

**LAW OF VIETNAM AND SOME COUNTRIES IN THE WORLD ON THE  
PROTECTION OF INVENTIONS CREATED BY ARTIFICIAL INTELLIGENCE  
– GENERAL TRENDS AND SOME POLICY RECOMMENDATIONS****Dr. Le Thi Minh<sup>1</sup>, Dr. Vo Trung Hau<sup>2</sup>**<sup>1</sup>Thu Dau Mot University, Binh Duong Province, Vietnam

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<sup>2</sup>Binh Duong University, Orcid number: 0009-0006-3560-4359**KEYWORDS***invention, innovation,  
artificial intelligence,  
inventor, patent***ABSTRACT**

Artificial intelligence (AI) has emerged as a significant technology transforming many aspects of life in recent years. With the increasing importance of AI-based inventions, the issue of patentability for inventions created by AI has become a topic of great interest and debate. Patent law plays a vital role in promoting innovation and protecting the rights of innovators. Patents are a form of intellectual property protection for innovators to prevent others from using their inventions for a certain period. However, the rapidly evolving nature of AI technology poses challenges to patent law, especially patentability criteria and the review of AI-based patent applications. The article outlines the legal provisions on patent procedures in Vietnam, China, Japan, and India. It concludes that in these jurisdictions, it is not possible to protect an invention created by AI because the protection procedures all require the disclosure of information about the inventor as an individual. Disclosure of information about the inventor as an individual is a mandatory requirement during the patent application process. Since an AI system is not an individual, it is, therefore, not possible to apply for a patent for an invention created by AI. On that basis, the article recommends recognizing the AI system as the inventor, but recognizing the AI system as the inventor does not mean that the AI owns the invention. They credit an AI system as the inventor, intended to accommodate the evolution of technology and distinguish between an invention made by an individual and an invention made by an artificial intelligence system.

**1. Introduction**

Despite its long history and recent rapid growth, no unified definite needs exist to describe the meaning of artificial intelligence (AI). It can be briefly defined as a branch of computer science that studies the properties of intelligence by synthesizing intelligence (P. Stone et al., 2030, p.13). What is called AI is based on the implementation of mathematical methods or algorithms through computer implementations. These methods or algorithms are often capable of learning from data and processing data in a way that exhibits "intelligence" (P. Stone et al., 2030, p.13). Although advances in AI depend on the advancement and growth of hardware resources, they are at least

equally dependent on advances in software. Subfields of artificial intelligence include search and planning, reasoning and knowledge representation, robotics, natural language processing, and machine learning (M. Caughlin, 2018, p.8). The latter is the most commonly cited subfield of AI, to the point that the two terms are sometimes used interchangeably. Machine learning (ML) can be distinguished from more traditional computer science: "Rather than explicitly programming a computer to perform a specific task, an ML system uses a learning algorithm through which some internal state of the system is configured in response to input data. The internal state represents what the machine has "learned" from patterns in the input data without the algorithm having to include any explicit coding based on what the input data "means" or for the programmer to explicitly specify (or even know) what patterns the machine should look for in the data." (M. Summerfield, 2018).

The field of AI also includes what the EU Parliament calls "intelligent robots," which possess, among other things, the following characteristics (EU Commission, 2015):

- The ability to achieve autonomy through sensors and by exchanging data with their environment (interconnectivity) and analyzing this data;
- Ability to learn through experience and interaction;
- The physical support of the robot;
- The ability to adjust their behavior and actions according to the environment.

An AI system may be used so that a result may result in an invention within the meaning of the patent regime. When that invention is the subject of a patent application, this may raise some critical questions regarding the ability of the patent regime to accommodate inventions involving AI activities. In particular, where an invention results from a process involving AI activities, who should be identified as the "inventor," and should that definition include an AI system? If the answer to the latter is yes, to whom should ownership be awarded in such a case?

## **2. Patent protection for AI-generated inventions under Vietnamese law**

Article 4.12 of the 2005 Law on Intellectual Property (amended and supplemented in 2009, 2019, 2022) stipulates that "*an invention is a technical solution in the form of a product or process to solve a specific problem by applying natural laws.*" Article 58.1 of the Law on Intellectual Property stipulates that "*an invention is protected in the form of a Patent for Invention or a Patent for Utility Solution.*" (National Assembly of the Socialist Republic of Vietnam, 2005).

Article 16.3.b Circular 23/2023/TT-BKHCN (Ministry of Science and Technology of Vietnam, 2023) stipulates technical solutions as follows:

- (i) A product in the form of an object, for example, a tool, machine, device, component, or circuit, represented by a set of information identifying an artificial product characterized by technical signs (characteristics) of the structure; that product has a function (use) as a means to meet specific human needs; or a product in the form of a substance (including simple substances, compounds and mixtures of substances), for example, a material, substance, food, pharmaceutical product, represented by a set of information identifying an artificial product characterized by technical signs (characteristics) of the presence, proportion, and state of the elements, that has a function (use) as a means to meet specific human needs; or a product in the form of biological material, for example, a gene, a genetically modified plant/animal, represented by a set of information about a product containing genetic information modified under human influence, capable of self-reproduction.
- (ii) A process (technological process; diagnostic, forecasting, testing, processing method) is represented by a set of information that determines how to carry out a process or a specific job,

characterized by signs (characteristics) of the sequence, conditions, participants, measures, and means of performing operations to achieve a specific goal.

*Article 58.2 of the Law on Intellectual Property stipulates that an invention is protected in the form of a Patent if it meets the following conditions:*

- New;

An invention is considered novel if it does not fall into one of the following cases: (i) 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; (ii) It is disclosed in another patent application with an earlier filing date or priority date but is published on or after the filing date or priority date of that patent application.

An invention is considered not publicly disclosed if only a few people know about it and are obliged to keep it secret.

An invention shall not be considered to have lost its novelty if it is publicly disclosed by the person entitled to register it or by a person who has obtained information about the invention directly or indirectly from that person, provided that the patent application is filed in Vietnam within twelve months from the date of disclosure. This provision also applies to inventions disclosed in an industrial property registration application or an industrial property protection certificate 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 filed by a person who is not entitled to register it.

- Have creative skills;

An invention is considered to have an inventive step if, based on technical solutions that have been publicly disclosed in the form of use, written description, or any other form domestically or abroad before the filing date or before the priority date of the patent application in case the patent application enjoys priority, the invention is an inventive step that a person with average knowledge in the relevant technical field cannot easily create.

- Has industrial applicability.

An invention is considered industrially applicable if it is possible to manufacture, mass produce the product, or repeatedly apply the process that is the subject matter of the invention and obtain stable results.

An invention is protected as a Utility Solution Patent if it is not common knowledge and meets the conditions of novelty and industrial applicability.

In addition, *Article 59 of the Law on Intellectual Property of Vietnam stipulates that the following subjects are not protected under the name of inventions, including Inventions, scientific theories, mathematical methods; Diagrams, plans, rules, and methods for performing mental activities, training animals, performing games, doing business; computer programs; Ways of expressing information; Solutions with only aesthetic properties; Plant varieties, animal varieties; Plant and animal production processes that are mainly biological and not microbiological processes; Methods of preventing, diagnosing and treating diseases for humans and animals.*

The procedure for patent registration is mainly regulated in Decree No. 65/2023/ND-CP (Government of the Socialist Republic of Vietnam, 2023). 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. 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, 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.

Thus, in Vietnam, inventions created by AI are not prohibited from patent protection. However, the patent registration procedure requires specifying the invention's author. The author of the invention must be a specific person. An AI system cannot be a person, so in Vietnam, an invention created by AI cannot be granted a patent.

### **3. Patentability of AI-generated inventions under Chinese, Korean, and Indian law**

#### ***3.1. Patentability of AI-generated inventions under Chinese law***

According to Rule 13 of the Implementing Regulations of the Chinese Patent Law, an "inventor" is any person who makes an inventive contribution to the essential features of an invention (The State Council of the People's Republic of China, 2001). Therefore, to clarify who can be an inventor in a given situation, it is necessary to define what "essential features" and "inventive contribution" mean in the current context. The legal doctrine of Chinese courts holds that contributing to an invention through organizing activities, providing essential facilities, or any other supporting activities is not a contribution to the "essential features" of an invention. It appears that "essential features" in this context may have the same meaning as in the definition of "inventiveness" provided for in Article 22(3) of the Chinese Patent Law, where inventiveness is defined as follows: "Inventiveness means that compared with the prior art, the invention has outstanding essential features and represents a remarkable advance, and the utility model has essential features and represents an advance." Specifically, it is the features that make the invention "non-obvious" when compared with the prior art. For example, in one case, it was held that such essential features may include essential differences in the sense of technical differences between the invention in question and prior achievements, similar to the meaning in the definition of "inventiveness" provided for in Article 22, Section 3 of the Chinese Patent Law.

Since Rule 13 refers to "inventive contributions" made to "substantive features," which have been understood to mean features that distinguish the invention from the prior art and make it non-obvious, inventive contributions to such features likely, include intellectual rather than mechanical, financial or administrative contributions to the formation of such distinctive features. Such inventive contributions to essential features "suggest the original idea of the claimed invention" (AIPPI, 2015). In short, it is argued that under Chinese law, intellectual contributions to parts of an invention distinguish the invention from the prior art and thus make the invention patentable, i.e., "inventive contributions" within the meaning of Rule 13 of the Implementing Regulations of the Chinese Patent Law. In this context, the original idea's concept may guide the invention creation process, i.e., the required contribution. Therefore, it is unlikely that, at present or shortly, claimed inventions will involve a human agent making an intellectual contribution to what distinguishes the invention from prior art. While it is possible that AI systems will generate the material essential to the creation of an inventive invention, it is still possible that the human contribution and human conception of the idea underlying the invention will allow the identification of a human inventor under Chinese patent law.

### **3.2. Patentability of AI-generated inventions under Japanese law**

Japanese patent law does not define "inventorship" (Japanese Parliament, 2015). The doctrine of Japanese courts provides such a definition. For example, in a decision of the Tokyo District Court, it was ruled that "the idea under consideration which has not undergone the experiment above is merely a research subject..., and cannot become the invention under consideration" (AIPPI, 2006). This was the basis for the court's decision to reject the plaintiff's invention claim. A report by the AIPPI details the Japanese position on invention in the following way. If person A formulates a means to solve a problem, they will most likely be considered the inventor. If person A merely presents the problem, they may still be considered the inventor (or co-inventor) if the problem itself is a feature of the invention. If Person B develops a means to solve a problem, even though Person A instructs Person B, then Person B may still be considered the inventor. If Person B confirms that the problem has been solved, they are generally not considered the inventor (AIPPI, 2015). The following excerpt from a Tokyo District Court judgment may illustrate the type of activity that may or may not be sufficient to establish invention rights. In rejecting the plaintiff's claim for invention rights, the court stated that the plaintiff "did nothing but general or comprehensive administrative actions, and there are no circumstances under which the plaintiff should be considered to have given specific instructions and engaged in the said inventive act other than the said administrative action" (Tokyo District Court, 2007). It is, therefore, clear that inventive acts are required to result in the claimed invention. Even of the utmost importance, administrative activities will not suffice for that purpose. The actions must be "inventive" and assessed request-by-request (AIPPI, 2015). Putting the above into the context of AI systems, it is clear again that a situation where an invention does not have a human agent identified as the inventor is unlikely to occur shortly.

### **3.3. Patentability of AI-generated inventions under Indian law**

Section 2 and Section 6 of the Indian Patents Act 1970 specify the criteria for recognizing an inventor as an individual who can apply for a patent in the jurisdiction of India. Section 2(p) of the Patents Act, 1970 defines a patentee *as a person who is presently entered in the register as a patentee of the patent owner*. Section 2(t) defines an interested person *as "a person engaged in or promoting research in the same field to which the invention relates"* (Indian Parliament, 1970).

Section 6(1) of the Patents Act provides that any of the following persons may apply for a patent:

- Any person who claims to be the authentic and original inventor of an invention;
- Any person who is an assignee of the person claiming to be the true and first inventor in respect of such right to apply;
- The legal representative of any deceased person has the right to apply immediately before death.

Thus, Indian law also emphasizes the role of the inventor, and since AI does not fit the definition of "individual" under various laws, AI cannot act on its own, nor can it appoint an individual to apply on its behalf (Indian Parliament, 1956).

The Controller General of Patents raised objections in the Examination Report of Thaler's Indian Patent Application, stating that the patent application could not pass formal and technical examination under Sections 2 and 6 of the Patents Act, 1970 – as DABUS was not recognized as an individual. The same is supported by several legal precedents, such as VB Mohammed Ibrahim v. Alfred Schafranek, where the Court held that neither a company nor a financial partner can be the sole inventor. The Court held that only an individual who has contributed his skills and knowledge to the innovation can legitimately claim patent rights.



Another Indian case law also reinforces this view. In the case of *Som Prakash Rekhi v. Union of India & Anr*, the Supreme Court of India decided on what constitutes a "person" in the eyes of the law. The judgment concluded that an individual is a person the law considers to have "personality." *This personality* can be extended to a legal entity, where a legal entity has the right to sue or be sued. In essence, an AI cannot exercise any rights, nor can it independently perform the mandatory duties of any legal entity (R. et al., 2023).

#### **4. General comments on the patentability of AI-generated inventions in Vietnam and in relevant jurisdictions**

The inventive or ingenious concept of an invention or contribution to it is an explicit or implicit feature of the definition of patent rights in all relevant jurisdictions. While some jurisdictions require such a concept to be included in the actual language of the claims, others define "invention" more broadly to include additional material in a patent application. However, regardless of whether "invention" is defined broadly, the substance of the actual contribution to the conceptualization of the invention must be inventive or "ingenious" in nature. In particular, in all relevant jurisdictions, involvement in the idea generation stage must go beyond the provision of abstract ideas on the one hand, and the mere implementation of ideas provided by others on the other, and such involvement is exercised at an intellectual and creative level rather than a purely financial, material or administrative level.

When assessing the nature of the contribution to the ideation stage, it is essential to note that the actual creative "spark," the decisive factor that makes an invention work and distinguishes it from previous inventions, does not necessarily originate from the inventor's creative efforts. All relevant jurisdictions grant patents for inventions where such elements, among others, result from pure luck rather than traditional creative activity. The same rationale should apply to inventions involving AI activities, where the decisive factor results from AI activities rather than human genius. The legal position in all relevant jurisdictions makes it possible for human agents to be considered inventors, regardless of whether AI activities were involved in the invention process. We also find that AI systems cannot currently be considered inventors under patent rules in all relevant jurisdictions due, among other things, to the connection between invention and ownership, which sometimes requires establishing an employment relationship. Since ownership and employment are legal concepts currently meaningless in the context of AI systems, patent rights are limited to human agents. Furthermore, it should be noted that all relevant jurisdictions provide, either explicitly or implicitly, that an inventor may contribute to the conception of an invention.

The requirement that the inventor be an individual is designed to protect and recognize the rights of a human inventor. However, inventors do not necessarily own their patents. Ownership can be transferred from an individual to a legal entity through an assignment agreement or other means provided by law. For example, in many jurisdictions, ownership automatically passes to the employer if an invention is made under an employment relationship. Even if an inventor does not own a patent, the law requires that at least one inventor be named to ensure their creative work is recognized correctly. National patent laws are created this way and do not consider the future inventiveness of machines (WIPO Magazine, 2009).

On the issue of whether the owner of an AI system can still own any inventions created by the AI, the countries' laws all hold that there is no basis to assume that the owner of the AI system will be the owner of the invention created by the AI. However, the competent authority also does not prevent a person from claiming to be the inventor when using AI in creating an invention. The competent authority must also consider whether technical advances created by fully autonomous AI are patentable.

### **5. Some policy recommendations on protection for inventions created by AI**

Having established that under the current legal position, AI systems cannot be considered inventors, one may ask whether this position should be reconsidered and whether, given the enormous technological and scientific advances supporting the field of AI, it is time for AI systems to be recognized as inventors under the patent regime.

There are generally three distinct views regarding patent protection for AI inventions. The first view stems from the patent advocates' support for inventive AI systems and the belief that AI systems can replace human inventors and should be recognized as patent inventors. In the 3A EraEra of advanced, autonomous, and autonomous technology, AI systems can be invented without human reasoning ( S. et al., 2021). The independent creative act of AI leads to a natural conclusion that AI systems enjoy the rights and obligations of inventors. Ryan Abbott, a British law professor and member of the Dabus development team, suggests that AI-generated inventions should be patentable and that the AI creative system itself should be considered an inventor and have corresponding invention rights ( R. Abbott, 2016 ). Donald Chisum, a renowned patent scholar, also supports the patentability of digital tools by asserting that creative computer algorithms should be patentable (D. Chisum, 1986).

The second perspective on patent protection for AI inventions comes from opponents of AI patents, who focus on the inappropriateness of the current patent system in the AI context. One author of this article, Professor Shlomit Yanisky-Ravid, argues that "traditional patent law has become obsolete, inapplicable, and irrelevant to inventions generated by AI systems" (Y.R. Shlomit & L. Xiaoqiong, 2018, p.2215). She takes a different approach beyond patent protection by proposing an open-source system to eliminate patent rights for all AI inventions to maximize the disclosure and development of cutting-edge technology (Y.R. Shlomit & L. Xiaoqiong, 2018, p.2216). The third view is based on the status quo approach, according to which scholars assume that patent law should be left untouched primarily to avoid a burdensome legislative process. To consider minor amendments, new agency regulations, such as the patent office examination guidelines, could be issued ( R. Ana, 2018). Some propose adding an amendment to the patentability examination process, requiring AI inventions to have replicable results (K. Peter, 2008, p. 781). Additionally, some propose a multi-level model that applies different criteria for patentability depending on the AI system's autonomy level (G. Chimuka, 2019).

The practice has shown that the current patent law system is not applicable and proposes a new legal model for examining AI inventions. While advocating similar patent rights to the first approach, it is necessary also to consider the difficulties and uncertainties in applying current patent law standards to AI inventions. A revolution is needed to establish a distinct AI patent regime, separate from the current patent regime that applies to human-made inventions. Creating a new patent regime for AI inventions is essential because many elements of current patent law are not applicable in the AI context, and small or piecemeal amendments will only address some existing concerns. This model can be implemented based on the following fundamental recommendations:

First, it is impossible to credit humans as inventors of AI-generated inventions. An AI instructor can only be an inventor if he or she contributes to the general problem-solving capabilities of AI by being aware of the specific problem to which AI is being applied or its final output. The link is even more tenuous when multiple programmers are involved in the AI development process across different stages. The less clear the human contribution to the AI output, the less likely it is that humans will be credited as authors of an invention generated by AI ( WIPO Magazine, 2019). Listing AI as an inventor is not a matter of granting patents to machines.

However, it would protect traditional human inventors' moral rights and the patent system's integrity.

In addition to protecting AI-generated inventions, AIs should be listed as inventors when they are functionally inventing, as this would protect the rights of human inventors. Allowing a person to be listed as an inventor for an AI-generated invention would be fair to an AI that does not want credit. However, allowing people to take credit for work they did not do would devalue human inventors. This would put the work of someone who asked an AI to solve a problem on par with someone who invented something new.

Second, recognizing AI as an inventor does not mean recognizing AI as a patent owner. AI systems lack legal and moral rights and, therefore, cannot own property. Again, listing AI as an inventor is not a matter of granting rights to machines. However, it would protect traditional human inventors' moral rights and the patent system's integrity. As discussed earlier, the inventor of a patent is often different from the owner of that patent. The AI owner should own any patents to AI-generated inventions consistent with general principles of property rights and rules that apply to other areas of intellectual property law, such as trade secret protection.

Listing AI as an inventor is not a matter of granting patents to machines. However, it would protect traditional human inventors' moral rights and the patent system's integrity.

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