UDC 004.8:347.77
DOI https://doi.org/10.32782/hst-2023-17-94-17

IMPACT OF ARTIFICIAL INTELLIGENCE ON PATENT LAW

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Abstract

Relevance and novelty.

According to Professor Klaus Schwab, the founder and head of the World Economic Forum, new and rapidly developing technologies are interconnected and complement each other in the physical, biological and digital spheres. In 2025 it is estimated that the preliminary amount of investments in the development and improvement of these technologies, including the annual increase in their value, which usually reaches 50 %, will rise to 35–50 billion US dollars. It is important to highlight that the number of patent applications related to artificial intelligence has increased significantly in recent years. A review conducted by the World Intellectual Property Organization notes that since the emergence of artificial intelligence in the 1950s, inventors have filed nearly 340,000 patents. Patent applications and published more than 1.6 million scientific publications on the topic of AI. In order to increase Europe's competitiveness in the fields of artificial intelligence research and implementation, the European Commission in 2018 published the European Artificial Intelligence Strategy, in which the following goals were set: promotion of the implementation of artificial intelligence in all areas of the economy, increasing the technological and industrial capacity of the European Union and preparing for economic and social changes, thus guaranteeing the proper functioning of legal and ethical systems. Also, in the same year, i.e. in 2018, by the decision of the European Commission, the European Artificial Intelligence Alliance was established to bring together various discussions and attract the participation of companies, consumer organizations, trade unions and representatives of civil society. In 2020 The European Commission presented an ambitious program published in the White Paper, the essence of which was to establish a pan-European approach to artificial intelligence. Artificial intelligence and computer systems based on it have long been used in most industries to automate and modernize all production. However, today these systems are becoming widely used in commercial industries as well. According to R. Abbot, a professor of law and medical sciences at the University of Surrey in the United Kingdom, artificial intelligence has recently been able to independently create inventions that can potentially be protected by patents. Despite this, many countries require that a natural person filing a patent application be listed as the inventor, but no legal framework has yet emerged to regulate the legal protection of inventions created by artificial intelligence (Abbot, 2019). The ongoing debate has also affected the World Intellectual Property Organization (WIPO), whose goal is a balanced and effective international intellectual property protection system that encourages innovation and creativity. The organization invited all member states to participate in a political debate on the impact of artificial intelligence on intellectual property rights. The third session discussed the most important questions of patent law: will there be a result of intellectual activity when an object has all the characteristics of patent law, but is autonomously created by artificial intelligence? Who will own the intellectual property rights to the invention created? During the discussion, Estonia, Latvia and Poland expressed their positions, but Lithuania has not yet spoken on this topic. In conclusion, the significance of the topic addressed in this scientific Article stems from the continually rapid progress of artificial intelligence technologies. This progress provides the opportunity for artificial intelligence to function as an inventor, creating innovations without human intervention. Considering the ongoing technological changes, it is suggested to update patent law systems and strive to balance the interests of society and artificial intelligence developers. Problematic question: can artificial intelligence be recognized as an inventor in the context of patent law? The purpose of the article: is to examine the impact of artificial intelligence on patent law. Object: the analysis of the legal system of patents, the regulation of which is influenced by artificial intelligence. Tasks: 1) examine the concept of the invention and compare patenting conditions in selected different jurisdictions; 2) analyze the current impact of artificial intelligence on Lithuanian patent laws and identify problems; 3) indicate the future prospects of artificial intelligence for the improvement of legal acts. Methods: linguistic (linguistic) – helps to understand the true meaning of the concepts and expressions used; systemic – helps to study patent law interacting with other legal systems; comparative – used to compare Lithuanian patent sources with European and other countries patent laws and court decisions; logical – integral in presenting conclusions and generalizations of thoughts.

Key words: artificial intelligence, invention, patent law, intellectual property, impact.

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Artificial Intelligence and Industrial Property

Today, artificial intelligence has more and more points of contact with industrial property law. The term "intelligence" itself refers to a set of mental abilities that include reasoning, planning, problem-solving, abstract thinking, grasping complex ideas, rapid learning, and experiential learning (Gottfredson, 1997). Experts and developers in the field of artificial intelligence observe that the algorithms developed thus far, namely, sequences of mathematical operations executed by computer programs to attain specific outcomes, which only possess a partial degree of intelligence. The prevailing perspective posits that, as of yet, no artificially created intelligence has achieved parity with human cognitive capabilities. However, according to Professor Paul Davies of the University of Arizona, the word "artificial" should be changed to "engineered" because in fact, we are talking about engineered human intelligence (Davies, 2015). In 1956 the term "artificial intelligence" was used for the first time at the Darmut conference, and it was from this time, as Vilnius University associate professor Vytautas Čyras notes, that the concept of artificial intelligence (AI) was constantly being expanded. In 2019 in the prepared National Artificial Intelligence Strategy, artificial intelligence was defined with the help of the 2018 December 7 The definition of AI presented in the European Commission's Communication on the Harmonized Plan for Artificial Intelligence, indicating that it is systems that demonstrates intelligent and clever behavior, analyzing their environment and making relatively independent decisions to achieve the goal (Lithuanian Artificial Intelligence Strategy, 2019). However, even though Lithuania is considered one of the first countries in the European Union to prepare a National Strategy for Artificial Intelligence, it is obvious that the concept of artificial intelligence has been misinterpreted in the document adopted as a matter of urgency. Such semantic errors in the Lithuanian definition arose due to the ability attributed to artificial intelligence to demonstrate skillful behavior and make independent decisions, but such epithets are not suitable for AI activities. It should also be noted that the Communication and the definitions formed by artificial intelligence system experts do not mention the ability of AI to act intelligently. NRS 482A.020 of the United States Nevada Administrative Code (NAC), Chapter 482A, Autonomous Vehicles, defines artificial intelligence as "the use of computers and related software in such a way that a machine can replicate or imitate human behavior" (Nevada Administrative Code, 2016). However, it is important to distinguish the features of artificial intelligence mentioned in the concepts – imitation and reproduction of human cognitive functions, self-learning, finding solutions without a predetermined algorithm, and demonstrating behavior that people consider intelligent.

The question of what kind of machine can be considered intelligent was raised in 1950. The possibilities of machines to imitate human mental activity, methods, and possibilities were studied by the pioneer of informatics A. Turing, whose methods were relevant at the early stage of the development of artificial intelligence, when the intelligence of machines that passed the research test was considered sufficient. Vilnius University Institute of Data Science and Digital Technologies professor dr. Olga Kurasova explains that "through learning and improvement, real AI is created, which does not work according to pre-programmed rules, but reacts independently to changing situations. Therefore, in order for a system to be considered intelligent, it must be able to behave in an uncertain situation" (Vilnius University, Science without sermons, 2019). Thus, the ability to learn from the environment and acquired experiences distinguishes artificial intelligence technologies from other systems and allows us to draw conclusions about a certain autonomy of these technologies, and this field of science is called machine learning.

Analysis of legal and technical literature has shown that artificial intelligence is a kind of imitation of human intelligence. Artificial intelligence refers to complex computer systems that include robotics, deep learning, natural language processing, computer vision, and many other fields. Scientists have been engaged in AI system architecture and research for more than half a century, and are gradually moving from the quantity of AI system tasks to their quality. However, in the most general sense, artificial intelligence can be described as algorithms that learn independently from the data they are given and therefore constantly improve. In recent decades, there has been a breakthrough in the field of computer vision – artificial intelligence has been developed to extremely high recognition standards, it has learned to recognize human faces, and car license plates, and distinguish between civilians and soldiers, and because of this, there are more and more practical applications for artificial intelligence.

Most countries, and Lithuania itself, are not completely free in the legislative aspect of industrial

property and patent law laws. The signatory states of the Paris Convention form the Union and undertake to adopt national laws for the protection of industrial property, establishing the national regime, the right of priority, and other general rules. According to the principle of a national regime, citizens of any country of the Union have the right in all other countries of the Union to be treated in the same way as their own nationals are treated in those countries – to be able to enjoy the same protection of industrial property that those countries give to their own nationals (Ricketson, 2015). Thus, the right of priority in the context of patent law allows foreign patent holders to enter national patent systems without losing the first filing date. The World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) stipulates that patents must be granted for products and processes in all technological fields if they are new, inventive, and capable of industrial application. The agreement also specifies exclusive rights for patent owners and a twenty-year term of protection for inventions, which is calculated from the date of filing the application (Davison et al., 2020). It can be argued that TRIPS has established minimum levels of intellectual property protection in member countries, but the said treaty does not prevent states from setting higher standards of requirements, which creates differences in patent systems.

The United States Patent Act provides that "everyone who invents or discovers any new and useful process, machine, article, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor" if the invention meets the requirements of novelty and non-obviousness. Another international agreement is the international (regional) patent law system, operating on the basis of the European Patent Convention (EPC), which was ratified in Lithuania and entered into force in 2004 when Lithuania became the 30th European Patent Organization (EPO) member (Ministry of Foreign Affairs, 2018). The peculiarity of this patent system is such that the applicant can obtain the protection of the invention in 38 European countries, according to the issued European patent, if "within the specified time after the issuance of this patent, he submits to the patent offices of the specified countries the necessary translations and pays state taxes". (State Patent Office of the Republic of Lithuania, 2020). However, AI does not create inventions in the sense that the tasks assigned to it, which it is taught to perform, are known to it in advance. An AI system is therefore considered to be used as a tool, and an invention created in such circumstances is likely to enjoy the same legal protection as any other invention whose conception was created by a human using a computer program. Today, AI has already reached a new stage and is pushing towards the authorship of the invention. While accepting the position that AI can already or will soon be able to self-invent, two possible criteria that would allow us to delineate an AI developer or tool are the extent of human intervention and the internal evolution of AI itself, but analyzing them is still difficult since in many jurisdictions AI is still not credited as the inventor. Therefore, the following parts of the Article will aim to analyze the concept of invention as an object of patent law, in order to determine whether inventions are only the result of human activity, and also highlight the characteristics of artificial intelligence as a human tool and as an autonomous inventor, which allow distinguishing artificial intelligence from self-created inventions from human performance.

Problems in the use of artificial intelligence in the development and patenting of inventions

The premise of the first concept is that an invention is a "flash of genius" of the inventor. The second concept, on the contrary, calls inventions part of a certain social context and the result of a specific process of invention that is not related to genius. It is the representative of this theory, the US sociologist William Fielding Ogburn, who held the view that inventions are inseparable from the social and cultural environment in which inventors operate, and inventions themselves are the modification of known and existing material and immaterial elements of society's culture in order to create something new (cited in Ogburn, 1969 Howaldt et al., 2016). Therefore, this paradigm establishes the point of view that an invention can not only be the result of human activity, as it occurs by modifying existing social goods. In Lithuania, an invention in the narrow sense is considered a technical solution to a problem, "related both to the creation of a new device, product or process and to the improvement of an already known device or process" (State Patent Office of the Republic of Lithuania, 2018). From the point of view of intellectual property law, an invention can be considered patentable only if it meets three mandatory conditions (hereinafter referred to as patentability criteria): novelty, level of invention, and industrial applicability, which are defined in Article 4 of the Law on Patents. 1 d. (Patent Law of the Republic of Lithuania, 1994).

Thus, although the legal acts of the Republic of Lithuania do not provide a definition of an invention, Article 4 of the Patent Law establishes the criteria for a patentable invention and provides a list of objects that are not considered inventions in Lithuania. Patent law is governed by the principle of territoriality, which means that a national patent issued in one country has no effect outside the territory of that country and cannot be infringed in another country (Doi, 2002). On the other hand, this principle does not negate the significance of patent law harmonization at supranational levels, and the concluded international and regional agreements ensure the essential consistency of substantive and, to a lesser extent, procedural law norms related to patents. Therefore, when an inventor seeks broader protection and wants to protect his invention not only in the country where he created the invention, he can submit applications separately in each desired country according to its current national legislation or seek to simultaneously obtain legal protection in several countries, using the opportunity provided by international agreements (State Patent Office of the Republic of Lithuania, 2020). The Patent Cooperation Treaty, which is currently signed by 157 countries, discusses ways to protect inventions worldwide. This treaty does not set criteria for a patentable invention, as these applications consist of international and national levels, nor does it provide a list of objects that are not considered inventions (Patent Cooperation Treaty, 1970). The international level itself includes an international search and a written opinion on the patentability of the invention and, at the request of the applicant, may include a preliminary examination. Later, it is accessible at the national level, during which the examination of the invention in the countries chosen by the applicant ends, and national patents are issued, valid according to the national patent laws of the countries that issued them (State Patent Office of Lithuania, 2020). Due to this harmonization between international and national levels, patentability criteria and lists of patentable inventions are regulated not by the PTC, but by national laws, which may set different amounts of patentability criteria, treat the content of these criteria differently, and establish exceptions to patentable inventions.

Over the years, more and more doubts have arisen as to whether the contribution of a natural person to the invention process can be considered sufficient to entitle him to the status of the inventor. Laws must ensure legal certainty, so it is necessary to look objectively at the emerging situation in patent law and be ready to react to technological breakthroughs. Artificial intelligence autonomous inventions raise important questions regarding the legal implications of patent protection, specifically whether intellectual activity is rewarded to the right person, to the right extent, and under the right conditions. In 2019–2021, the courts and patent offices of the various jurisdictions listed below noted that artificial intelligence cannot be the inventor of a patentable invention, and such decisions were influenced by the artificial intelligence machine created by S. Thaler – "DABUS" (Device for the Autonomous Bootstrapping of Unified Sentience), which is trained to mimic the activity of the human brain. Thaler has filed several patent applications for a fractal food container and a distinctive attention-grabbing alarm. In the applications, he claimed that the inventions were created by DABUS, as he himself has no experience in the field of designing food containers and flashlights that would allow him to dispose of the non-material inventor's rights related to the subjects of the said patent applications. In these applications, S. Thaler was listed as the patent owner, but DABUS was listed as the inventor. Applications for DABUS inventions have been submitted to the United Kingdom Intellectual Property Office (UKIPO), the European Patent Office (EPT or English EPO), the United States Patent and Trademark Office (USPTO), the World Intellectual Property Organization (PINO or English WIPO), South African Patent Office (SAPO), Australian Patent Office (APO), as well as patent offices of Germany, China, India, Brazil and other countries. The applicant argued that DABUS is an independent inventor and the inventions belong to the applicant who, as the owner of the artificial intelligence, has the right to file the application. Refusal to issue a patent would be equivalent to denying the patentability of an invention as an object of patent law. From the decisions of the patent offices and courts of various jurisdictions, it can be seen that the Republic of South Africa has become the first jurisdiction to recognize artificial intelligence as an inventor, as based on the decisions of other countries, the possibilities of autonomous creation of artificial intelligence have been denied. However, from a legal point of view, the DABUS case revealed legal protection issues for inventions created autonomously by artificial intelligence systems (such as object without subject, transfer of ownership of invention, and determination of patentability) that do not yet have universal solutions.

Another problem is associated with the "artificial inventor" becoming a legal entity. Persons participating in legal relations, exercising general and subjective rights, are considered legal subjects, which shows in which civil legal relations he participates, as well as in what plane of legal subjectivity he expresses himself as a social personality. Exclusive rights to an invention are acquired upon receipt of a patent issued to the inventor, his successor, or employer, in cases of official invention (Article 10 of the Patent Law of the Republic of Lithuania). The problem that the DABUS case revealed is that in most jurisdictions AI cannot acquire exclusive rights to an invention because it is not considered subject to patent law. Also, court practice and patent office guidelines interpret the concept of "inventors" as natural persons. Once AI reaches Artificial General Intelligence (AGI), it is assumed that it will unquestionably become an independent inventor. The following solution methods are proposed: to give artificial intelligence the subjectivity of law by way of legal fiction; identify the person responsible for the inventions; and remove the requirement to indicate the inventor. In the past practice, the only criterion for granting patents was the standard of the object of the invention, and the personality of the inventor was ignored (Feng and Pan, 2021). In determining whether an invention is patentable, courts generally consider the outcome of the invention process and the quality of the results, rather than the mental processes of the subject that created the invention" (Dornis, 2020). In this regard, it means that an incapacitated or minor person can be an inventor as long as he created the invention. The current US Patent Act contains a prohibition against discrimination against inventors, which provides that patentability cannot be denied by the way the invention was made, and the United Kingdom argues that such a requirement is not codified in the 1977 Act. In the Patents Act, however, invention results discovered through "trial and error" were still patentable (Fraser, 2016). Thus, with the long-term invention no longer requiring the idea to originate in the inventor's mind and patentable results of purposeful scientific experimentation or serendipitous luck, it can be argued that AI inventions should not be "discriminated" in this regard. It is believed that the legislator did not at all consider the fact that soon inventions will be generated independently by artificial intelligence, and not only by humans, because until now inventors cannot be legal entities – companies, organizations, etc. That is why the concept of inventor in Lithuania is formulated in the law through the requirement of a natural person (LR Patent Law, 1994), the status of artificial intelligence was not considered. To this day, various scientists of the world criticize the concept of an inventor, when only a person is considered to be the inventor. It is wrong to consider individuals who did not actually create the invention as the original entity (Feldman and Thieme, 2018). Artificial intelligence must be recognized as an entity because to consider a human being the inventor in such cases is a fraud (Schuster, 2018). According to the existing legal regulation, the natural person who first "recognized" or "discovered" the invention of artificial intelligence is considered an inventor, which fundamentally does not meet the goals of patent law (Dornis, 2020). In summary, in most jurisdictions, artificial intelligence cannot currently acquire exclusive rights to an invention due to its lack of patentability. In Lithuania, as in other foreign countries, only a natural person can be an inventor, and this is established ad verbum by Article 7, Part 8 of the Law on Patents of the Republic of Lithuania. Elsewhere, this requirement is not established directly, but clarified in case law. However, the researchers propose to solve the subject-related problem by recognizing artificial intelligence as a subject of patent law by way of legal fiction, as well as creating new legal subjects in the law and giving them the corresponding rights that would give artificial intelligence the status of an inventor as a subject.

When explaining whether an invention created by artificial intelligence is patentable, there are also many doubts. Most researchers point out that existing patentability criteria are not suitable for evaluating inventions created autonomously by artificial intelligence, as the main problems arise from the level of invention or the non-obviousness requirement. Although an invention may not be obvious to a skilled person, the same invention may become obvious when viewed by a person who can use a similar artificial intelligence system to create the invention (Fraser, 2016). When assessing whether an invention meets the criterion of inventive step or non-obviousness, the level of skill of a specialist in the relevant field must be assessed. This skill level can be greatly enhanced by artificial intelligence systems that can instantly process the vast amount of data available to them. Namely, patentability is determined based on the ability of a specialist in the relevant field to know and the ability to invent, so any change and expansion of skills will inevitably change the limit of patentability and accordingly change the assumptions of the invention (Dornis,

2020). The question is whether human inventions should be judged by what AI machines can achieve, and conversely, whether possible AI machine invention actions should be judged by the capabilities of humans, other AI machines, or both. In this regard, it can be assumed that both human and artificial intelligence inventions are subject to the same criteria, since "there are no special provisions for patents arising from computer creations, so they must be evaluated according to the general patentability requirements like any other inventions". (Davies, 2011). In Lithuania, according to Article 7 of the Patent Law of the Republic of Lithuania. 1 d. is determined by the technical level, and Art. 16 2 d. – the requirement to disclose the essence of the invention, establishing that "the description of the invention must disclose the invention clearly and in detail so that a specialist in the relevant field can use it" (LR Patent Law, 1994). However, the disclosure requirement can be difficult to enforce due to the "black box" nature of many forms of AI systems, as it makes it impossible to know exactly why the AI algorithm reached a particular conclusion in a particular case. Therefore, it is suggested to solve the problems of the object of artificial intelligence inventions by dividing the inventions into those created by the "inventor of a natural person" and the "inventor of artificial intelligence", because such a division would establish different regulations of patent law (Feng and Panb, 2021). In conclusion, AI could create inventions that contribute to significant societal progress, but it is not excluded that many low-quality patents will be issued, as the determination of the non-obviousness of AI-generated inventions may be imprecise. Therefore, in the field of intellectual property law, it is proposed to revise the test of a specialist in the relevant field, to create a new or mixed standard for the level of invention, depending on whether the inventor is a person or an artificial intelligence.

It is also important to discuss the status of the patentee and his exclusive rights when analyzing doubts arising from the distribution of intellectual property rights. The inventor or other subject of patent law, having patented the invention, acquires the legal protection granted to the invention by a patent, which guarantees the exclusive rights of the patent owner to the invention for a certain period of time, thus, the right to allow or prohibit others from using an invention: to manufacture, use, offer for sale, sell, import or export that product (State Patent Office, 2020). In the DABUS cases, with legal disputes in all jurisdictions, S. Thaler argued that the artificial intelligence is the inventor, therefore the personal non-property rights to the inventions belong to him and that he himself is the owner of DABUS, therefore the property rights automatically pass to him (Thaler v Comptroller General of Patents, 2021). It is not necessary for an inventor to ever own the invention, and it is not necessary for ownership to arise by way of transfer. Therefore, the court ruled that the exclusive rights to the invention must belong to the owner of the artificial intelligence, who in the case of DABUS was also the original programmer. Users of artificial intelligence systems acquire exclusive rights to inventions if their use is de jure based on property rights (Dornis, 2020). According to the UK 1977 Under the Patent Act, the inventor is the first owner of the patent, unless another entity has a "superior" right, such as under an employment contract. The computer owner should be recognized by law as the first owner of patents, as this would create the best conditions for various possible business models based on autonomous invention technologies. In addition, corporations would have the legal power to bring patent infringement lawsuits (Fraser, 2016). According to VU prof. Dr. According to R. Birštonas, all rights to artificial intelligence inventions should be concentrated in the hands of AI owners, and basically, this would mean an intervention in the rights of existing or future AI users. "Rights holders are reluctant to share exclusive rights with users, who usually receive only limited access wrapped in a set of standard conditions" (Birštonas, 2019). Thus, assigning exclusive rights to AI inventions to AI owners would also mean the concentration of most patents in their hands. In summary, the question of who should own exclusive rights to an AI invention still has no answer, as researchers point to the original programmers, owners, users, or even investors in AI systems as suitable candidates for a patent. It is believed that exclusive rights should be granted to the AI itself, recognizing the computer as a subject, and then they are transferred on the basis of contracts, but it is not ruled out that transactions require a lot of time and money, so the legislator must determine in advance who these rights will belong to. According to scientist C. R. Davies, it would be enough to grant legality to AI and to later implement the capacity in the form of an institute of representation under the law.

Legal protection of artificial intelligence inventions and its problems

The exclusion of inventions created autonomously by artificial intelligence in the legal regulation of patents creates a peculiar uncertainty. Scientists

in many jurisdictions have stepped up their opinions and positions on the issue of artificial intelligence and patent law, following the DABUS patent and Federal Court of Australia ruling. A significant number argued that AI inventions should be considered intellectual property objects with one or another limitation. It is important to reveal how patent law could and should regulate the results of the autonomous creation of artificial intelligence. Given the potentially significant societal benefits that innovation can bring, the patent system must be adjusted to continue to adequately protect intellectual investment and encourage the development of computer-based invention systems, and patents should be issued to AI owners. It is suggested that shortening the term of a patent protecting an AI invention, thereby rebalancing the balance of work and reward, or increasing patentability by requiring a greater degree of industrial applicability, could reduce the number of patents with little practical utility, thus preserving patent protection for inventions that truly benefit society (Fraser, 2016).

Scientist T. W. Dornis says that now it is possible to protect intellectual property inventions only by using the protection of trade secrets. AI inventions must be considered worthy of protection, but legal regulation does not require full patent protection for them. The researcher makes a proposal that includes a lower level of protection and the creation of an alternative sui generis right, which could then become a balanced incentive. Such a decision would be appropriate, because individuals, beneficiaries of IP exclusive rights to inventions, would most likely choose patent protection with restrictions, rather than protecting inventions as a commercial secret, and in this way the principle of information dissemination would be ensured. The prevailing view is to consider machine-made inventions unpatentable. This approach to works created by artificial intelligence is followed in copyright law. From the material of the Copyright Office, it is clear that copyright registration is not possible for non-human works. Artificial intelligence is also expected to have a greater impact on patent law than on copyright, as many prose authors create works with little or no expectation of financial return. Patent law is therefore likely to face much greater "pressure" from businesses operating AI for regulatory change, as it involves a significant investment, unlike copyright.

The problem of the "artificial inventor" could be solved by issuing patents for machine-made inventions with human inventors. To this day, patents are issued for computer-generated inventions. However, not all scientists agree with this proposal and argue that people should not receive patents for inventions they did not contribute to (Feldman and Thieme, 2018). Also, it would obscure the authorship of the AI, thus preventing a proper patentability assessment. AI can detect patterns in vast amounts of data and make predictions that the human brain might miss, making it difficult for a skilled practitioner or patent examiner to explain the inner workings of AI. Artificial intelligence inventions are characterized by a lack of transparency and difficulty in replicating, so it is proposed to tighten the disclosure requirement, as the traditional approach in patent law has focused on the human role in the invention process to provide a definition of invention based on human-made results. Thus, patent applicants should be required to disclose the role of artificial intelligence, if any, in the development of the invention in order to make a proper patentability assessment.

Another position proposed by the scientists is patenting, indicating a person as the inventor, but revealing the contribution of AI to the invention, but this solution would not be correct, because those persons who did not de facto create the invention themselves would be recognized as inventors. It is also proposed to expand patent law in the sense of subjects, enabling the application of existing patent protection to AI inventions. C. R. Davies points out that "giving a machine personhood and allowing it to have intellectual property rights will enable us to transfer such rights to a party who is contractually entitled to them" (Davies, 2011). Recognition of the true inventor in a patent is essential to preserve the essence of and faith in the patent system. It has been proposed that inventions created by artificial intelligence be given patent protection based on human collaboration, which can be implemented by granting the AI co-inventor status. Managing patent rights and responsibilities requires a human element because it cannot be done by a computer alone. However, this would not resolve the issue of authorship of autonomous AI inventions as to who should be considered the author of the invention. Nevertheless, it is argued that the regulation of the current patent system is adequate to address emerging technological challenges. Patent law challenges are capable of being met by the courts, and despite the unprecedented pace of recent technological progress, most emerging issues can still be resolved based on the old principles of patent law. Currently, legal protection of inventions created autonomously by artificial

intelligence is not possible in Lithuania, based on the notion of inventor regulated in Article 2, Part 8 of the Law on Patents of the Republic of Lithuania 63. Thus, without amendments to the aforementioned Article and the norms of other legal acts discussed in the previous subsections, patent protection cannot be applied to AI inventions in Lithuania. Before changing the legislation, it would be important to conduct several studies and assess the possible risks and benefits of their changes.

Conclusions and discussion

Artificial intelligence is a set of algorithms that can learn from their own experience, imitate and replicate human cognitive functions, independently search for solutions (without a predetermined end result), and exhibit behavior that humans consider intelligent. The independent ability of AI to find solutions to technical problems allows us to talk not only about inventions created with the help of AI systems but also about the autonomous operation of artificial intelligence systems and the possibility that they are already creating or will soon create inventions that can be protected as objects of intellectual property rights. In patent law, an invention is a solution to a technical problem that meets the criteria for patentability established by legislation, regardless of the method of its creation, so inventions can be considered not only the results of human activity but also objects created autonomously by artificial intelligence. When comparing the USA, UK, Australia, PAR, Lithuania, and other jurisdictions, the territorial differences in the patent law system between them become apparent. Patent laws in some countries do not grant legal protection to artificial intelligence inventions, but in the Republic of South Africa the results of artificial intelligence can be patented and the artificial intelligence itself can be considered an inventor. The analysis of the national legal regulation indicates that if an application is submitted in Lithuania stating that DI is the inventor, it would not meet the requirements for the content of the application and would be considered not filed.

The problem of inventions of artificial intelligence: these objects of intellectual property do not have a subject, since legal acts directly or indirectly establish that the inventor can only be a natural person; the content of the invention level or obscurity criterion and the test of a specialist in the relevant field may not be suitable for evaluating autonomously created artificial intelligence inventions; it is not known on what legal basis and to which entity the exclusive rights to an AI invention should belong. Possible methods of legal protection of AI inventions: protection of sui generis rights, application of protection to unpatented inventions; non-patenting solutions (alternative methods of remuneration and protection, public domain); the inventor is only human (revealing the contribution of AI); application of full protection (DI inventor or co-inventor). By way of legal fiction, artificial intelligence could be considered an inventor and given the right to be named as such. Also, based on the representation institute, exclusive rights should be assigned in full to a natural or legal person, namely to the representatives of AI. According to the author of this paper, a person learns from what he has read or seen, similar to an algorithm. Therefore, AI, and at the same time the new creativity that AI enables, should not be restricted and a balance should be sought between promoting the development of AI technologies and protecting the interests of creators and authors and providing them with adequate remuneration.

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ВПЛИВ ШТУЧНОГО ІНТЕЛЕКТУ НА ПАТЕНТНЕ ПРАВО

Анотація

За словами професора Клауса Шваба, засновника та керівника Всесвітнього економічного форуму, нові технології, що швидко розвиваються, взаємопов'язані та доповнюють одна одну у фізичній, біологічній та цифровій сферах. У 2025 році, за оцінками, попередній обсяг інвестицій у розвиток і вдосконалення цих технологій, включаючи щорічний приріст їх вартості, який зазвичай досягає 50 %, зросте до 35–50 мільярдів доларів США. Важливо підкреслити, що за останні роки кількість патентних заявок, пов'язаних зі штучним інтелектом, значно зросла. Огляд, проведений Всесвітньою організацією інтелектуальної власності, зазначає, що з моменту появи штучного інтелекту в 1950-х роках винахідники подали майже 340 000 патентів. Патентні заявки та опубліковані понад 1,6 мільйона наукових публікацій на тему ШІ. З метою підвищення конкурентоспроможності Європи у сфері досліджень та впровадження штучного інтелекту Європейська Комісія у 2018 році опублікувала Європейську стратегію штучного інтелекту, в якій були визначені наступні цілі: сприяння впровадженню штучного інтелекту в усіх сферах економіки, підвищення технологічної та промислової спроможності Європейського Союзу та підготовка до економічних і соціальних змін, таким чином гарантуючи належне функціонування правових та етичних систем. Також у тому ж році, тобто у 2018 році, за рішенням Європейської комісії було створено Європейський альянс зі штучного інтелекту для об'єднання різноманітних дискусій та залучення до участі компаній, організацій споживачів, профспілок та представників громадянського суспільства. У 2020 році Єврокомісія представила амбітну програму, опубліковану в Білій книзі, суть якої полягала у створенні загальноєвропейського підходу до штучного інтелекту. Штучний інтелект і комп'ютерні системи на його основі давно використовуються в більшості галузей промисловості для автоматизації та модернізації всього виробництва. Однак сьогодні ці системи набувають широкого застосування і в комерційних галузях. За словами Р. Еббота, професора права та медичних наук Університету Суррея у Великій Британії, нещодавно штучний інтелект зміг самостійно створювати винаходи, які потенційно можуть бути захищені патентами. Незважаючи на це, багато країн вимагають, щоб фізична особа, яка подає заявку на патент, була вказана як винахідник, але досі не з'явилося законодавчої бази для регулювання правової охорони винаходів, створених за допомогою штучного інтелекту (Abbot, 2019). Поточні дебати також вплинули на Всесвітню організацію інтелектуальної власності (ВОІВ), метою якої є збалансована та ефективна міжнародна система захисту інтелектуальної власності, яка заохочує інновації та творчість. Організація запросила всі країни-члени взяти участь у політичних дебатах щодо впливу штучного інтелекту на права інтелектуальної власності. Третя сесія обговорювала найважливіші питання патентного права: чи буде результат інтелектуальної діяльності, коли об'єкт має всі характеристики патентного права, але автономно створений штучним інтелектом? Хто буде володіти правами інтелектуальної власності на створений винахід? Під час дискусії свої позиції висловили Естонія, Латвія та Польща, а ось Литва на цю тему поки не висловлювалася. Підсумовуючи, важливість теми, розглянутої в цій науковій статті, випливає з постійно стрімкого прогресу технологій штучного інтелекту. Цей прогрес дає можливість штучному інтелекту функціонувати як винахідник, створюючи інновації без втручання людини. Враховуючи триваючі технологічні зміни, пропонується оновити системи патентного права та прагнути збалансувати інтереси суспільства та розробників штучного інтелекту. Проблемне питання: чи можна визнати штучний інтелект винахідником у контексті патентного права? Мета статті: дослідити вплив штучного інтелекту на патентне право. Об'єкт: аналіз правової системи патентів, на регулювання якої впливає штучний інтелект. Завдання:1. Вивчити концепцію винаходу та порівняти умови патентування у вибраних різних юрисдикціях; 2. Проаналізувати поточний вплив штучного інтелекту на патентне законодавство Литви та визначити проблеми; 3.вказати подальші перспективи застосування штучного інтелекту для вдосконалення нормативно-правових актів. Методи: лінгвістичний (лінгвістичний) – допомагає зрозуміти справжній зміст вживаних понять і виразів; системність – допомагає вивчати патентне право у взаємодії з іншими правовими системами; порівняльний – використовується для порівняння патентних джерел Литви з патентним законодавством і судовими рішеннями Європи та інших країн; логічний – цілісний у викладенні висновків та узагальненнях думок.

Ключові слова: штучний інтелект, винахідництво, патентне право, інтелектуальна власність, вплив.

Received date 01.09.2023
Accepted date 15.09.2023
Published date 01.10.2023

How to cite: Silva, Antonio, Dalia, Perkumienė, Simona, Vrubleviciūtė. Impact of artificial intelligence on patent law. Humanities studies: Collection of Scientific Papers / Ed. V. Voronkova. Zaporizhzhia : Publishing house "Helvetica", 2023. 17 (94). P. 163–172.
doi: https://doi.org/10.32782/hst-2023-17-94-17