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Patent Protection Of Inventions Created By Artificial Intelligence Under The United Kingdom Law And Vietnamese Law

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ABSTRACT

Background: Artificial intelligence (AI) advances have been used in many areas of life, thanks to its algorithmic capabilities, the size of data, and the power of computing. However, AI has many implications for intellectual property law, especially patent issues. An international lawsuit filed by Stephen Thaler et al. (creators of the DABUS AI machine) in a patent class focused on whether an inventor needs to be a human. DABUS is capable of generating inventions without human input. Dr. Thaler has applied patent applications in the UK and other jurisdictions since 2018. Judgments by the competent authorities of these jurisdictions have clarified the views of current patent law regarding the protection of creative results created by AI. This article examines UK regulations on the protection of AI inventions. It explores the views of the UK competent authorities on applying law from the practice of judgments related to the DABUS case. The article also analyzes the Vietnamese law. The article summarizes the spirit of the current law on protecting inventions created by AI.

Methods: The article uses an analytical method to clarify the legal provisions related to the conditions of protection and the procedures for patent registration. The analytical method helps indicate whether AI's invention can be protected under current patent regulations. This method is used to analyze the legal provisions of the United Kingdom and Vietnamese law on the standards for protecting an invention, especially determining the author of the invention.

The article also uses the comparative method. This method is mainly used to compare EU law and Vietnamese law related to the provisions on conditions for patent protection and patent protection procedures. Combined with the above analytical method, the comparative method shows the similarity between UK patent law and Vietnamese patent law on the issue of protecting inventions created by AI.

Results and conclusions: The paper concludes that, under current UK law, inventors must be individuals, not machines. The owner of a machine does not have the independent right to patent any technical advances it makes. The courts have not prevented a person from claiming to be an inventor when using AI to create an invention. The Court also did not consider whether technical advances made by machines operating autonomously and assisted by AI are patentable. Compared with UK law, Vietnamese law has some similarities, especially in the requirement that the inventor of the invention must be a human. The article expresses sympathy with these views.

Keywords: Inventions, Artificial Intelligence, Law

1. INTRODUCTION

The European Commission states that intangible assets such as patents form "the foundation of today's economy."[1] Despite the technological advances of AI and the increasing contribution of AI to the creative process, intellectual property law, in general, and patent law, in particular, still seem to be human-centric in determining whether an invention is patentable or not. While human creativity plays a vital role in the perspective of patent law, where humans can use intelligent machines to enhance their thinking process, this still leaves unanswered questions about whether machines can completely replace human creativity.

There are currently three largest AI markets in the world. One is the United States, the second is China, and the third is the United Kingdom. The UK AI market is estimated to be worth over £16 billion, and this figure is expected to increase significantly to over £75 billion, at least in the next 10 years. This explains why the UK Government's AI White Paper 2023 and the AI Safety Summit have identified AI as a key element of the innovation strategy.[2]

An international lawsuit filed by Stephen Thaler et al. (creators of the AI machine DABUS) in a patent pool focused on whether an inventor needs to be a human. The birth of DABUS marked a turning point, proving the ability of autonomous AI systems to

[1] European Commission (2020), *COM(2020) 760 final*, p. 1, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0760, accessed November 7, 2024

[2] Vlasova and McLaughlin (2024), *UK Supreme Court confirms AI cannot be an inventor under UK patent law*, https://www.mishcon.com/news/uk-supreme-court-confirms-ai-cannot-be-an-inventor-under-uk-patent-law, accessed November 7, 2024.

operate independently. The owner of the DABUS AI system claimed that this system can create inventions independently without human creative intervention. DABUS can make predictions automatically. First, it can link simple and independent concepts to form a more complex concept. Then, DABUS will automatically activate a series of ideas, combined with its memories, to produce the result. Furthermore, it can consider the novelty of its inventions through neural networks. DABUS will report to its owner, Dr. Thaler, the presence of novel concept chains in its inventions.[3] DABUS's autonomous initiator is an AI system that is supposed to be autonomous. So far, the device has produced two innovative results: a fractal-based beverage container that improves safety during transportation and an emergency beacon that flashes in a pattern that simulates neural activity to attract attention better. Since 2018, Dr. Thaler has asked countries (including the UK) to grant patents for AI inventions. In the patent application, Dr. Thaler identifies the DABUS AI system as the author of the invention.[4] The rulings by the UK authorities in these jurisdictions have clarified the position of current UK patent law regarding the protectionability of AI-generated innovative results.

2. METHODOLOGY AND RESEARCH METHODS

The current legal analysis focuses on the legal provisions of the United Kingdom and Vietnamese law relating to the conditions for the protection of inventions and the procedures for registering a patent. The legal analysis also focuses on the judgments of the competent authorities of the United Kingdom, including the UKIPO, the Supreme Court, and the Court of Appeal. This method includes a legal approach at the entry stage into force of the current law. Specifically, although the laws of the UK and Vietnam do not specify that only a human invention is protected, the registration procedure requires that the application for protection must specify that at least one inventor of the invention must be a human. The analysis considers the current EU framework, mainly the UK Patent Act 1977, the Vietnam Intellectual Property Law promulgated in 2005 (last amended in 2022), and its implementing guidelines. The hypothesis is that an invention created by AI cannot be protected under current intellectual property law.

3. OVERVIEW OF AI AND ITS ABILITY TO CREATE INVENTIONS

AI does not have a universally accepted definition. The European Commission defined it in its 2008 Communication on "Artificial Intelligence for Europe" as follows: "*Artificial intelligence (AI) refers to systems that exhibit intelligent behavior by analyzing their environment and taking actions – with some degree of autonomy – to achieve a specific goal*."[5] AI can be understood a as "*the ability of a digital computer or computer – controlled robot to perform tasks typically associated with intelligent organisms*."[6]

In September 2022, the UKIPO published further guidance for serving patent applications for inventions created in connection with AI. This guidance is part of the AI and IP 2021 "call for view" and builds on recent legislative understanding. The UKIPO defines AI as "technology capable of performing tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and language translation." The guidance is designed to provide applicants with greater clarity on how patent law applies to inventions generated by AI and to help them assess their patentability, along with examples and case studies. It also explains that inventions defined as mathematical methods and computer programs are not eligible for patent protection under UK intellectual property law.

In addition to the essential criteria of an invention, such as novelty, inventive step, and industrial applicability, the new UKIPO guidance also shows that an AI system can be an invention if it makes a technical or technological contribution.

An AI invention is considered a technical contribution if its instructions embody a technical process or solve a technical problem, provided that these contents exist outside the computer. An AI invention is also considered if it is capable of solving a technical problem within the computer itself or operating the computer in a new way.

One would not determine that an AI discovery has made a technical contribution if its results relate only to subject matter excluded from the scope of

[3] Perma (2023), *DABUS Described*, https://perma.cc/Q2SY-B2W3 , accessed November 7, 2024.

[4] Ryan Abbott (2023), *The Artificial Inventor Project*, https://artificialinventor.com/patent-applications/, accessed November 28, 2024.

[5] European Commission (2018), *Legal provisions of COM(2018)237 - Artificial Intelligence for Europe,* https://www.eumonitor.eu/9353000/1/j4nvhdfcs8bljza_j9vvik7m1c3gyxp/vknuqttbx4zb, accessed November 7, 2024.

[6] Copeland, B. J (2019), "Artificial Intelligence - Alan Turing and the Beginning of AI", *Encyclopedia Britannica*, www.britannica.com/technology/artificial-intelligence/Alan-Turing-and-the-beginning-of-AI, accessed November 7, 2024.

patent protection listed as excluded (e.g., business methods) and nothing else, or (ii) relate only to the work of processing or manipulating information or data and nothing else, or (iii) are simply a computer program but with better-written functionality and without any additional features.

4. THE UK LAW ON PATENTABILITY FOR INVENTIONS CREATED BY AI

4.1. On protection conditions and protection procedures for inventions created by AI

4.1.1. About protection conditions

The UK Patents Act 1977, the most recent amendment in 2024, is the UK's key legislation governing patents.[7]

In Section 1, the UK Patents Act provides that a patent shall only be granted for an inventive result which satisfies the following conditions:

First, the invention is novel. An invention is considered novel if it does not form part of the existing prior art. The prior art, in the case of an invention, is considered to include all matter that has been disclosed to the public by written or oral description, by use, or in any other way before the priority date (under Section 2 of the Patents Act).

Second, The technical solution involves an inventive step. A technical solution is considered to involve an inventive step if it is not apparent to a person skilled in the art, having regard to any matter forming part of the prior art solely by the said novelty (under Section 3 of the Patent Act).

Last, that technical solution is capable of industrial application. A technical solution is capable of industrial application if it can be created or used in any industry, including agriculture.

Section 2 of the Patents Act also excludes specific subject matter from being patentable, including (i) a scientific discovery, theory, or mathematical method; (ii) a literary, dramatic, musical, or artistic work or any other aesthetic creation; (iii) a plan, rule or method for performing a mental act, playing a game or doing business, or a program for a computer; (iv) a way of presenting information. These provisions suggest that an AI-generated invention is not excluded from the subject matter that can be protected as an invention. Therefore, regarding eligibility, UK patent law is generally unclear whether an AI-generated invention can be protected.

Section 7(3) of the UK Patents Act 1977 states, "*in this Act, The creator is concerned with a creative result, meaning the actual creator of the invention, and co-creator is to be understood accordingly*."

Regarding AI-related inventions, patent law takes a technology-neutral approach, treating them like any other invention. This means that AI-based innovations are not automatically excluded from patent protection. In line with TRIPs, these provisions require that patents be granted only if they meet the requirements of novelty, inventiveness (also known as non-obviousness), and industrial applicability. Based on these criteria show that an AI-generated invention can be protected as an invention if it fully meets the requirements of the conditions for protection.

3.1.2. About protection procedures

Section 7 of the Patents Act defines patent rights. Sections 7(1) and 7(2) confer the right to apply for and obtain a patent on any *person* who is:

- Creator or co-creator (Article 7(2)(a));
- Has a legal right to the entire property in the invention (the most common example is the employer-employee situation, where the employer owns the employee's creative product) (Article 7(2)(b)); or
- Any successor listed above.

The language of these provisions implies that a "person" is an individual for the purposes of Article 7(2)(a) and a legal entity to file a patent application under Article 7(2)(b). Therefore, such technical solutions designed by machines were not the intended subject matter of the law at the time of its enactment.

Section 13(2) of the Patents Act requires that a statement be filed with a patent application stating that the applicant believes himself to be the inventor. The 1977 Act defines "inventor" as "a person who makes an invention." However, the Act does not say that a person cannot make an invention with the assistance of a machine. In principle, there is no reason why inventions made with the assistance of an AI system as a tool cannot be patented as long as the named inventor remains an individual. However, questions may arise in future cases as to how much a person must contribute to an invention through his or her work to be considered an inventor or inventor and whether an individual should be considered an inventor if the inventive step is achieved solely or principally through the operation of an AI system.

4.2. UK authority's decision on AI-generated invention

In 2018, AI researcher Dr. Stephen Thaler filed two patent applications with the Comptroller General, claiming that the inventor was a machine called DABUS (Autonomous Actuator of Unified Sensing),

[7] UK Patents Act (1977), https://www.legislation.gov.uk/ukpga/1977/37/contents , accessed November 7, 2024.

which operates autonomously and is powered by AI. He asserted that he had the right to the patent through his machine ownership.

4.2.1 Decision of the United Kingdom Intellectual Property Office (UKIPO)

The UKIPO has addressed whether a non-human inventor can be considered an inventor under current patent law, primarily the Patents Act 1977. The UK Intellectual Property Office (UKIPO) concluded that only a natural person qualifies as an inventor under current patent law, and therefore refused a patent application for the results produced by the DABUS AI system. The UKIPO relied on sections 7 and 13 of the Patents Act 1977.

Under Section 13(2)(a) of the UK Patent Act, an applicant must identify specific human beings alleged to be an invention's inventors. The UKIPO, therefore, concluded that patent law does not allow non-humans to be identified as inventors. Even if an AI machine were identified as the inventor of an invention, the applicant (or the owner of the AI system) would not be able to own or transfer the invention. The UKIPO argued that Dr Thaler clearly identified DABUS as an AI machine, not a human being, and therefore, the authority could not consider DAUS to be a 'human being' under the Act.[8] UKIPO notes that the current patent law was enacted without considering the issue of AI inventions. UKIPO states that it is clear that the legislators intended a 'person' to be a natural person, according to the Patents Act 1977. UKIPO points out that a change in the interpretation of the inventor would need to be deliberate and dictated by the legislators or the higher courts, which does not currently exist. As such, the United Kingdom Intellectual Property Office (UKIPO) rejected Dabus' patent application because only humans can be considered creators.[9]

4.2.2. Decisions of the Supreme Court and the Court of Appeal

In September 2020, the UKIPO decision was heard by the United Kingdom Supreme Court (UKSC). The Court upheld the decision made by the UKIPO.[10] The United Kingdom Supreme Court (UKSC) supported the UKIPO decision, concluding that a patent application naming an AI machine as the inventor rather than an individual is invalid. The UKSC concluded that the language of the provisions implied that a "person" was an individual to determine the inventor under section 7(2)(a) and a legal entity to file a patent application under section 7(2)(b) of the Patents Act 1977. Since AI is not *a person*, the DABUS AI system cannot be considered *an inventor* under the law. The Court held that the key issue lay in section 13 of the Patents Act 1977. Section 13 requires the applicant to designate "the person or persons they believe to be the inventor or inventors" (Section 13(2)(a) Patents Act 1977). The Court also cited the House of Lords' judgment in Yeda Research & Development Co. Ltd. v. v Rhone-Poulenc Rorer International Holdings as the basis for the conclusion that the inventor must be human. In the Yeda case, Lord Hoffman referred to the inventor as the natural person who invented the inventive concept. Justice Smith also held that the patent rights could not be transferred to Dr. Thaler (the owner of the AI system DABUS) under section 7(2)(b) or (c) of the Patents Act 1977 because DABUS was not a natural person and therefore could not hold and transfer property.

Dr Thaler appealed the Supreme Court decision, and the UK Court of Appeal handed down a new judgment in September 2021.[11] All three judges agreed with the Supreme Court's conclusion that an inventor must be a human being, systematically interpreting the 1977 Act to conclude that "only an individual can be an 'inventor.'" The UKSC concluded that the language of these provisions implied that a 'person' was an individual for article 7(2)(a) and a legal entity for a patent application under article 7(2)(b) and that machine-designed inventions were not the intended subject matter of the law at the time of its enactment.

On the issue of whether Thaler could still own any inventions made by DABUS and be entitled to apply for a patent in respect of those inventions based on his DABUS ownership, the Court ruled against Thaler. The Court ruled that the ownership of the machine did not fall within one of the branches of Section 7 (2) (b) or 7 (2) (c).

[8] The UK Intellectual Property Office (2019), *Decision BL O/741/19*, p. 14, https://www.ipo.gov.uk/p-challenge-decision-results/p-challenge-decision-results-bl?BL_Number=O/741/19, accessed November 7, 2024.

[9] Norton James (2020), *EPO and UKIPO Refuse AI-Invented Patent Applications*, IP Watchdog, https://www.ipwatchdog.com/2020/01/07/epo-ukipo-refuse-ai-invented-patent-applications/id=117648/, accessed November 29, 2024.

[10] The Court of Appeal (2020), *A3/2020/1851 Thaler v. Comptroller*, p. 18-26, https://www.judiciary.uk/judgments/thaler-v-comptroller/, accessed November 7, 2024.

[11] The Supreme Court (2021), *Thaler v. Comptroller Gen. of Pats., Designs & Trade Marks [2021] EWCA (Civ) 1374*, https://www.supremecourt.uk/cases/uksc-2021-0201, accessed November 7, 2024.

5. VIETNAMESE LAW ON THE PROTECTION OF INVENTIONS CREATED BY AI

5.1. About protection conditions

According to Article 58 of the 2005 Law on Intellectual Property, an invention is protected as a Patent if it meets the following conditions: It is new; It has a creative level; It is capable of industrial application.

The Law Amending and Supplementing several Articles of the Law on Intellectual Property 2022 (hereinafter referred to as the Amended Law on Intellectual Property 2022) has made several adjustments to the detailed content of the novelty conditions of inventions. Clause 19, Article 1 of the Amended Law on Intellectual Property 2022 stipulates that an invention is considered novel if it does not fall into one of the following cases:

Firstly, it is publicly disclosed in the form of use, written description, or any other form domestically or abroad before the filing date of the patent application or before the priority date in case the patent application enjoys priority;

Second, it is disclosed in another patent application with an earlier filing date or priority date but published on or after its filing date or priority date.

An invention is considered not yet publicly disclosed if only a limited number of people know about it and are obliged to keep it secret (Clause 2, Article 60 of the 2005 Law on Intellectual Property).

In Clause 2, Article 2 of the Law on Amending and Supplementing several Articles of the Law on Insurance Business, the Law on Intellectual Property 2019 (amended and supplemented by Point c, Clause 82, Article 1 of the Law on Intellectual Property 2022) stipulates that an invention is not considered to have lost its novelty if it is publicly disclosed by the following subjects, provided that the patent application is filed in Vietnam within 12 months from the date of disclosure:

First, the author creates the invention, industrial design, and layout design with his efforts and expenses;

Second, organizations and individuals that invest funds and material means for authors in the form of assigning work or hiring work; organizations and individuals assigned to manage genetic resources provide genetic resources and traditional knowledge about genetic resources according to contracts for access to genetic resources and benefit sharing unless otherwise agreed by the parties;

Third, the organization in charge of inventions that are the result of scientific and technological tasks uses the entire state budget;

Fourth, the organization in charge of inventions, industrial designs, and layout designs results from scientific and technological tasks invested by many sources of capital, including a part of the state budget. The right to register inventions, industrial designs, and layout designs corresponding to the proportion of the state budget is automatically assigned to the organization in charge and is not compensated.

Fifth, the State, for inventions that are the result of scientific and technological tasks in the field of national defense and security in cases where the scientific and technological tasks use the entire State budget;

Sixth, the State for inventions that result from scientific and technological tasks in the field of national defense and security in cases where the scientific and technological tasks are invested with many sources of capital, including a part of the state budget. The right to register inventions, industrial designs, and layout designs corresponds to the proportion of the state budget belonging to the State or

Seventh, the person who obtains information about the invention directly or indirectly from the subjects (1), (2), (3), (4), (5), (6) mentioned above.

The above provisions also apply to inventions disclosed in industrial property registration applications or industrial property protection certificates published by the state management agency of industrial property in cases where the publication is not by the provisions of law or the application is submitted by a person who is not entitled to register (Clause 2, Article 2 of the Law on Amendments and Supplements to several Articles of the Law on Insurance Business and the Law on Intellectual Property 2019).

The above provisions do not exclude the possibility of protection for inventions created by AI.

5.2. Procedures for filing a patent application

The procedure for registering for patent protection is mainly regulated in Decree No. 65/2023/ND-CP. In particular, the patent registration form requires information about *the inventor*. The inventor does not necessarily have to be the applicant, but the application form must show information about the author. The required information includes personal information: Name, address, phone number, nationality, and email. It can be seen that information about the inventor is mandatory in the procedure for applying for protection.

Article 122 of the 2005 Law on Intellectual Property (amended and supplemented in 2009, 2019, and 2022) stipulates the inventor as follows:

- The inventor is the person who directly creates the industrial property object; if two or more people create the object, they are co-authors of the invention.
- The author of an invention has personal rights and property rights. The personal rights of the inventor include the right to be named as the author in the Patent of Invention and the Patent of Utility

Solution, as well as to be named as the author in documents announcing and introducing the invention, industrial design, and layout design. The inventor's property rights include the right to receive remuneration according to the provisions of the Law on Intellectual Property.

6. CONCLUSION

The UK courts have adopted textualism, focusing on the words of the legislation, not on the policy purpose for which the legislation was enacted.[12] As a result, the UK courts have interpreted the ordinary meaning of a statutory term or provision. Textualism entails "*looking at the statutory construction and listening to the words as they would sound in the mind of an objectively reasonable and skilled user of the words*."[13]

The UK court took a textual approach, thus determining that AI systems such as DABUS should not be recognized as inventors under patent law. Section 13(2)(a) of the UK Patents Act requires the applicant to identify the *"person or persons"* who are claimed to be the inventor or co-inventors, and this phrase cannot be extended to non-human entities. According to the UK court, the underlying rationale for limiting the innovator to individuals is that AI systems cannot acquire ownership of an invention or transfer it.

According to the UK courts, the plain language of patent law in these countries demonstrates the human-centered foundation of patent law. Humans are the only species capable of independent reasoning. Animals are not rational, and corporations (legal entities) are merely fictitious legal entities and, therefore, cannot form inventions. Accordingly, only individuals can be recognized as creators. According to this reasoning, AI systems cannot perform the ideation process. Only individuals can perform creative activities, so the creator can only be limited to individuals.

Here, the Court focused on interpreting and applying the relevant provisions of the Patent Act to Thaler's factual claims, namely that the inventions were made independently by DABUS and that Thaler's right to file a patent application arose from his ownership of DABUS. Accordingly, the current legal position in the UK is that inventors must be individuals, not machines, and the owner of a machine does not have an independent right to patent any technical advances made by that machine. The courts do not prevent a person from claiming to be an inventor when using AI (e.g., as an "extremely sophisticated tool") to make an invention.The Court also did not address the more nuanced question of whether technical advances in machines that operate autonomously and are assisted by AI are patentable, an issue policymakers are considering.

In Vietnam, there are no disputes related to protecting inventions created by artificial intelligence. However, that does not mean that disputes on this issue will not arise in the future, especially in the rapid development of artificial intelligence. However, current regulations of Vietnamese law also show that it is tough to protect inventions created by AI because protection procedures in Vietnam also require that at least one author of the invention be "human."

As modern technology requires some degree of human involvement in the inventive process of AI systems, the current patent regime is likely to support AI-generated inventions by attributing invention rights to a person who has dominated the inventive process.[14] There is currently no need to make any changes to patent law to identify an AI system as an inventor. Any such changes to the current legal framework will likely disrupt the rationale and fundamental principles of the patent system. Only when technology advances to a point where no human involvement is required will the mechanisms for protecting the output of such technology need to be reconsidered.[15]

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