THE ROLE OF INTELLECTUAL PROPERTY RIGHTS IN THE TECHNOLOGICAL AGE

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Abstract

The last two decades have seen a huge technological development, also known as the technology explosion, making it easier for anyone to access any kind of information, including of course intellectual property, anywhere in the world, and this has created new challenges for the protection of intellectual property. But nowadays, technology not only allows access to any work of authorship or invention, it is also capable of creating works of authorship or inventions itself, leading legal scholars to debate whether works created by technology can be protected if they are not human-made. As is well known, almost all national laws only recognise an author or inventor if it is a human-made work, but what about a painting or invention created by artificial intelligence? Are such works becoming vulnerable and freely available to everyone today? The methodological basis of this article is based on general scientific approaches (analysis and synthesis, deduction and induction, comparison, analogy and a systemic and structural-functional approach). The article also draws on court decisions, legislation, legal literature, publications and doctrine. Conclusions are drawn using the method of scientific induction and deduction. The aim of this article is to explain the importance of intellectual property protection in today's technological age, where intellectual property can be created not only by people but also by technology.

Keywords: intellectual property, copyright, inventions, artificial intelligence, innovation

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Introduction

Intellectual property is one of the leading drivers of innovation and the more valuable the innovation, the more likely it is that someone will want to acquire it. The value of intellectual property depends mainly on the strategy for commercialising it into commercially viable value. In general, innovation can be seen as a new way of thinking about how business should be developed and how new ideas and technologies can be successfully commercialised. Innovation can be protected by intellectual property rights and plays an important role in enhancing the competitiveness of technology-based businesses, whether such businesses commercialise new or improved products or provide services based on new or improved technology.

Recent researches show that intellectual property rights intensive industries such as patents, trademarks, industrial designs and copyrights generate 45% of the gross domestic product and 63 million jobs per year in the European Union (EU) – 29% of all jobs (European Union Intellectual Property Office, 2020). In addition, companies using intellectual property rights are growing faster and more resilient to economic crises (European Patent Office, European Union Intellectual Property Office, 2019).

Technological developments have made access to various works of authorship or inventions much easier and faster, but rapid technological developments have also created many legal challenges to the existing intellectual property rights system and doctrine.

As early as 1925, US Supreme Court judge Benjamin Cardozo noted that "new generations bring with them new problems, which require new rules, to be exemplary according to the rules of the past, but at the same time to adapt themselves to the needs and the justice of another day and hour" (Conklin, 2020). Even today, influenced by technological developments, legal scholarship is seeking new solutions to find a balance between the traditional and stable system and the new legal challenges.

As is well known, the intellectual property system is designed to stimulate human innovation and creations, but nowadays new technologies such as artificial intelligence are increasingly entering the development of various

processes, making it more and more difficult to distinguish between human and technological processes. Thus, raising questions in legal doctrine on how to resolve the clashes caused by new technologies with the existing system of intellectual property law, balancing legal protection for both human and technological creations.

This article will explore the role of intellectual property in the new technological age, and the challenges that the technological age has brought to the growth of the field. The research methodology is based on general scientific approaches – analysis and synthesis, subtraction and induction, comparison, analogies and a systemic and structural functional approach.

1. The definition of intellectual property

According to the Convention establishing the World Intellectual Property Organisation, intellectual property includes rights in literary, artistic and scientific works, performances, phonograms and broadcasts, inventions in all fields of human activity, scientific discoveries, designs, trademarks, service marks, trade names and indications, protection against unfair competition and all other rights arising from intellectual activities in the fields of industry, science, literature and the arts (World Intellectual Property Organization (WIPO), 1967).

The United Nations (UN), when it adopted the Universal Declaration of Human Rights in 1948, set out the rights that were considered essential for human beings, and copyright was included in this document. Article 27(2) of the Declaration states: "Everyone has the right to the protection of the moral and material interests resulting from scientific, literary or artistic works of which he is the author" (The United Nations, 1948).

Although there is no uniform definition of the term "intellectual property" in national laws and regulations, it may be considered that intellectual property is the right to certain products of the human mind which have intangible value. Intellectual property does not protect ideas as such in their absolute sense, but specific expressions of ideas (copyright) or the practical use of ideas (knowledge, information) in useful products. Intellectual property rights are divided into two groups: industrial property rights and copyright.

Such rights include the prohibition to use someone's intellectual property without their prior permission. According to an accepted definition, the object of industrial property is the protection and promotion of inventions, innovations and industrial or commercial creativity. The various intellectual property rights include trade secrets, patents, trademarks, geographical indications, designs, copyrights and related rights, as well as new plant varieties (Vindele, 2021).

Since the 18th century, a national system of intellectual property rights has begun to emerge in almost every country in the world, creating property-like rights over man-made knowledge. Since the 19th century, intellectual property rights have also been enshrined in numerous international treaties to ensure harmonised and similar legal protection in different countries. The intellectual property system plays an important role in helping a company to gain and maintain an innovation-based advantage (Vindele, 2021). However, as Professor Janis Rozenfelds points out, there have also been legal systems that have not recognised intellectual property rights, such as the Soviet legal system (Rozenfelds, 2010).

The 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was a key event that fundamentally changed the international framework for intellectual property law. It requires all Parties to the Agreement to establish a set of minimum substantive standards for the protection of intellectual property that go beyond what most developing countries would have been willing to provide at the time, and even beyond the standards of many developed countries (World Trade Organization, 1994).

Intellectual property has unrestricted, global mobility, allowing it to be easily moved and conveniently transported anywhere in the world. However, its protection is also territorial. The role of international treaties and conventions is therefore essential to ensure that authors' interests are protected in many countries at the same time. On the basis of these international instruments, a copyright created in one country under its laws must operate and be protected in another country under its laws (Grudulis, 2006).

In fact, it can be argued that the purpose of intellectual property rights is to encourage the creation of new works, whether works of art or inventions, including the same technologies. The purpose of the right is, in turn, to increase the incentive for the individual to continue to create new inventions or works, while helping the development and improvement of both the creator and the users of those works.

It is considered that intellectual property protection strategies will continuously evolve over time as technology develops, issues such as adapting to this changing environment with flexible rules on copyright, patents, trade mark and design protection or even trade secrets will need to be taken into account, and how the broadest and strongest means of protecting intellectual property will be provided, both to promote legal certainty and to encourage new investment in private companies, universities, businesses through public-private cooperation to support research and development (European Parliament, 2020).

2. Definitions of authorship and patentability in law

According Copyright Law of the Republic of Latvia, an author can only be a natural person whose creative activity has resulted in the creation of a particular work, while a work is the result of the creative activity of an author in the field of literature, science or art, regardless of its form, expression and value (Copyright Law, Article No. 1). Copyright applies to literary, scientific, artistic and other works, including works in progress, irrespective of the task and value of the work, the form or manner of expression. As regards protected works, Article 4 of the Copyright Law of the Republic of Latvia contains a list of works, such as literary works (books, pamphlets, speeches, computer programs, lectures, appeals, reports, sermons and other similar types of works), dramatic and musical-dramatic works, screenplays, literary projects for audio-visual works, musical works with or without text, audio-visual works, drawings, paintings, sculptures and graphic works and other works by an author (Copyright Law, the Republic of Latvia, 2000).

For example, the Law on Copyright and Related Rights (LCRR) of the Lithuania Republic provides that the owner of copyright is the author, another natural or legal person holding the exclusive economic rights of the author in the cases provided for in this Law, as well as a natural or legal

person to whom the exclusive economic rights of the author have been transferred (Law on Copyright and Related Rights, the Republic of Lithuania, 1999). In contrast, Copyright and Related Rights Act of Slovenia states that the author is the natural person who created the work. According to the Slovenian Copyright and Related Act, copyright works are individual intellectual works in the fields of literature, science, and art, expressed in any mode, unless otherwise provided for in this Act (Copyright and Related Rights Act of Slovenia, 2016).

Thus, in general, it can be concluded that the copyright regulations explicitly provide for the natural person as a mandatory condition for the protection of a work.

On the other hand, although patent legislation, unlike copyright legislation, does not so explicitly state that the inventor may be a natural person, Article 12 of the Patent Law of Republic of Latvia provides that the inventor or his successor in title is entitled to a patent. This means that the inventor can only be a natural person (Patent Law, the Republic of Latvia, 2007). For example, the Estonian Patent Act states that the right to apply for and to become the owner of a patent is the right of the inventor and the successor in title of the inventor (Patent Act, the Republic of Estonia, 2015). In contrast to the Latvian legislation, Patent Law of Georgia explicitly states that the inventor is a natural person who has made an invention by his intellectual and creative work. According to Article 18 Patent Law of Georgian, the inventor's authorship is a permanently protected inalienable right (Patent Law of Georgia, 2010).

Although the US Copyright Act does not make specific claims for human authorship (U.S. Copyright Act, 1976), it is the current policy of the US Copyright Office to reject claims for works not authored by a human author, a position that has also been taken in US case law, on the assumption that authorship is a human phenomenon. For example, in the famous monkey selfie copyright case in the United States, the court held that an animal cannot own authorship. The US Copyright Office stated that “only works created by humans can be protected under United States law, which excludes photographs and works of art created by animals or machines without human intervention” and that “the Office will not register works produced by nature, animals or plants. Similarly, the Bureau cannot register a work purportedly created by divine or supernatural beings” (Compendium of U.S. Copyright Office Practices, Copyrightable Authorship, 2021).

In summary, it can be concluded that most national legislation focuses specifically on the rights of the natural person and that, when it comes to the involvement of technology in the creation of intellectual property, artificial intelligence or computer programs are not comparable to the natural person and, accordingly, are not considered as authors or inventors for the purposes of most legislation and do not have a right to authorship or to be recognised as an author.

However, as technology becomes more influential in the creation of various works of authorship, the interpretation of the law is also changing, for example, in 2021, for the first time in India, the Copyright Office recognised an artificial intelligence tool – the RAGHAV Artificial Intelligence Painting App – as a co-author of a copyrighted work of art (Sarkar, 2021). In the same year, South Africa became the first country to issue a patent naming an artificial intelligence tool – DABUS – as the inventor (Conlon, 2021). Thus, making us realise that humans are no longer the only source of creativity, as technologies such as AI can also create artistic and innovative works without human intervention.

Although the legal framework in most countries restricts the right to recognise technologies as authors or inventors, recent precedents mark an era of change in recognising AI as a co-author or inventor, so that increasingly the legal doctrine will have to address this issue, as it is the protection of works created by AI, recognising and protecting the interests of those who develop these technologies, that will be increasingly relevant (European Parliament, 2020). The development of AI and related technologies raises questions about the protection of innovation itself and the understanding of intellectual property rights in relation to the materials, content and data created by AI and related technologies, which may be of an industrial or artistic nature and create a variety of commercial opportunities. In this context, it is important to distinguish between human creativity supported by AI and creative works produced by AI.

Similarly, the European Union, faced with rapid technological developments and a global policy context in which more and more countries are investing heavily in AI, has presented both a proposal for a legal framework for AI and a revised coherent plan for AI to the European Commission (Gesine von Essen, 2021).

The European Union's objective to become a world leader in AI technologies, to protect the EU's digital and industrial sovereignty, to ensure its competitiveness and to foster and protect innovation, requires a structural

reform of EU industrial policy to enable it to lead the way in AI technologies while respecting cultural diversity. The EU's global leadership in AI requires an effective intellectual property system fit for the digital age, enabling innovators to bring new products to market. Strong safeguards are essential to protect the EU patent system against abuses that harm innovative AI developers. An anthropocentric approach to AI is needed to ensure that technology remains a tool for human benefit and the common interest (European Parliament, 2020).

3. The definition of artificial intelligence

The development of artificial intelligence systems dates back to the 20th century. Intelligent systems were first developed in the 1950s and 1960s, but did not become widespread at that time. This was due to the low performance of computers at the time and the very low penetration of electronically accessible data. It was therefore more practical to use programmable systems. This changed at the end of the first decade of the 21st century, when electronic data became abundant and high-performance computers became widely available (The Ministry of Environmental Protection and Regional Development Republic of Latvia, 2020). Artificial intelligence itself has evolved to the point where it can perform certain tasks without human intervention. To date, inventors and researchers have published more than 1.6 million AI-related scientific publications and filed patent applications for almost 340,000 AI-related inventions (World Intellectual Property Organization (WIPO) (2019).

Artificial intelligence is rapidly becoming part of our everyday lives. The main areas where AI technologies are used are telecommunications (Internet, radio and television, video conferencing); transport (airspace/ aviation, autonomous vehicles, driver/vehicle recognition); medical sciences (biomechanics, drug discovery, genetics/genomics, medical imaging, neuroscience, public health), accounting for 42% of all AI-related patents. The majority of AI-related patent applications are filed with patent offices in the United States (152 981 applications) and China (137 010 applications). Applications under the WIPO Patent Cooperation Treaty account for 20% (67662) of the total number of AI-related applications (World Intellectual Property Organization (WIPO) (2019).

Currently, national laws and regulations do not provide an explanation of the term AI, nor is there a common definition of the term in different legal

sources worldwide. Artificial intelligence is in fact considered as a descriptive system with intelligent behaviour based on the ability to analyse the environment and take actions or decisions with a certain degree of autonomy in order to achieve specific goals. AI systems can be purely software-based (e.g. virtual assistants, image analysis systems, search engines, speech and facial recognition systems) or embedded in hardware, such as robots, autonomous machines, unmanned aerial vehicles or Internet of Things applications (European Commission, 2018). Professor Andreas Kaplan and Professor Michael Henlein (ESCP Business School, Paris, Sorbonne Alliance) define AI as "the ability of a system to correctly interpret external data, learn from such data and use this knowledge to achieve specific goals and objectives through flexible adaptation" (Kaplan & Haenlein, 2019). AI is also understood as technology that performs certain tasks that would otherwise require human intelligence. According to the English mathematician Alan Turing, a device (program) can be considered to be an artificial intelligence if it can successfully pretend to be a human neutral observer (Turing, 1950).

AI systems rely heavily on data and consequently need to access and use data, which may consist of images, songs or human creations that are protected as intellectual property. So, in general, it can be concluded that the main task of AI is to achieve the task at hand and to facilitate human activities by extracting human-generated knowledge and information.

However, AI technology has developed to such an extent that AI itself, while functioning as a real human intelligence and yet not being a natural person, is capable of creating objects, and in practice this object is no longer created by a physical platform, but by an object created by a natural person and possessing the characteristics of human intelligence. Thus, the AI object itself is capable of creating new, original works which could accordingly be assimilated to a work created by a natural person.

The conflict in the various legal systems of the world has been exacerbated by the issue of the grant of patent rights to DABUS (Device for the Autonomous Bootstrapping of Unified Sentience), an artificial intelligence system developed by Stephen Thaler. It envisaged two separate inventions without human intervention, and therefore AI was named as an inventor in patent applications for these inventions. The proposal to attribute inventions to AI not only created new legal challenges, but also divided the global IP community as to whether AI can or should be allowed to be named as an inventor for patents related to inventions made using AI (Thaler, 2015). This is a striking example of the constant movement of the

technological world which has shaken the stability of the legal system. The IP legal system must therefore respond to the challenges posed by these developments in a flexible manner, minimising the negative impact but at the same time ensuring that innovation and new technologies are encouraged.

Eran Kahana, an intellectual-property lawyer at Maslon LLP and a fellow at Stanford Law School, disagrees: "The machine is just a tool. That is all it is. The tool can be phenomenal, but it's just a tool that is used by a human being". Just as a monkey does not, and cannot, grant copyright to AI (Cullinane, 2018).

There are also opinions that AI is nothing without human input. The algorithms that run a company are based on the expertise of programmers and it is nothing more than a tool, albeit a powerful one, that scientists and engineers can use to solve problems.

And yet, sometimes, these computer programmes are programmed to demonstrate skills that their creators have not learned. This process is often automatic and independent of human intervention. Consequently, there are views that 'authorship' (the right to be recognised as the author) should be redefined to include both human and non-human authors. For example, Ryan Abbott, Professor of Law and Health Sciences at the University of Surrey Law School in the UK, argues that granting invention and authorship to non-humans are innovative new ways to foster the growth and development of AI (Abbott, 2016). These are important issues that need to be addressed to better prepare for an increasingly automated future.

As the use of AI in various fields, including creative fields, is growing, and in order not to hinder its benefits, a legal solution is needed, also on complex issues such as property rights. Our legal framework must therefore adapt to the realities of today's world, and quickly.

To avoid fragmentation of the Single Market and diverging national rules and guidelines, a Regulation of the European Parliament and of the Council establishing harmonised rules in the field of artificial intelligence (AI Act) and amending certain Union legislative acts is currently under preparation, strengthening the EU's competitive edge by encouraging confidence in the safety and reliability of AI, to strike a balance between public protection and business incentives to invest in innovation. In particular, the European Commission proposes to assess the impact and implications of AI and related technologies under the current system of patent law, trademark and design protection, copyright and related rights, including the applicability of legal protection of databases and computer programs, the protection of

undisclosed know-how and business information ('trade secrets') against unlawful acquisition, use and disclosure, the need for a more comprehensive legal framework for the economic sectors in which AI is involved, thus allowing European companies and relevant stakeholders to expand their activities, and the need to create legal certainty; stresses that the protection of intellectual property must always be reconciled with other fundamental rights and freedoms (European Parliament, 2020).

4. Case Thaler v Comptroller General of Patents

Can an artificial intelligence (AI) be an inventor, and can its owner apply for a patent? These were the two main questions asked by the UK Court of Appeal in Thaler v Comptroller General of Patents, the so-called DABUS case (England and Wales Court of Appeal (Civil Division) Decisions, 2021). Dr. Thaler is the owner of an artificial intelligence apparatus called DABUS and had invented two inventions. He filed a patent application with the UK Intellectual Property Office naming DABUS as the inventor and claimed ownership of the patents himself on the basis that the inventions invented by the machine should be assigned to its owner. The UK Intellectual Property Office refused to register the AI machine as an inventor because only a natural person can be an inventor of a patent within the meaning of the UK Patents Act. The UK court also rejected the patent applications for DABUS. The Court held that an artificial intelligence is not a natural person and therefore cannot be construed as an inventor under the UK Patents Act 1977.

The applications designating the DABUS AI system as the inventor were filed in several jurisdictions, including the European Patent Organisation. A similar decision was taken by the European Patent Office (EPO) to abandon these patent applications because they named the AI system as the inventor. As the EPO Board of Appeal pointed out in its decision, under the European Patent Convention (EPC), the inventor named in a patent application must be human. Under the EPC, the designation of an inventor is a formal requirement to be fulfilled by a patent application under Articles 81 and 19(1) of the EPC (European Patent Convention, 1973). The assessment of this formal requirement takes place prior to and independently of the examination of the merits and does not include any consideration of whether the subject matter of the application meets the requirements of patentability. In its decision, the EPO Board of Appeal held that the name submitted by the applicant did not comply with Article 81 of the European

Patent Convention for two reasons. First, it concluded that only a human inventor could be an inventor within the meaning of the EPC. Second, the device could not confer any rights on the applicant. Therefore, the claim that the claimant is an assignee because he owns the machine does not meet the requirements of Article 81 of the EPC in conjunction with Article 60(1) of the EPC (European Patent Convention, 1973).

Also, the US Supreme Court ruled that the word "individual" should be understood as a natural person, thus under the US legal system, only a person can be an inventor. Similarly, the German Patent Office refused to allow Ms Thaler to register the applications, which led to the case being brought before the German Federal Patent Court, which ruled that AI inventions are patentable but that a natural person must be named as the inventor (European Patent Office, 2021).

On 30 July 2021, Judge Jonathan Beach of the Federal Court of Australia issued a decision in the Stephen Thaler and Commissioner of Patents case which allowed AI to be considered as an inventor, stating that an inventor can also be an AI system or device (Abbott, 2021). This court decision confirmed that AI can be an inventor under the Australian regime, but contradicts decisions in the UK, the European Patent Office (EPO) and the US which have held that the inventor must be a natural person.

Although the US, UK courts and the EPO Board of Appeal have consistently held that inventors must be natural persons, given the decisions in South Africa and Australia confirming AI machines as inventors and the rapid development of technology, it is foreseeable that legislators and courts will increasingly face questions about the extension of patent rights.

Conclusions

While AI raises numerous questions in the legal community, its importance cannot be doubted: AI is the fastest growing technology in the world, with the potential to transform people's lives and contribute to national economies. In the US, for example, 13.2 million of the patents and applications currently registered are related to AI (The United States Patent and Trademark Office's (USPTO), 2021).

Taking into account the distinction between AI-assisted human creations and AI-created works, it is AI-created works that raise new regulatory challenges for IPR protection, such as issues of ownership, inventiveness

and appropriate remuneration, as well as issues related to potential market concentration. Furthermore, it is considered that intellectual property rights relating to the development of AI technologies should be distinguished from intellectual property rights relating to works created by AI. Where AI is used only as a means to assist the author in the creation process, the current IP framework should continue to apply.

It should be noted that there are concerns that redefining authorship by granting copyright to non-human authors would shake the current legal system and create further uncertainty. For example, unlike human authors, who have a lifetime limitation, AI programs could exist in perpetuity. This assumption challenges the previously established term of copyright protection granted to authors (life of the author plus 70 years in the US).

Today's advanced AI systems have "created" countless works, including musical compositions, art, compositions, recipes and potentially patentable inventions. However, most national legal frameworks and IPR policies reject the idea of non-human authorship or inventiveness. On the other hand, inventors do not necessarily own patents; in fact, most patents are owned by companies. Ownership rights can be transferred from an individual to a corporation by agreement or by operation of law.

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