

Artificial Intelligence in the Health Sector and Intellectual Property

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Topics

Intellectual Property

Artificial intelligence ("AI") is a broad concept that encompasses machines and systems that are capable of simulating the human behavior in terms of learning and creating. Nowadays, the most developed field of AI is known as "machine learning", in which the machine, via a computer program, is taught to identify patterns in data that are analyzed by algorithms¹, then applying the knowledge previously obtained to new data to predict results. In the field of "machine learning", human participation occurs, for example, in determining the quality of chosen data or in the way of programming an algorithm. However, there are already AI applications with minimal or no human intervention that emulate the human creation, as will be discussed below.

"Machine learning" is not a tool restricted to a single technological field, since it provides commercial benefit in a variety of technical sectors, such as in the health sector, telecommunications, transportation and security.

In fact, considering the recent development of "machine learning" in the health sector, and the advantages obtained during the Covid-19 pandemic, the relevance of AI in patenting inventions from this technological field is notorious. AI is used in intelligent decision-making process and can also be applied in the fields of sequencing and functional genomics; design, discovery, and testing of new drugs; pharmacology; "big data" analysis; cancer diagnosis; among others.

An example of the benefit of using AI in the health sector is the prediction of the diagnosis of a disease based on forms fed by a user into a computer system, so that it is possible to facilitate the diagnosis of a patient's disease by an AI system, based on the symptoms presented by said patient.

In the context of the Covid-19 pandemic, for example, assessments of computer tomography (CT scans) of the lungs of patients with Covid-19 have been performed in certain hospitals and from the "inputs" fed into the databases, AI enables the recognition of the possible most critical cases of the disease, which optimizes time and allows an easier decision-making process on the best clinical procedures.

From the statistical point of view, the Technological Radar No. 21, published in 2020 by the Brazilian PTO (INPI), presents the mapping of patent applications filed in Brazil from 2002 to 2019 related to AI, in which the health sector is the second in the ranking, with a total of 19% of the patent applications filed, behind the transport sector with 25% of filings, whereas the telecommunications sector appears in third place, with 13% of the patent applications filed.

Notably, the Dutch company Philips, which manufactures and supplies healthcare products, is a highlight in the health sector and was responsible

for the filing of around 12% of the Brazilian patent applications related to AI in said sector.

Furthermore, the Intelligence Nucleus on Industrial Property ("Núcleo de Inteligência em Propriedade Industrial" - NIPI), in a partnership with the Brazilian Agency for Industrial Development ("Agência Brasileira de Desenvolvimento Industrial" - ABDI), also published a study related to the use of AI in Brazil, specifically directed to machinery and equipment. Considering the national residents, the health sector was identified as the most relevant among 15 analyzed categories. Specifically, said sector accounts for 17% of the patent applications filed between 2002 and 2019, followed by pattern recognition (16%), electrical (15%) and mechanical (13%) sectors.

Considering the many possibilities of new technologies and innovations enabled by AI in the health sector and in many others, protecting the intellectual property involved therein becomes vital. From the perspective of protecting intangible assets, such as through patent, for example, the use of AI should be analyzed and discussed in two different manners: (i) AI as a tool to assist human creations; and (ii) AI as a creator of innovations with minimal (or no) human intervention.

In cases where AI is used as a tool to assist the human being in a specific task, for example, in the selection of compounds within a variety of possibilities; in predicting drug toxicity; in the use of software to evaluate lung CT scans of patients with Covid-19 as mentioned above, among others, the authorship of the invention would still be of the human being. Yet, further challenges may also arise during the patentability analysis, including how to evaluate the inventive step² and sufficiency of disclosure³ of said invention. Regarding the parameter of obviousness, that is, the inventive step of the invention, it demands a critical thinking. After all, would it be obvious for a person skilled in the art, using the AI system in the example of electing possible new molecules for clinical tests, to achieve the invention? Should the patent system change the level of the inventive step deemed necessary to patent inventions involving AI?

Regarding the sufficiency of disclosure and its importance to stimulate the society's constant technological development, there are also relevant aspects to be considered. Does the use of AI in a patent application make it difficult to guarantee its sufficiency of disclosure? If so, will there be an impact on its patentability?

On the other hand, in cases wherein the AI is responsible for creating an invention, the main discussion falls on the authorship of said invention. An emblematic example is the AI system named "Dabus", which was developed by a human being⁴. In the Dabus case, the AI system itself developed two inventions for which the scientist who created it filed patent applications. In said applications, Dabus was indicated as the inventor, whereas the scientist (legal person) was the Applicant.

The patent offices in Australia, the United States and Europe rejected said patent applications, on the grounds that only a natural person could be named as an inventor. At the appeal stage, the US and the European Courts maintained the decision to reject the patent applications, but the Australian Court accepted the appeal and granted the patent on the grounds that an evolutionary interpretation of the patent law should be used on the analysis of inventions related to AI.

In Brazil, one of the patent applications for Dabus creations had a formal Office Action issued requesting clarifications on the fact that only Dabus was included as inventor. Although the Applicant has responded to the formal Office Action in an attempt to justify said inclusion, the Brazilian PTO did not accept the Applicant's arguments, on the basis of the impossibility of naming or indicating an AI as the inventor of a Brazilian patent application.

In fact, the Brazilian patent legislation does not explicitly address the term "legal person" for an inventor, but the most accepted interpretation is that the inventor should necessarily be a legal person. Accordingly, the Brazilian PTO published a decision to withdraw the Brazilian national phase in the Industrial Property Gazette No. 2696 of September 6, 2022. Said decision may still be appealed by the Applicant in the administrative instance or challenged before the Federal Court in a lawsuit against the Brazilian PTO.

It is known that the laws must accompany the social and economic changes of each country, as well as consider its international relations. In particular, the AI is becoming even more present in the world, for example, in daily activities, such as a self-checkout kiosk in supermarkets, or in the technological development aimed to the public health, as aforementioned.

Thus, in view of the global trend of expansion and technological progress, it is necessary to establish specific regulations on those technological advances achieved with AI to guarantee market efficiency and legal certainty before third parties. It is important to modulate a criterion for the analysis of inventions involving AI, regarding formal aspects (such as ownership and authorship of said inventions), as well as regarding more technical and subjective parameters (such as the determination of the inventive step level of an invention involving AI, or how to assess and confirm if it presents sufficiency of disclosure).

The fact is that the patent laws governing most countries did not predict that an AI system would be able to create and innovate. Therefore, the whole technological and creative production was limited to a legal person, which brings new and important reflections: should the patent and IP system stop being anthropocentric? Is the application of Economic Theory⁵ still valid in an AI-based technological development environment? Discussions to answer these and other questions are still ongoing.

Expectations are high for effective granting and implementation of protection for developments involving AI, either as a tool or as a creator. In addition, it is necessary to follow the technological and creative progress, seeking evolution of the nations, promoting partnerships between universities and companies, via transfer of technology or joint development, thus, providing benefits to the global population.

>>> This article belongs to the e-book: "Intellectual Property". Click here to read more articles.

NOTES:

¹ Algorithms are sequences of tasks to achieve an expected result in a limited

time.

² The inventive step is one of the requirements to consider an invention as patentable.

³ The sufficiency of disclosure of a patent application is also a requirement for patentability.

⁴ Stephen Thaler is the creator of the AI system "Dabus" which literally means "Device for Autonomous Bootstrapping of Unified Sentience".

⁵ The Economic Theory predicts that the financial remuneration generates incentives for research on innovations and dissemination of information by the owners/Applicants.

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