor is also consistent with the legislative intent of the patent law in section 2A of the Patents Act: ".....to provide a patent system in Australia that promotes economic wellbeing through technological innovation and the transfer and dissemination of technology<sup>[3]</sup>."

The primary objective of patent law is to foster the advancement and dissemination of technology to enhance economic welfare. The origin of the inventor, whether human or not, is irrelevant to this goal. Given this purpose, the law should promote the disclosure and dissemination of patented technology by including as many inventions as possible within the ambit of patent protection<sup>[4]</sup>, rather than serving as a barrier. Therefore, recognizing AI as an inventor aligns with this objective and is legally justifiable.

### **2.1.4. The Deputy Commissioner's view**

The Deputy Commissioner's point of concern was that treating AI as an inventor would affect the identification of the patentee in property law. The Deputy Commissioner proposed that under section 15(1) of the Patents Act:

"a patent for an invention may only be granted to a person who:

- (a) is the inventor; or
- (b) would, on the grant of a patent for the invention, be entitled to have the patent assigned to the person; or
- (c) derives title to the invention from the inventor or a person mentioned in paragraph (b); or
- (d) is the legal representative of a deceased person mentioned in paragraph (b)."

Under Section 15(1), the Deputy Commissioner asserted that the inventor is the origin of patent rights, and if the inventor does not transfer these rights, the inventor remains the patentee. However, in the present case, the Deputy Commissioner contended that if DABUS were recognized as an inventor, the patent rights held by DABUS, upon becoming a patentee, could not be transferred under Sections 15(1)(b) and (c) or succeeded to under 15(1)(c) due to DABUS's status as a non-person. Consequently, its status as a patentee would be rendered ineffective.

However, the flaw in the Deputy Commissioner's reasoning lay in conflating the rights of the inventor with those of the patentee. The right of assignment pertains to the patentee, not the inventor, and Judge Beach argued that the term "inventor" does not necessarily imply "patentee." Utilizing the analogy of a fruit tree and its fruit, Dr. Thaler likened the invention to the fruit produced by DABUS. Consequently, Dr. Thaler, as the owner of DABUS, inherently acquired the patent rights without the

necessity of an assignment.

## **2.2. The UK judgement: *Thaler v Comptroller General of Patents Trade Marks and Designs [2021] EWCA Civ 1374***

Dr. Thaler faced similar issues when applying for a patent for a DABUS invention in the UK as he did in Australia. Dr. Thaler's patent application to the UK Intellectual Property Office (IPO), which designated DABUS as the inventor, was deemed withdrawn by the IPO due to the absence of a qualifying inventor. In the Court of First Instance, Judge Marcus Smith affirmed the IPO's decision, reasoning that both the applicant and the patentee in the Yeda case were required to be natural persons<sup>[5]</sup>, thus necessitating that the inventor also be a person. Additionally, the IPO contended that Dr. Thaler was not entitled to apply for these patents since he himself was not the inventor<sup>[6]</sup>. The Court of Appeal judges determined that the primary statutes relevant to Thaler's case were Sections 7(2), 7(3), and 13(2) of the Patents Act 1977<sup>[7]</sup>, and identified the core issues as follows:

### **2.2.1. *DABUS is not a person and therefore cannot be an inventor***

S7 (2) states that: A patent for an invention may be granted

(a) primarily to the inventor or joint inventors;

(b) in preference to the foregoing, to any person or persons who..... was or were at the time of the making of the invention entitled to the whole of the property in it (other than equitable interests) in the United Kingdom;

(c) in any event, to the successor or successors in title of any person or persons mentioned in paragraph (a) or (b) above or any person so mentioned and the successor or successors in title of another person so mentioned; and to no other person.

The judges adopted the Oxford English Dictionary definition of "inventor," defining it as "a person who devises; a contriver, a planner, an inventor<sup>[8]</sup>." The judges were unanimous in their view that an inventor must be a human being. They held that the sole provision of the 1977 Act that confers patent rights is Section 7, which they interpreted as conferring rights exclusively to human beings rather than machines. Therefore, the fundamental premise of Section 7 is that the applicant must be a human being. Specifically, Section 7(1) explicitly stipulates that the applicant must be a person, while Section 13(2)(a) mandates that the inventor must also be a person.

### **2.2.2. *Thaler cannot be granted the patent***

Dr. Thaler contended that he had not contributed substantially to the invention and thus could not qualify as an inventor under Section 7(2)(a). Furthermore, since DABUS was not a person, he could not be considered a successor to DABUS under Section 7(2)(c). As the only viable alternative, Dr. Thaler sought to obtain a patent under Section 7(2)(b), arguing that, as the owner of DABUS, he was entitled to claim the "fruits" of DABUS based on the right in rem.

However, this argument was rejected by Lord Justice Arnold, who contended that the "fruit" analogy applied solely to tangible property and could not extend to intangible property, which cannot be separately owned because only tangible property is inherently exclusive. A patent constitutes an exclusive property right, and if it loses its exclusivity, it forfeits its foundational basis. Lord Justice Arnold further held that a patent, being an intangible property, does not possess exclusivity in its existence. Moreover, an invention fundamentally represents a piece of information, and information itself is not classified as property<sup>[9]</sup>.

### **2.2.3. *UK IPO correctly responds to Dr Thaler's patent application***

The IPO considered Dr Thaler's withdrawn patent application under section 13(2)(b) of the Patents Act 1977:

"...where the applicant is not the sole inventor or the applicants are not the joint inventors, indicating the derivation of his or their right to be granted the patent; and, if he fails to do so, the application shall be taken to be withdrawn."

The 1977 Act also refers to the term "inventor," and the judges concluded that this definition must align with the concept outlined in Section 7. Specifically, the inventor must be a natural person. In this instance, since Dr. Thaler did not regard himself as the inventor, he listed DABUS as the inventor on his application form. However, the AI did not meet the Section 7 requirement that the inventor must be

a natural person. Consequently, the IPO determined that Dr. Thaler, as the applicant, could not rely on the claim source and concluded that Dr. Thaler had withdrawn his application under Section 13(2)(b).

Consequently, neither DABUS nor Dr. Thaler was able to secure patent protection for the invention. Despite this situation, and although Australian jurisprudence already recognizes AI as inventors, the judges emphasized the necessity of applying the current UK patent law, even if it meant that the invention would remain unprotected, as the decision was not intended to address what the law should be.

### **3. Discussion: Should AI be the inventor?**

#### **3.1. What is AI**

To discuss AI effectively, one must first understand what artificial intelligence entails. The term “artificial” is largely uncontroversial and refers to things created by humans. However, the term “intelligence” presents a more complex concept. Michael Haenlein defines intelligence as “the ability to interpret external data correctly, to learn from it, and to use this knowledge through flexible adaptation to achieve specific goals and tasks<sup>[10]</sup>.” This definition emphasizes the functional aspects of AI, highlighting its ability to adapt to environmental changes, which is recognized as a core function of AI.

Additionally, the question “Can machines think?” proposed by Alan Turing in October 1950 has become a prevalent topic of discussion<sup>[11]</sup>. Turing posited that a machine could be deemed to possess human-like intelligence if it could convince more than 30% of its interlocutors that they were conversing with a human. This concept is known as the Turing test. As of 2014, a program named Eugene Goostman had successfully passed the Turing test. Although this level of intelligence is still far from genuine thought, the increasing computational power of computers means that it is premature to conclude that machines cannot eventually develop human-like cognition.

David Eagleman, a neuroscientist and scientific advisor for Westworld, argues that human consciousness arises from the brain’s algorithms, which AI can learn, whereas sensory perception is more straightforward to replicate. Professor Chella from the University of Palermo in Italy developed the CiceRobot research project. Cice is capable of generating logic by simulating human consciousness, which leads to a cognitive structure for self-awareness.

Therefore, AI can, at a minimum, generate self-awareness through algorithms. It is important to clarify that self-awareness in AI does not imply the development of human emotions or confer human or legal person status. This essay focuses solely on whether AI can be an inventor, not whether it qualifies as a person.

Self-awareness is crucial as it is a prerequisite for an AI to be recognized as an inventor under patent law. This distinction sets AI apart from ordinary computers. For the law to recognize AI as an inventor for patent purposes, the AI must at least be aware of its invention; otherwise, such recognition lacks practical significance. Similarly, the law does not need to grant employee status under labor laws to a floor-sweeping robot, as it cannot comprehend its actions. Most jurisdictions that reject AI as an inventor fail to recognize this distinction and instead view AI merely as a more advanced machine.

#### **3.2. Eligibility to become an inventor**

Most conservative jurisdictions, including the UK, the US, the EU, and China, refuse to recognize AI as an inventor on the grounds that the law requires inventors to be natural persons. While this strict adherence to the letter of the law might seem reasonable, applying an outdated rule to evaluate a new and evolving technology is problematic.

The reasons for rejecting DABUS as an inventor are quite similar across these jurisdictions. They argue that DABUS, being a non-natural person, cannot manage or protect patent rights effectively and thus cannot hold property rights like a human being. Consequently, they see no need to recognize it as an inventor. However, this perspective is short-sighted, as the current capabilities of AI do not necessarily reflect its future potential.

##### **3.2.1. Comparing AI to animals**

This decision was justified because Naruto did not have the awareness or intent when the photo was

taken<sup>[12]</sup>; it merely pressed the shutter by accident. In copyright law, the author of a photograph is expected to make an effort in composition, lighting, and other aspects. Naruto did not meet these requirements. Additionally, Naruto's right to its own likeness is not applicable because such rights are reserved for humans, and animals cannot understand or exercise such rights. Since Naruto is a wild animal living in a nature reserve, recognizing its property rights is impractical, as it cannot exercise them. Therefore, granting intellectual or moral rights to animals is not feasible because they lack the capacity to acquire and exercise property rights.

However, this theory primarily applies to animals whose intelligence is not yet understood to be comparable to human expression. This is not the case with AI. Despite being at an early stage of development, AI has the potential to surpass human intelligence in the future and is already capable of expressing itself in ways that humans can understand, such as through language and text.

### 3.2.2. Comparing AI to human beings

By analogy, does the fact that minors are not fully capable of managing their property imply that they do not have property rights? Clearly, minors do have property rights, although they require varying levels of management and assistance from guardians due to their limited cognitive abilities. This does not prevent them from owning property.

Similarly, if a minor makes a new invention through their own ingenuity and effort, the patent office does not refuse to grant inventorship based on the minor's age. Patent law does not impose an age limit for inventors.

The deeper legislative purpose of patent law is to encourage the dissemination and development of technology, ensuring that those who make significant contributions to inventions receive their due rights, thereby promoting the economic welfare of society. In the DABUS case, Dr. Thaler emphasized that he did not contribute to the invention directly and thus did not wish to be listed as the inventor. Despite creating DABUS, he did not contribute materially to the patent application and chose not to claim inventorship.

In *JMVB Pty Ltd v Camoflag Pty Ltd*<sup>[13]</sup>, Crennan J stated that inventorship is determined by an objective assessment of the contribution to the invention as a whole, not just the initial idea. If the invention would not have been created without a particular person's involvement, that person is entitled to be recognized as the inventor. If this criterion is applied, DABUS qualifies as an inventor.

### 3.2.3. Impact on property rights

The main argument against recognizing AI as an inventor is that AI is not a human being, and granting patents to non-human entities could lead to confusion regarding ownership and patent rights. Critics worry that this could create complexities in determining who owns the patent rights and whether AI's results should be attributed to the AI's owner.

In the English case, Dr. Thaler argued that under the common law principle of accession, as outlined in Blackstone's *Commentaries on the Laws of England* (1766)<sup>[14]</sup>, he, as the owner of DABUS, should be entitled to the patent for inventions made by DABUS. According to this principle, ownership of the AI would mean ownership of the patents it generates, and there should be no restrictions on assigning these patents.

Arnold LJ, however, refuted this perspective, asserting in paragraphs (131)-(137) of the judgment that the Blackstone doctrine pertains solely to new tangible property emerging from pre-existing tangible property. However, this doctrine could not be applied to intangible property, as intangible property cannot be exclusively appropriated. Therefore, Dr. Thaler did not possess a natural right to patent a new invention solely based on his ownership of DABUS.

The validity of Arnold LJ's reasoning is grounded in the acknowledgment of the intangible nature of artificial intelligence. Since AI fundamentally consists of algorithms rather than tangible objects, it cannot be considered exclusive. This contrasts with the emergence of Bitcoin and Non-Fungible Tokens (NFTs), which facilitate the trading of virtual art in an exclusive manner. However, this type of transaction achieves exclusivity through encoding and materializing the virtual artwork. In contrast, unlike virtual artworks, physical artefacts cannot be precisely delineated in the same manner.

AI represents a form of computing rather than a fixed string of code akin to a virtual artefact. It fundamentally serves as a method for processing information or material<sup>[15]</sup>. This processing approach derives from emulating human cognitive processes. Consequently, through its computational approach, AI can produce varying responses based on different inputs from users. Such imitation may be

patentable, though humans cannot claim ownership of it.

This theory complicates the determination of patentability, leading to the conclusion in Thaler's case in England that Dr. Thaler could neither assert invention rights for DABUS nor apply in his own name to patent the invention. As a result, the invention remained in a detrimental state of being unprotected. The English judge interpreted this scenario as a *de facto* legal situation that necessitated application.

There appears to be a loophole in patent law that results in the rejection of inventions deserving of protection. This loophole arises from Arnold LJ's characterization of AI as an intangible asset despite its true nature as a computational method or mathematical model, akin to a formula rather than a tangible asset. Consequently, while ownership of an algorithm itself may not be feasible, this does not preclude the determination of intellectual property (IP) ownership. The principle of acquisition in property law, which grants rights to the first finder of unclaimed property, could be applied here. Under this principle, the initial discoverer of an AI invention could be awarded a patent based on their discovery<sup>[16]</sup>. While determining patent rights based on discovery may seem unconventional, it offers a more viable solution compared to leaving the invention unprotected.

Moreover, in such cases, the discoverer of an AI-related patent could potentially be an intern at a company or an external visitor. Since the criteria for being recognized as a discoverer are less stringent than those for inventorship, this approach facilitates the identification of more patentable inventions and ensures a greater influx of innovations into the public domain. The preceding arguments rely on the premise that AI is not recognized as an inventor.

### ***3.2.4. The Nature of Artificial Intelligence***

In light of the preceding discussion, arguments against granting AI inventor status persist in perceiving AI merely as a tool. Conversely, Australian Judge Beach, who endorsed the recognition of DABUS as an inventor, utilized paragraphs (16)-(43) of his judgment to elucidate the operational mechanisms of DABUS. He concludes that DABUS is not merely a brute force calculator but has advanced to a stage of deep learning by emulating the human brain, thereby generating novel information. It is crucial to recognize that AI represents a fundamental departure from previous inventions. While AI can assist humans in their tasks, it transcends the role of a mere tool. Given its design to emulate the human brain, AI could potentially think like a human, gain self-awareness, and effectively communicate its results to humans; a more audacious perspective even suggests that AI might develop human-like emotions.

Within the framework of patent law, a more suitable approach for such a machine possessing a degree of autonomy would be to consider AI as more akin to a human being rather than a mere tool, potentially recognizing it as an inventor. Such recognition would not equate AI with humans in other legal contexts but would address gaps in patent protection and prevent the issuance of patents that lack legal safeguarding<sup>[17]</sup>.

### ***3.2.5. The purpose of patent law***

Patent law embodies a *quid pro quo*: in exchange for a monopoly granted and enforced by the state. In *Attorney-General (Cth) v Adelaide Steamship Co (1913) 18 CLR 30, 32*<sup>[18]</sup>, Lord Parker described this as the 'consideration for the transfer to the public'. This consideration reflects the fundamental economic attribute of a patent, wherein the primary significance to the patentee is the potential for monopoly gains over a specified period.

While AI itself may not be motivated by monopoly interests, its investors certainly are. Therefore, by moving beyond the belief that only humans can invent and granting AI inventor status, we could encourage greater investment in AI, leading to the creation of more patents and further advancements in human technology.

## **4. Conclusion**

A comparative analysis of the Australian and UK decisions in the DABUS case reveals divergent views on the legal status of AI under current law. The UK employs a stringent legalistic interpretation to exclude AI from personhood, while Australia has recognized AI as an inventor by examining the legislative intent. Australian rulings have established that dictionary interpretation cannot replace legal interpretation and that the fundamental aim of patent law is to safeguard patents and foster technological advancement and societal well-being. Since the current law does not explicitly exclude

AI from being an inventor, and given that AI is capable of generating inventions, it should be recognized as an inventor.

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