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Constitutional Guarantees of Intellectual Property Protection in the Context of Digital Transformation: Ukrainian Experience

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The purposes of this research are to determine the legal status of intellectual property in the context of digital transformation; to analyse the role of innovative digital technologies in the legal regulation of intellectual property issues; to provide a detailed description of the measures of constitutional protection of intellectual property in the context of digital transformation in Ukraine; to systematize knowledge about constitutional guarantees of intellectual property

protection; to determine the role of specialised courts in ensuring intellectual property protection; to provide specific proposals for the development of the legal framework for intellectual property protection. An important aspect of the current study is an in-depth analysis of the challenges and threats of digital transformation to intellectual property. In order to achieve this purpose, the following methods were used: the general philosophical method, the method of system analysis, synthesis, the dialectical method and the formal logical method, the method of deduction and induction. These methods have been used to formulate scientifically significant and practical conclusions on proposals for improving intellectual property legislation in line with the challenges and threats of digital transformation, as well as to provide interim conclusions in accordance with the research purpose.

Keywords: intellectual property, digital transformation, constitutional guarantees, copyright, artificial intelligence.

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Introduction

High social and economic development of the state is achieved by means of various factors and conditions, one of which is the direct existence of an internationally recognised intellectual property system adapted to the realities of today. The existence of constitutional guarantees and mechanisms for the protection of intellectual property is a catalyst of various changes and transformations in the country, development of creative talents, achievement of new inventive results, support and preservation of the national potential itself, which further guarantees the attraction of investments in certain areas, as investors will be confident in the protection and respect for their rights. Taken together, such coordinated actions are aimed at stabilising the economic situation of the state and its place among other states at the international level as a country with high scientific, technical and intellectual potential.

In accordance with the provisions of Article 54 of the Constitution of Ukraine¹, every citizen is guaranteed freedom of literary, artistic, scientific and technical creativity, protection of intellectual property, their copyrights, moral and material interests arising from various types of intellectual activity. Moreover, every citizen is guaranteed the right to use the results of his or her intellectual and creative activity.

¹ Constitution of Ukraine (28.06.1996). Available: <https://www.president.gov.ua/documents/constitution> [last viewed 20.01.2024].

No one else has the right to use or distribute these results without the consent of such a citizen, because in the exceptions provided for by law. The very concept of “intellectual property” arose as a result of many years of practice of scientific, technical, creative and literary developments and achievements that required legal recognition of the right of individuals to the results of their activities in a particular area².

In a broad sense, intellectual property is understood as the rights provided for by law and enshrined in it, which are considered to be the result of intellectual activity in the scientific, literary, industrial and artistic fields. As a rule, the term “intellectual property” is understood as specific rights to the results of one’s intellectual activity in the field of science, technology, industry, art and other fields, which are the objects of civil law relations in terms of the right of everyone to own, use and dispose of the results of their intellectual and creative activity. This is not a material benefit, but the creators necessarily retain the above rights. Use by other persons is permitted subject to the permission of the relevant person, except as expressly provided by law^{3,4}. Intellectual property can be divided into four groups:

1. Copyright and related rights, which include artistic and literary works, computer programs, various databases, phonograms, videograms, and broadcasting programmes.
2. Industrial property objects, including utility models, inventions, industrial designs, rationalisation proposals, and layouts (topographies) of integrated circuits.
3. Breeds of animals and plant varieties are considered to be a creative result and, subject to compliance with the law, are objects of intellectual property. In general, their legal regime is equivalent to industrial property objects.
4. Trade names, trademarks, trade secrets, geographical indications. To be more precise, these objects are not results of activity, but in terms of their legal regime, they are equivalent to industrial property objects^{5,6}.

In Ukraine, the above is regulated by the Civil Code of Ukraine⁷, the Laws of Ukraine “On Copyright and Related Rights”⁸, “On Protection of Rights to Trademarks and Service Marks”⁹, “On Protection of Rights to Industrial Designs”¹⁰, “On Legal

² Bryntsev, O., Kokhan, V., Mamaiev, I., Novikov, Y., Pasmor, Y., Shevchenko, L., Shmatkov, D., Vodoriezova, S., Yefremova, K. Basic aspects of digitalization and their legal provision. Kharkiv: Research Institute of Law, National Academy of Sciences of Ukraine, 2021.

³ Kostiuchenko, O. Legal Regulation of Intellectual Property in Ukraine. Available: https://minjust.gov.ua/m/str_4487 [last viewed 20.01.2024].

⁴ Kravchenko, O. International Experience of Regulatory and Legal Protection of Commercial Business Secrets. *Philosophy, Economics and Law Review*, Vol. 3, issue 1, 2023, p. 289.

⁵ Kostiuchenko, O. Legal Regulation.

⁶ Kravchenko, O. International Experience, p. 289.

⁷ The Civil Code of Ukraine (16.01.2003). Available: <https://zakon.rada.gov.ua/laws/show/en/435-15?lang=uk> [last viewed 20.01.2024].

⁸ Law of Ukraine “On Copyright and Related Rights”, No. 2811-IX (01.12.2022). Available: <https://zakon.rada.gov.ua/laws/show/2811-20> [last viewed 20.01.2024].

⁹ Law of Ukraine “On Protection of Rights to Trademarks and Service Marks”, No. 3689-XII (15.12.1993). Available: <https://zakon.rada.gov.ua/laws/show/3689-12#Text> [last viewed 20.01.2024].

¹⁰ Law of Ukraine “On Protection of Rights to Industrial Designs”, No. 3688-XII (15.12.1993). Available: <https://zakon.rada.gov.ua/laws/show/3688-12?lang=en#Text> [last viewed 20.01.2024].

Protection of Geographical Indications”¹¹, “On Protection of Rights to Integrated Circuit Designs”¹², “On Protection of Rights to Inventions and Utility Models”¹³, etc.

Today, scientists, government agencies and inventors dedicate much attention to the protection of intellectual property. Stimulating the development of various vectors of science and technology is one of the most progressive directions, and therefore easily becomes one of the most advanced and important factors of political and economic relations and economic security both within each developed country and in international relations. Given the rapid pace of modern technology development and large-scale digital transformation (note that digital transformation involves the adoption and implementation of advanced digital tools, technologies and processes to increase the efficiency, effectiveness and reach of copyright management and law enforcement agencies), the issues pertaining to protection and enforcement of intellectual property rights are gaining even greater momentum and wider horizons. At the same time, the transformation of digital technologies and the modification of every sphere of society’s life encourage many unscrupulous individuals and organisations to violate intellectual property laws by means of piracy, plagiarism, and counterfeiting of certain information. Piracy has become so widespread that many people do not even realise that they are becoming active consumers of pirated services.¹⁴ Hence, this is explored in more detail in the following sections.

The above is a direct indication that although Ukraine has an established legal framework governing intellectual property issues, at present there still remains a large number of unresolved issues, given the rapid pace of digital transformation. However, despite the existence of certain problems, the state policy is implemented with due regard for the constitutional rights of citizens to protect intellectual property and ensure favourable conditions for the creation thereof. This is confirmed by the great efforts to improve legislative regulations, adapt legislation to new realities and eliminate conflicts in law.¹⁵ Much attention is paid to cooperation between various government agencies, including the judiciary, as a way of constitutional guarantee of intellectual property rights protection.

Given the above, there are several purposes of this research: to determine the legal status of intellectual property in the context of digital transformation; to analyse the role of innovative digital technologies in the legal regulation of intellectual property issues; to provide a detailed description of the measures of constitutional protection of intellectual property in the context of digital transformation in Ukraine; to systematise knowledge about constitutional guarantees of intellectual property protection; to determine the role of specialised courts in ensuring the protection of intellectual property. An important aspect of the study is an in-depth analysis of the challenges and threats of digital transformation to intellectual property.

¹¹ Law of Ukraine “On Legal Protection of Geographical Indications”, No. 752-XIV (16.06.1999). Available: <https://zakon.rada.gov.ua/laws/show/752-14?lang=en#Text> [last viewed 20.01.2024].

¹² Law of Ukraine “On Protection of Rights to Integrated Circuit Designs” (05.11.1997). No. 621/97-BP. Available: <https://zakon.rada.gov.ua/laws/show/en/621/97-%D0%B2%D1%80?lang=uk> [last viewed 20.01.2024].

¹³ Law of Ukraine “On Protection of Rights to Inventions and Utility Models”, No. 3687-XII (15.12.1993). Available: <https://zakon.rada.gov.ua/laws/show/3687-12#Text> [last viewed 20.01.2024].

¹⁴ Intellectual Property Crime Threat Assessment Report. Available: https://www.europol.europa.eu/cms/sites/default/files/documents/Report.%20Intellectual%20property%20crime%20threat%20assessment%202022_2.pdf [last viewed 20.01.2024].

¹⁵ *Androshchuk, G. Digital Piracy and Counterfeiting in the Conditions of Digital Transformation: Analysis of the Situation, Trends, Defense Mechanisms. Theory and Practice of Intellectual Property*, Vol. 3, 2023, p. 103.

Methodological framework

In accordance with its purposes, this research has been carried out with due regard for the following methods of scientific knowledge: the general philosophical method, the method of system analysis, synthesis, the dialectical method and the formal logical method, the method of deduction and induction. The general philosophical method is a cross-cutting method of scientific research, which is used at all stages to formulate comprehensive conclusions and recommendations for improving legislation. The system analysis method has enabled the authors to determine the role of innovative digital technologies in the legal regulation of intellectual property issues, as well as to examine, which measures of constitutional protection of intellectual property in Ukraine should be applied in the context of rapid digital transformation.

By applying the synthesis method, the authors have arrived at a common vision of possible actions that the State can take on the way to improving intellectual property legislation. The authors also drew conclusions about the immediate challenges and threats of digital transformation to intellectual property. It is through the use of the method of systematic analysis and synthesis that scientifically significant and practical conclusions have been drawn regarding the constitutional guarantees of intellectual property protection and the role of courts in ensuring the protection of intellectual property. To achieve this goal, the authors also used the dialectical method of scientific research. This method was applied to identify and study in detail the problematic issues of providing constitutional guarantees of intellectual property protection in Ukraine. The dialectical method is employed to reveal the content of the challenges and threats that pose an immediate danger to intellectual property. Particular attention has been dedicated to piracy.

The formal and logical method of scientific knowledge was exercised as the leading method in identifying problematic aspects of responding to rapid technological changes in legislation. Using the method of deduction, the authors have concluded that despite the activities of public authorities aimed at improving the legislation on intellectual property rights, there still remain unresolved problems that require a quick response. The method of induction was used to draw conclusions about the challenges and threats faced by the state and citizens as a result of taking advantage of innovative technologies and their impact on intellectual property. Taken together, these methods helped to formulate not only scientifically significant conclusions, but also practical recommendations for improving intellectual property legislation.

Results and discussion

1. Guarantees of constitutional protection of intellectual property in the context of digital transformation

Modern times dictate new rules for the legal regulation of issues related to intellectual property, including its protection. Undoubtedly, rapid technological developments and the digitalisation of society have a number of advantages and disadvantages in terms of intellectual property. Ukraine is taking a number of measures at the state level to protect intellectual property from unlawful infringement, use and distribution. However, today there is still a need to amend the existing peculiarities of legal regulation of these issues, which will be discussed in more detail below. In the context of our study, it is necessary to carry out a detailed description of the constitutional guarantees of intellectual property protection in the context of digital transformation. The authors can easily include the following:

- Direct recognition of intellectual property rights – at the level of the Constitution, namely, Article 41 stipulates the right to own, use and dispose of one's property, the results of one's intellectual and creative activity.¹⁶ The constitutional recognition of these rights is the basis for legal protection thereof.
- Adaptation to the digital environment – provisions of many bylaws, regulations, and international commitments (for example, in the context of Ukraine's incipient accession to the European community) may emphasise the need to adapt existing laws to the challenges and opportunities posed by digital technologies. This may include updating laws related to copyright infringement, digital piracy, software and database protection.¹⁷
- Striking a balance between public and private interests – at the level of laws and regulations, there is a desire to strike a balance between private and public interests, with provisions for fair use, access to knowledge and the promotion of innovation, ensuring that intellectual property rights do not unduly restrict the flow of information and creativity.¹⁸
- The special laws noted in the introduction contain provisions to protect intellectual property from unauthorised access, hacking, and other forms of cyber threats.
- Development of technology and innovation – at the level of state policy, technological development and innovation are strongly encouraged through various developments and research. Intellectual property protection is an effective way to stimulate innovation.¹⁹
- Active international cooperation, which in itself represents an increased regulation of the issue of intellectual property protection. There are some obstacles to the rapid adaptation of national legislation to international norms, but a number of steps have already been implemented and embodied in the existing regulations²⁰.
- Access to fair justice – everyone has the right to go to court for protection, if their rights are infringed. Intellectual property rights are no exception.
- The authors consider it appropriate to describe in greater detail the role of courts in ensuring the protection of intellectual property as one of the key aspects of the modern legal environment. The judicial method of protection involves a person who believes that his or her right has been challenged, unrecognised or violated, applying to a court. A court decision is binding and ensures effective protection of intellectual property rights. The advantages of judicial protection of intellectual property include, first and foremost, the fact that it promotes creativity and further technological developments, as it is a kind of confidence and protection against unauthorised use. In general,

¹⁶ Constitution of Ukraine (28.06.1996). Available: <https://www.president.gov.ua/documents/constitution> [last viewed 20.01.2024].

¹⁷ Dickenson, J., Morgan, A., Clark, B. Creative Machines: Ownership of Copyright in Content Created by Artificial Intelligence Applications. *European Intellectual Property Review*, Vol. 39, issue 8, 2017, p. 458.

¹⁸ An, I. Judicial Protection of Intellectual Property Rights. Available: <https://prikhodko.com.ua/my-i-zmi/my-i-zmi/stattya/sudovyj-zahyst-prav-intelektualnoyi-vlasnosti/> [last viewed 20.01.2024].

¹⁹ Matiuk, T., Mazurka, Y. Intellectual Property and Innovation as a Factor of Economic Development. *International Scientific Journal "Internauka"*, Vol. 4, issue 84, 2020, p. 23.

²⁰ An, I. Judicial Protection.

this contributes to the emergence of a potentially favourable environment where technologies and products are successfully developed and improved. Such an environment is quite attractive for investment, as investors have the assurance that their investments will bear results.

In this context, the guarantee of judicial protection of rights increases investor interest and helps to finance research and development initiatives. Another advantage is the fact that judicial protection, by its very nature, ensures that equal competition is maintained, while hindering the attempts to copy other people's creative solutions and research. This, in turn, is a good incentive to search for unique methods and approaches.²¹ Along with the positive aspects of judicial protection, there are certain negative facets. These include the long timeframe of litigation, which often lasts for several months or a year. It is quite logical that significant financial resources are required. For large companies, this will not be as great an obstacle as for small businesses and individual creators.

As of today, the High Court of Intellectual Property has been established in Ukraine, yet, unfortunately, it is not functioning. The purpose of this court is to professionally consider disputes in the field of intellectual property. Back in 2019, a competition for the position of a judge was launched, but after the liquidation of the High Qualification Commission of Judges (HQCJ), these processes were suspended and have not been resumed to date, although there are sufficient reasons for this²².

A rather effective mechanism is augmenting the procedural rules with the procedure for requesting information on the distribution and origin of services or goods that directly infringe intellectual property rights. The introduction of provisions on the destruction of goods seized by the court, manufactured or put into civil circulation in violation of intellectual property rights, is also a positive development.²³ Likewise, in determining the role of judicial protection, it is advisable to focus on injunctive relief. As a general rule, it enables prohibiting actions that directly threaten to infringe a person's right or actually violate it.

2. Challenges and threats of digital transformation to intellectual property

In the context of the protection of intellectual property rights, the authors consider it appropriate to analyse the challenges and threats arising from the active development of digital technologies and changes in the production and distribution of intellectual property. These include, first and foremost, the problem of controlling and protecting copyright, which results in piracy, distribution and consumption of pirated products, i.e. illegal use of content.²⁴ In general, commercial counterfeiting and digital piracy is a very serious problem – not only for Ukraine but for the entire global community. Infringement of intellectual property rights is a direct cause of immense financial losses, which entail the risk of undermining sustainable business

²¹ *Matiuk, T., Mazurka, Y.* Intellectual Property, p. 23.

²² *Kopolovets, D.* The Top 5 Challenges of IT Intellectual Property Protection. Available: <https://medium.com/@dkopolovets/the-top-5-challenges-of-it-intellectual-property-protection-c19192bb03f6> [last viewed 20.01.2024].

²³ *Strelnik, V. V., Kalita, A. V., Tarasenko, A. Y.* Protection of Intellectual Property Rights in Modern Conditions. Scientific Bulletin of Uzhhorod National University, Vol. 79, issue 1, 2023, p. 250.

²⁴ *Kuzheliev, M., Britchenko, I.* Theoretical and Methodological Aspects of Formation of Corporate Control System in Ukraine. *Ikonomicheski Izsledvania*, Vol. 25, issue 2, 2016, p. 18.

models based on intellectual property.²⁵ Considering social harm in general, it is manifested in the counterfeiting of medicines or medical equipment, which can lead to harmful consequences.²⁶

As for Ukraine, according to the NBU Centre for Social Communications Research, the level of computer piracy in Ukraine is 86%, while the global average is only 42%. According to the latest estimates of the NBU Centre for Social Communications Research, the level of software piracy in 2023 is 80%²⁷. Unfortunately, due to the circumstances that have developed in recent years, there are currently no large-scale efforts to reduce the use and consumption of pirated resources. However, some steps have been taken. For example, in 2022, the Law of Ukraine “On Amendments to the Code of Ukraine on Administrative Offences, the Criminal Code of Ukraine and the Criminal Procedure Code of Ukraine regarding Liability for Copyright and (or) Related Rights”²⁸ was adopted, which provides for changes to sanctions for copyright infringement, including an increase in the penalty for the offence. The new law also stipulates introduction of a new article to the Criminal Code of Ukraine, which directly deals with the financing of copyright infringement.

The next challenge concerns patents. Overall, the patents protect new technological inventions. With regard to digital technological changes, the patents are currently generally aimed at protecting computer technology or software. The problem lies in the difficulties associated with the overlap between patents protecting inventions and software that are directly related to artificial intelligence technology and algorithms.²⁹ Firstly, these challenges include the fact that, by its very nature, the legal framework for software patents is often inconsistent and differs from jurisdiction to jurisdiction, which leads to uncertainty for inventors and companies. Furthermore, the rapid pace of innovation in the AI field means that patent offices are struggling to keep up with the latest developments, potentially leading to delays and backlogs in patent approvals. The complexity of AI algorithms, which can be highly abstract and specialised, creates additional challenges in determining the novelty and non-obviousness required for patentability.³⁰

The authors would like to note the problematic aspects of the work of patent archives.³¹ Many archives are far from being easily accessible, which in turn makes it difficult for researchers and developers to find relevant prior art. This situation and lack of transparency can therefore hinder innovation as such, as it is an onerous task to determine whether an idea is truly new or has already been patented³². The next challenge follows from the previous statement and relates directly to artificial intelligence and machine learning technologies. Taken together, they are very powerful and effective tools of influence designed to solve various problems. Such

²⁵ Zolotar, A. S. The Current State of Intellectual Property Protection in the Context of Digitalisation “Actual Problems of State and Law”, 2022, p. 45.

²⁶ Ibid.

²⁷ Business calls on Ukrainians to use legal content on the Internet. Available: <https://eba.com.ua/biznes-zaklykaye-ukrayintsiv-korystuvatysya-legalnym-kontentom-v-interneti/> [last viewed 20.01.2024].

²⁸ Law of Ukraine “On Amendments to the Code of Ukraine on Administrative Offences, the Criminal Code of Ukraine and the Code of Criminal Procedure of Ukraine on Liability for Infringement of Copyright and (or) Related Rights”, No. 2803-IX (01.12.2022). Available: <https://zakon.rada.gov.ua/laws/show/2803-20#Text> [last viewed 20.01.2024].

²⁹ Bryntsev, O., Kokhan, V., Mamaiev, I., Novikov, Y., Pasmor, Y., Shevchenko, L., Shmatkov, D., Vodoriezova, S., Yefremova, K. Basic aspects of digitalization.

³⁰ Zolotar, A. S. The Current State, p. 45.

³¹ Ibid.

³² Ibid.

tasks may include copying and disseminating information that is directly protected by intellectual property. Moreover, artificial intelligence can raise ethical issues related to transparency, fairness, bias, and discrimination.³³

Artificial intelligence has given rise to a number of problematic issues for intellectual property. These include the problem of determining copyrights for intellectual property when using artificial intelligence, as well as the problem of almost identical fakes of works of art using artificial intelligence technologies. Theft, which manifests itself in the illegal use of industrial designs on the Internet, is a significant threat,³⁴ *inter alia*, duplication of interfaces, digital product design, or graphic design results. The threat of open-source software is becoming widespread. Open source is a code that is made available to the public and can be easily accessed. While this encourages new collaborations and funding for innovation, it has the side-effect of blurring the boundaries of property rights as such, and raises questions about the protection of intellectual property.

The proliferation of open-source software has disrupted traditional models of IP protection. While open-source software encourages collaboration and innovation, it also obscures the boundaries of ownership and raises questions about the ways to protect IP in a collaborative environment. This means that the source code of the software is freely available, which can make it difficult for businesses to protect their own code from being copied and used by others. Managing open-source contributions and ensuring compliance with licences can be challenging.³⁵

The threat to trade secrets is quite substantial, given the rapid technological changes, when the risks of hacking and data theft are extremely high. In general, such trade secrets are intended to protect information on certain formulas and business strategies that, by their very nature, can put their owner in a winning position against their competitors.³⁶ Another challenge is caused by the growing number of legal acts designed to regulate intellectual property issues. More does not always mean better. In most cases, it means inconsistency and conflicts.

Another problem is the global nature of digital technologies and the IT industry in general. Globalisation, by its very nature, significantly complicates the mechanisms for protecting intellectual property rights. Laws and regulations differ from one jurisdiction to another, making it difficult to navigate the legal field and protect IP on a global scale.³⁷ In the context of our study, it is necessary to note the problematic aspects of the use of blockchain technologies aimed at determining authorship in the absence of relevant legal provisions. There is a completely unobvious, but real problem in encrypting and providing some kind of access to old and historical works, the right to which cannot be identified.

³³ Moroz, V., Begaliyev, Y. Modern Aspects of the Use of Artificial Intelligence by the Armed Forces of Ukraine under Martial Law. *Philosophy, Economics and Law Review*, Vol. 3, issue 2, 2023, p.156.

³⁴ Androshchuk, H. O. Artificial Intelligence: Economy, Intellectual Property, Threats. *Theory and Practice of Intellectual Property*, Vol. 2, 2021, p. 64.

³⁵ Kopolovets, D. The Top 5 Challenges.

³⁶ Vakofian, V. G. Intellectual Property Issues in the Process of Digital Transformation of Entrepreneurial Activity. *Creation, Protection, Defence and Commercialisation of Intellectual Property Rights*, 2023, p. 139.

³⁷ Kopolovets, D. The Top 5 Challenges.

3. The role of intellectual property in the context of digital transformation and ways to improve intellectual property legislation in line with the challenges of the digital age

The understanding of intellectual property law is undergoing significant changes due to the large-scale digital transformation. Issues and problems related to the protection of both intellectual property and intellectual property rights in general are increasingly arising. However, today there is a certain number of scholars who are convinced that intellectual property is not in danger, and that technological developments have all the necessary mechanisms to protect intellectual property.³⁸ In the opinion of authors, which corresponds to the views of the majority of academics, the protection of intellectual property is not fully thought out. The authors argue that the current intellectual property system in the world is imperfect and believe that it should be changed on a large scale to one that, from the long-term perspective of open innovation and the movement towards open source, will be based on the principle of shared ownership, and consist of a knowledge-sharing infrastructure, a mechanism for distributing rewards among participants (inventors), and a mechanism for enhancing the benefits of the innovator.

To put it less radically, an appropriate and effective solution would be to make local improvements to legislation with mandatory justification of current changes and public awareness. It is worth analysing these issues in greater detail, as, based on current data and the principles of intellectual property rights, legal relations in the digital space generally concern copyright, utility models, inventions, trademarks, trade secrets and industrial designs.

Copyright in video content, graphic content or textual content is crucial for professionals and consumers who are tangentially or directly involved in the media sphere. The challenges of copyright protection in general stem from the fact that digital transformation has significantly affected the scope of video files and music files, thereby transcending them. For example, it is now possible to convert three-dimensional objects into certain digital files and easily reproduce them using a 3D printer or a similar device.³⁹

As for patents, they can now be obtained not only in the course of describing physical and visual embodiments, but also in the form of transferring CAD files intended for printing inventions. Various types of patents, which are often neglected due to higher costs and lengthy procedures, offer an indisputable strategy for protecting and controlling not only digital products themselves, but also new channels of information dissemination.⁴⁰ A more or less secure patent system is a contrast to the clearly demonstrated uncertainty in the field of copyright and trademarks in this period of digital innovation.

As for trademarks, they are the most frequently registered intellectual property objects in the world, and often constitute the central object of legal relations in the digital space. These range from a domain name to the sale of goods through various platforms and marketplaces. It can be noted that all the adopted laws on trademarks and service marks, as discussed above, can also be applied to legal relations in the digital

³⁸ *Strelnik, V. V., Demchenko, A. M., Myronenko, A. O.* Legal Combination of Intellectual Property Rights and Artificial Intelligence Technology. Private and Public Law, Vol. 4, 2020, p. 52.

³⁹ *Bryntsev, O., Kokhan, V., Mamaiev, I., Novikov, Y., Pasmor, Y., Shevchenko, L., Shmatkov, D., Vodoriezova, S., Yefremova, K.* Basic aspects of digitalization.

⁴⁰ *Romanchuk, T.* Problematic Issues of Intellectual Property Rights Protection in Ukraine. Available: <https://core.ac.uk/download/pdf/79660245.pdf> [last viewed 20.01.2024].

space.⁴¹ As of today, Ukraine allows for the possibility of applying the existing legal provisions governing intellectual property in the digital transformation era, although some provisions may be criticised and require changes. There is an option when a rational combination of various branches of law, such as information law, intellectual property law, digital economy instruments, etc., is proposed rather than a change or improvement of the existing legal framework or specific provisions.⁴²

Digital technologies and innovation are an indicator of development as such. Therefore, it is not surprising that the level of intellectual property development has a direct impact on changes in the organisation of private enterprise, government agencies, on the quantitative and qualitative characteristics of competitiveness institutions, economic culture, and, in a large-scale aspect, on the main indicators of changes in mentality.⁴³ In view of the above and taking into account the current state of legal regulation of intellectual property, the authors propose to improve Ukrainian legislation in the field of intellectual property and adapt it to the realities of today. The following steps would be appropriate:

- Protection of copyright in the digital environment – this involves finding and approving optimal mechanisms for determining copyright infringement in the virtual space, as well as mandatory implementation of international standards for copyright protection.⁴⁴ For example, the authors can consider the following mechanisms for determining copyright infringement – firstly, content recognition technologies. It is advisable to introduce content recognition algorithms that can automatically detect copyrighted materials on various digital platforms. Accordingly, such technologies can easily detect potential infringements and identify content that belongs to another author, and therefore allow for a faster response to such infringements. The authors suggest using digital watermarking and fingerprinting technologies to embed unique identifiers in digital content. This will be the basis for facilitating the authentication of intellectual property. Furthermore, the authors propose to develop a reliable and user-friendly notification and takedown system that will allow rights holders to easily report infringements. With regard to the implementation of international copyright standards, the authors to focus on the standards set out in the Berne Convention for the Protection of Literary and Artistic Works, European Union Directives, etc. These standards are manifested, in particular, in the requirements for digital platforms to obtain licences for copyrighted content, establish a fair use regime that balances the interests of right holders and users, and provide for civil and administrative procedures, penalties and remedies;
- Complicating the processes of illegal copying and dissemination of other people's intellectual property by imposing additional encryption, etc., including imposing stricter liability on those who commit such acts;⁴⁵
- Optimisation of public administration in the field of intellectual property. With this in mind, the authors propose several specific measures and strategies

⁴¹ Rybachek, V., Tsupor, D. Issues of Improving the Legislation of Ukraine in the field of Intellectual Property Rights. Available: <http://dspace.onua.edu.ua/bitstream/handle/11300/15208/Рибачек%20В.К.%2С%20Цупор%20Д.І..pdf?sequence=1&isAllowed=y> [last viewed 20.01.2024].

⁴² Intellectual Property Crime Threat Assessment Report. Available: https://www.europol.europa.eu/cms/sites/default/files/documents/Report.%20Intellectual%20property%20crime%20threat%20assessment%202022_2.pdf [last viewed 20.01.2024].

⁴³ Strelnik, V. V., Kalita, A. V., Tarasenko, A. Y. Protection of Intellectual Property Rights, p. 250.

⁴⁴ Polishchuk, Y., Ivashchenko, A., Britchenko, I., Machashchik, P., Shkarlet, S. European Smart Specialization for Ukrainian Regional Development: Path from Creation to Implementation. Problems and Perspectives in Management, Vol. 17, issue 2, 2019, p. 382.

⁴⁵ Strelnik, V. V., Kalita, A. V., Tarasenko, A. Y. Protection of Intellectual Property Rights, p. 250.

- that can be implemented to achieve this optimisation. These include: creating a single central digital register of intellectual property; introducing a single and convenient mechanism for filing applications for intellectual property rights; strengthening interagency coordination to help combat intellectual property rights infringement; ensuring public reporting, transparency and accountability, etc;
- Adaptation of legal norms on patenting technologies related to artificial intelligence, including the development of specific criteria for determining the ownership of technologies created with the use of artificial intelligence;⁴⁶
 - Data confidentiality and security – this refers to the direct development of regulations aimed at regulating the collection, processing and use of intellectual property data, determining the mechanisms that will be used directly to protect information;
 - Flexibility of legislation – first of all, it concerns patent legislation, and the main emphasis is to promote innovation in all possible ways by reducing the cost of obtaining patents;
 - Ensuring proportionate, effective and dissuasive sanctions for copyright and related rights infringement. Examples of such sanctions include: establishing a multi-level system of penalties, including fines, which should be fair and consistent; ensuring the effectiveness of sanctions through transparent courts; creating separate units in law enforcement agencies that will focus exclusively on IP infringements; conducting regular reviews and assessing the effectiveness of sanctions in deterring infringements, etc;⁴⁷
 - Encouraging innovation in blockchain technologies – this involves developing legal frameworks for defining ownership and protecting rights in the field of blockchain technologies; it is also important to ensure a good interaction between intellectual property law and regulation of the cryptocurrency and blockchain industries.⁴⁸

Summary

The concept of “intellectual property” is understood as specific rights to the results of one’s intellectual activity in the field of science, technology, industry, art, and others, which are the objects of civil law relations in terms of the right of everyone to own, use, and dispose of the results of their intellectual and creative activity. This is not a material good, but the creators necessarily retain the above rights. Use by other persons is permitted subject to obtaining the permission of the relevant person, except as expressly provided by law. Given the rapid pace of development of modern technologies and large-scale digital transformation, these issues of protection and enforcement of intellectual property rights are gaining even greater momentum and wider horizons. At the same time, the transformation of digital technologies and the modification of every sphere of society’s life encourage many unscrupulous individuals and organisations to violate intellectual property laws.

The main constitutional guarantees of intellectual property protection in the context of digital transformation include: direct recognition of intellectual property rights; adaptation to the digital environment; maintaining a balance between public and private interests; special laws mentioned in the introduction contain provisions on protection of intellectual property from unauthorised access, hacking

⁴⁶ Strelnik, V. V., Demchenko, A. M., Myronenko, A. O. Legal Combination, p. 52.

⁴⁷ Bryntsev, O., Kokhan, V., Mamaiev, I., Novikov, Y., Pasmor, Y., Shevchenko, L., Shmatkov, D., Vodoriezova, S., Yefremova, K. Basic aspects of digitalization.

⁴⁸ Britchenko, I., Cherniavska, T. Blockchain Technology in the Fiscal Process of Ukraine Optimization. Ikonomicheski Izsledvania, Vol. 28, issue 5, 2019, p. 143.

and other forms of cyber threats; development of technologies and innovations; active international cooperation, which in itself represents an increased regulation of the issue of intellectual property protection; access to fair justice. The main challenges and threats include the emergence of piracy, distribution and consumption of pirated products, i.e., illegal use of content; difficulties associated with overlapping patents for the protection of inventions and software directly related to artificial intelligence technology and algorithms; problematic aspects of patent archives; copying and distribution of information directly protected by intellectual property; the problem of determining copyright for the results of intellectual activity when using artificial intelligence; the problem of almost identical forgeries of works of art with the help of artificial intelligence technologies; plagiarism, manifested in the illegal use of industrial designs in the Internet environment; the threat of distribution of open source software; threat to commercial secrets; a challenge caused by the growing number of normative legal acts designed to regulate intellectual property issues; the global nature of digital technologies and the IT industry in general; moments of using blockchain technologies aimed at determining authorship in the absence of relevant legal norms; deciphering and providing one or another access to old and historical works, the right to which cannot be identified.

In view of the above and taking into account the current state of legal regulation of intellectual property, the authors propose the improvement of Ukrainian legislation in the field of intellectual property and its adaptation to the realities of today. It will be appropriate to take the following steps: copyright protection in the digital environment; complicating the processes of illegal copying and distribution of other people's results of intellectual activity by imposing additional encryptions, etc., including the imposition of stricter responsibility on persons who carry out such actions; optimization of state management in the field of intellectual property; adaptation of legal norms regarding the patenting of technologies related to artificial intelligence; data privacy and security; ensuring the flexibility of legislation; provision of proportionate, effective and deterrent sanctions for infringement of copyright and related rights; encouraging innovation in the field of blockchain technology.

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