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## INFORMATION TECHNOLOGIES FOR ENSURING PROTECTION OF INTELLECTUAL PROPERTY RIGHTS: ADMINISTRATIVE AND LEGAL ASPECTS

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The article is devoted to a comprehensive study of technologies designed to protect intellectual property rights. The scientific basis for the study of information technologies for ensuring the protection of intellectual property rights is analyzed.

Attention is paid to the close connection between the development of information technologies and challenges to the protection of intellectual property. This issue is considered in the context of administrative and legal aspects of such protection. The author formulates proposals aimed at improving administrative and legal acts in the area under study.

The trends in the development of intellectual property law are analyzed, revealing a range of directions for its further advancement, notably expressed in the processes of globalization of legislation and the transition from protecting rights fixed on material carriers to protection of information. Emphasis is placed on the fact that the transfer of modern technologies is one of the main avenues for the creation and utilization of intellectual property, which is also provided for in international legal acts.

The stimulation of creating fundamentally new technologies and developments, along with their broad industrial utilization, greatly depends on a systematic approach to structuring the strategy for the development of the national innovation system. This system integrates fundamental scientific research and the commercialization of their results, employing legal mechanisms for the circulation of property rights over intellectual property objects.

Particular attention is paid to the legal regime of blockchain protection. Attention is drawn to the complexity of legal protection of the blockchain, which consists of both information and intellectual property. It is indicated that this object is a system for recording, storing and processing information and a technology for performing actions in the digital environment. It is proved that blockchain is a value associated with objects with exclusive rights and has the ability to issue invoices. It is emphasized that blockchain can be considered within the framework of the Law on Information – as an information product in the form of a document containing information.

**Key words:** intellectual property; innovative activity; administrative and legal regulation; intellectual property protection; information technology; blockchain; administrative liability.

**Problem statement.** Modern society is at the stage of a global transition to a new technological order associated with the “digital economy” and the “digital revolution”, the features of which are determined not only by changes in technology, but also, to no lesser (if not greater) extent, by the state of

public institutions, including forms and models of economic organization, mechanisms of public administration, as well as public systems of values and ideologies.

Digital technologies create a new reality that is different from the physical world we live in. They create a new technological environment in which such social phenomena as law and the system of law operate. Moreover, digital technologies are beginning to dictate their own conditions, to which legal institutions, in particular the institution of intellectual property law, need to adapt.

**Analysis of the research problem.** The problems of administrative and legal ensuring the protection of intellectual property rights was studied in the works of such scholars as: V. Averianov, V. Bevzenko, A. Berlach, A. Borko, N. Bortnyk, M. Verbenskyi, V. Halunko, O. Holiashkin, K. Hutsenko, S. Yesimov, I. Zozulia, N. Kaminska, T. Kolomoyets, V. Kolpakov, A. Komziuk, O. Kuzmenko, K. Levchenko, N. Lytvyn, O. Mykolenko, O. Ostapenko, H. Rymarchuk, I. Sydoruk, V. Synchuk, O. Syniavska, O. Sokolenko, S. Stetsenko, I. Khomyshyn, N. Khrystynchenko, Yu. Shemshuchenko, I. Shopina, Kh. Yarmaki, and others. These scientists have made a significant contribution to the development of the problems of ensuring the protection of intellectual property rights.

**The purpose of the article** is to analyze the administrative and legal aspects of intellectual property protection in the context of widespread introduction of information technologies and the challenges caused by them, based on the analysis of the regulatory framework for intellectual property regulation and the practice of its application.

**Presentation of the main material.** Often, the gap between the real and digital worlds does not allow us to use all the available information produced by a multitude of smart devices around the world. In order to bridge this gap and to more fully realize human potential, *augmented reality (AR)* technologies are used. The new digital reality is already manifested in the widespread use of high-speed industrial Internet (*internet of things*), integrated industrial networks and artificial intelligence, automatic identification services, collection and processing of global databases (*big data*), cloud services and computing (*cloud computing*), smart robotic systems (*smart everything*), the development of social networks, various IT platforms and services in the digital environment [1].

The advent of novel digital technologies has catalyzed the emergence of a fresh legal regulatory framework, characterized by key technological determinants:

- Internet of things, industrial internet (*internet of things*);
- *artificial intelligence* and machine learning and robotics;
- virtual and *augmented reality* technologies, quantum technologies and neurotechnologies;
- technologies based on the principles of a distributed ledger (*blockchain*), cryptocurrency, tokens, miners, smart contracts, ICOs ...;
- global databases (*big data*);
- cloud computer services and computing (*cloud computing*);
- “smart” systems and devices (*smart everything*);
- social networks (*Facebook, Twitter, Telegram...*);
- cyberspace, e-commerce, e-sports, cyberfake, e-government and cybersecurity [2].

Over the next few years, a new technology, blockchain, is expected to replace many of today's digital platforms. Since digital distribution is the basis of almost every modern service, distributed ledger technology (blockchain) will become a major factor of influence, just as the Internet was in its time. The concept of *blockchain* technology was first introduced by Satoshi Nakamoto in 2008 to create the digital currency *bitcoin*. Satoshi Nakamoto is the pseudonym of an unknown inventor who claims that anonymity is needed to protect both himself and industrial technologies and ways of organizing the social sphere. Today, new types of cryptocurrencies are constantly being created (*litecoin, Dash, Zcash, etc.*), some of which have reached impressive market capitalizations. These currencies are also being recognized as a

means of payment for the largest market participants, such as *Amazon* and *Hotels.com*. At the same time, *blockchain* technology supports much more than just cryptocurrencies. With the launch of the *ethereum* technology platform and the corresponding ether token (ETH) in 2015, it became possible to build blockchain applications for practical use in any sector of the economy: to carry out any transaction using smart contracts (whether it is traditional (“fiat”) money, goods or gold, or oil, energy, real estate and even intellectual property rights) [3].

The advantage of using blockchain for transactions lies in its ability to conduct transactions quickly, in a decentralized and secure manner, without intermediaries (brokers, agents). Data is typically stored in the blockchain in a reliable and immutable form. In the field of intellectual property, the use of blockchain technology enables the resolution of a number of problematic issues, primarily in the realm of copyright and related rights. Among these issues, the following can be highlighted:

- *blockchain protection* allows for more reliable registration of intellectual property rights, which leads to a reduction in the number of disputes, facilitates the collection of royalties, etc;
- *blockchain authentication* enables the detection of counterfeit or forged goods. Currently, several blockchain applications have been developed for tracking and identifying products, such as diamonds or luxury items, to detect counterfeiting. For instance, applications like *Blockverify*, *Everledger*, and *VeChain*, the latter being a solution for managing the supply chain of goods, can be used to track each item (product) throughout its production and distribution process;
- *a smart contract* represents intelligent blockchain code for ensuring the reliability of agreements and preserving information about them, including the protection of rights and interests of rights holders, such as a blockchain application for legally binding smart contracts, which are concluded and executed using artificial intelligence and recorded on a public blockchain. “Smart” registries may include information necessary for potential licensees (including information about license fees, terms, and usage restrictions). Blockchain registries can also facilitate the creation of smart licensing agreements that are automatically executed, including payment of license fees and registration of licenses in the registry. The same applies to other types of agreements, transfers of rights, or creation of encumbrances. Digital timestamps, “attached” to each agreement, could guarantee full traceability and verifiability of intellectual property rights in digital asset circulation;
- *maintaining IP registries and services* is a way to replace all existing centralized IP registries with decentralized systems using blockchain technology, where records will become more reliable and changes will be made almost instantly.

Blockchain-based IP registries can be a real way for rights holders to strengthen control over intellectual property rights, legitimate interests, and copyrighted works themselves. This is especially true for owners of copyrighted online content. Public blockchain registries contain all the information about the full chain of rights holders and the transfer of rights to IP objects, which will ensure transparency, security, and proof of authors’ rights, users’ rights, and rights holders’ rights.

In other words, blockchain technology can act as a legal instrument (funds):

- for the recognition of intellectual property rights and registration of objects of these rights – *a digital certificate of authenticity*;
- management of intellectual rights and objects of these rights, including their commercialization or other practical use (for example, in cases of free use or *fair use*);
- ensuring and protecting intellectual rights and property interests of the right holders;
- disposal of the exclusive right;
- introduction of exclusive rights into digital property circulation.

However, blockchain technology is not a perfect product: blockchain currently requires a huge amount of computing power and, therefore, energy. The costs are significant when a limited number of transactions can be processed per unit of time. The strong point of blockchain technology is its “vandal resistance”, which is important for IP management: it is almost impossible to make adjustments to the blockchain system, but in some cases such adjustments may be required, for example, by court order.

One way or another, blockchain technologies have become a revolutionary way to protect copyrighted content and copyrights on the Internet and cyberspace in general, including their cataloging and commercialization. Maintaining state or other registers of rights based on blockchain technology will equate the reliability of copyright protection with the protection of industrial property.

The management of intellectual property rights using blockchain technology can also be viewed as a digital rights management (DRM) system that will provide right holders with more effective protection of their works in the digital environment over time. In most countries, rules have long been in place aimed at the technical protection of copyright works and the interests of rights holders through Digital Rights Management (DRM) technology to prevent circumvention of protection or content infringement, in accordance with the law.

For example, there are prescribed technical means of copyright protection, which recognize any technologies, technical devices or their components that control access to a work, prevent or restrict actions that are not authorized by the author or other copyright holder in relation to the work. The law effectively prohibits the creation of such technologies, technical devices or their components, as well as their use for the above purposes.

Articles 6 and 7 of Directive 2001/29/EC provide for provisions on technical means of copyright protection, including electronic means, and information on the management (disposal) of rights. These provisions require Member States to provide legal protection against “acts of circumvention of any effective technological measures” and “any acts aimed at removing or altering any information on rights management” [4]. Not only the EU, but also many other countries have similar rules based on the WIPO Copyright Treaty, which has been ratified by 96 member states, including the United States. These provisions can also be applied to blockchain technologies and encourage the convenient use of such systems for right holders.

Blockchain technologies are also important for the formation of blockchain (electronic) rights registers, which confirm digital rights to objects specified in such registers by maintaining relevant records, codes (a certain sequence of characters). Regardless of whether blockchain registries are created by private companies or public authorities, the legal status and legal significance of such electronic registries should have the same legal force and properties of a digital record as prima facie evidence that certifies the authenticity of a digital record of an electronic registry.

It is necessary to establish the procedure for challenging these records by rights holders or users and the mandatory procedure for executing a record fixed on the blockchain platform. Any IP management scheme that will operate on blockchain technology requires the allocation of sufficient funds for the functioning of such a system, including the payment for such services (registration actions) in accordance with current legislation.

Digital technologies create a technological space, environment, and new legal regulation. Many countries that promote the development of the digital economy are formulating strategies in this area, for example: *The Digital Single Market Strategy* (EU), the formation of the EAEU Digital Single Space (since 2014), international e-commerce under UNCITRAL rules, the Strategy for the Development of the Information Society in Ukraine [5] (hereinafter – the Strategy), which aims to create a digital economy.

The Strategy defines the digital economy as an economic activity in which the key factor of production is digital data, the processing of large volumes and the use of the results of analysis of which, compared to traditional forms of management, can significantly increase the efficiency of various types of production, technologies, equipment, storage, sale, delivery of goods and services.

The areas of application of digital technologies include:

- financial and banking sector (Fintech);
- education and professional development (EdTech);
- healthcare and medicine (HealthTech);
- intelligent energy (Internet of Energy, IoE);
- digital law enforcement (LegalTech) or (RegTech);

- creation and development of global technology centers of international level for the formation of new markets to stimulate national business opportunities (International Tech Hubs);

The new technological environment has led to the intensification of lawmaking in this area. There is a need to supplement the Civil Code of Ukraine, which actually provides for the creation of a fundamentally new civil law institution – digital law.

The aim of such legislative initiative should be the incorporation into civil legislation of several fundamental provisions, from which the legislature could regulate the market of new objects of economic relations existing in the information and telecommunications network (such as “tokens”, “cryptocurrency”, etc.), provide conditions for the conclusion and execution of agreements in the digital environment, including agreements that allow the provision of arrays of information.

In the perspective of logical development, there is an objective need for the creation of an independent neoclassical legal direction, which utilizes not only traditional, classical institutes and legal constructs of private or public law. Essentially, this pertains to the “formatting” in the near future of digital law in a broad sense, not limited to classical civil law doctrine. This is confirmed by references to special laws that define the procedure for creating digital rights, the scope of their use, and the peculiarities of circulation.

Digital law should be understood as the totality of electronic data (digital code or designation) certifying rights to objects of civil law within a decentralized information system (the description of objects should be accessible to the owner of digital rights within the information system).

Thus, digital rights (instead of tokens) are recognized as a type of property rights. They will be able to certify rights to all objects of civil law (except immaterial goods) and participate in civil legal relations as tradable objects of civil rights.

Objects of digital rights do not include inalienable and non-transferable immaterial goods, which include: life and health, personal dignity, personal inviolability, honor, business reputation, privacy, inviolability of home, personal and family secrets, freedom of movement, freedom to choose a place of residence and domicile, citizen's name, authorship, and other immaterial goods belonging to a citizen from birth or by law [6].

The reasonableness of such a distinction between property rights and rights to intangible goods suggests the possibility of establishing digital human and civil rights alongside the political, social, economic and other rights guaranteed by the Constitution of Ukraine. In furtherance of this idea, it is quite timely to raise the issue of enshrining digital human and civil rights, for example: the right to digital immunity from “fake” information on the Internet, the right to protection of personal data and information about personal life, the right to cybersecurity, the right to free access to Internet communications, etc. [7].

It should be emphasized that “digital law” is a new legal fiction, which is close to a security in nature. Therefore, it is proposed to understand digital law as a set of electronic data (digital code, designation) that certifies rights to civil rights objects. On this basis, “digital law can only certify rights to things, other property, results of work, provision of services, and exclusive rights”.

We consider that the owner of digital rights is recognized as the individual who, by virtue of having unique access to the digital code, is capable of disposing of the digital right. Digital rights may be alienated or transferred from one person to another on the same terms as objects of civil rights, the rights to which they certify, with features established by legislation.

The transition to digital rights to objects of intellectual property rights is exclusively carried out by entering information into the information system (“distributed ledger”) about the transfer of the digital right to the acquirer. Encumbrances or limitations on the disposal of objects of intellectual property, the rights to which are certified by digital rights, arise solely upon entering information about encumbrances or limitations on the disposal of such digital rights into the information system. In other words, the circulation of “digital rights” will be conducted solely through the entry of records into the information system (“distributed ledger” – i. e., blockchain technology), including the possibility of buying and selling such rights. In this sense, a legal framework is created for the “digital circulation” of “digital rights” (which

encompasses “digital money” as well), consisting of sequential records of computer-executed code according to the rules of the distributed registry.

At the current stage of society's development, breakthrough innovative and information technologies are one of the reasons for irreversible, profound and transformative changes. The revolutionary nature of such changes not only affects the sphere of industry and production, but also penetrates the system of human-human relations, including human-machine relations not in the subject-object sense, but rather in the subject-subject sense. The special role of information and digitalization poses the task of finding new ways of interaction, building relationships and defining the boundaries of what is permissible, while preserving the fundamental understanding of law as the art of goodness and justice [8].

Intellectual property law is the cornerstone of the rapidly occurring changes, as it is the law that is most closely related to innovations and high technologies. Intellectual and information law will jointly give legal form to new “digital” constructions. Speaking about intellectual property law, it should be noted that the industrial revolution that gave rise to it marked a revolution in the attitude to the right of creativity, intellectual law as belonging to the world of ideas. The very name “intellectual property law” goes back to the identification of the right to matter and the right to intangible things, hence the concept of “property” characteristic of the world of things, which was later replaced by the term “intellectual rights” as more appropriate to the essence of this phenomenon. It can be said that this transition from the “material” understanding of intellectual property rights to the “ideal” one was also revolutionary, as are the changes that are taking place now. By analogy with the division of the development of science into periods of normal science and scientific revolutions, the digitalization of social relations is the same scientific revolution embodied in law. [9].

Thus, the rapid development of information and innovative technologies necessitates the search for new approaches to the interaction of law and technology, their interpenetration and influence. The task of law is to ensure the development of technologies by creating a legal basis for their implementation by maintaining a balance. Since intellectual property law is most closely related to digital technologies due to their intangibility, it is advisable to take into account the socio-cultural aspect in the legal regulation of intellectual rights, which is expressed in the development of the digital age, and as a result, in the variability of not only technology, but also law. At the same time, intellectual property law, in our opinion, needs a paradigm shift, since technology should not replace law, and is not able to do so. Therefore, it is advisable to focus not on the opposition of the virtual and real worlds, but on their cooperation, which can be expressed in the development of interdisciplinary approaches to scientific research [10].

Thus, the analysis of trends in the development of intellectual property rights has revealed a number of areas for its further development, which are manifested in the processes of globalization of legislation, the transition from the protection of rights fixed on tangible media to the protection of information [11].

The transfer of modern technologies is one of the main areas of creation and use of intellectual property, which is also provided for in international legal acts. Stimulating the creation of fundamentally new technologies and developments, their widespread industrial use largely depends on a systematic approach to structuring the strategy for the development of the national innovation system, which combines basic scientific research and involvement in economic circulation (commercialization) of their results, using the legal mechanism of circulation of property rights to intellectual property [12].

The formation of a conceptually unified “legal space” for administrative and legal regulation of relations in the field of intellectual property directly determines the effectiveness of the innovation development process itself. Adherence to a unified conceptual approach in formulating development strategies will significantly influence the outcome. The current level of scientific and technological development allows for the creation of modern comprehensive technologies that combine achievements from various technical fields.

**Conclusion.** Thus, in conclusion, it is worth noting that the institution of intellectual property has a special character, as intellectual property is not a form of tangible property rights and cannot be regulated

by the same methods as tangible property rights. Therefore, this institution requires different, specific norms and rules for its protection, as it needs to be protected just as thoroughly.

Intellectual property in Ukraine has a fairly developed structure, a large list of objects of intellectual activity, and correspondingly well-developed legislation concerning the protection and enforcement of intellectual property.

To summarize, it should be acknowledged that the active development of the legislative framework in the regulation of the digital economy and digital technologies requires significant intellectual efforts, which must be promptly employed to stimulate the practical utilization of the advantages and exploration of the possibilities of digital technologies in the modern Ukrainian digital economy.

Improving legislation on innovative activities and intellectual property is a measure to enhance the efficiency of the national economy.

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## **ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ ДЛЯ ЗАБЕЗПЕЧЕННЯ ЗАХИСТУ ПРАВА ІНТЕЛЕКТУАЛЬНОЇ ВЛАСНОСТІ: АДМІНІСТРАТИВНО-ПРАВОВІ АСПЕКТИ**

Комплексно досліджено технології, покликані здійснювати захист прав інтелектуальної власності. Проаналізовано наукознавче підґрунтя дослідження інформаційних технологій для забезпечення захисту права інтелектуальної власності.

Акцентовано на тісному зв'язку розвитку інформаційних технологій і викликів для захисту інтелектуальної власності, розглянуто цю проблематику в контексті адміністративно-правових аспектів забезпечення такого захисту. Сформульовано пропозиції, спрямовані на удосконалення адміністративно-правових актів у досліджуваній сфері.

Проаналізовано тенденції розвитку права інтелектуальної власності та виявлено низку напрямів її подальшого розвитку, що виражаються в процесах глобалізації законодавства, переході від охорони зафіксованих на матеріальних носіях прав до захисту інформації. Наголошено на тому, що передавання (трансфер) сучасних технологій є одним із головних напрямів створення і використання інтелектуальної власності, що передбачено і в міжнародно-правових актах.

Стимулювання створення принципово нових технологій і розробок, їх широке промислове використання багато в чому залежать від системного підходу до структурування стратегії розвитку національної інноваційної системи, яка об'єднує фундаментальні наукові дослідження та залучення в економічний обіг (комерціалізацію) їх результатів, використовуючи правовий механізм обігу майнових прав на об'єкти інтелектуальної власності.

Особливу увагу звернено на правовий режим захисту блокчейну, зокрема на складність правової охорони блокчейну, який складається як з інформації, так і з об'єктів інтелектуальної власності. Вказано, що цей об'єкт є системою запису, зберігання та опрацювання інформації та технологією виконання дій у цифровому середовищі. Доведено, що блокчейн є цінністю, пов'язаною із об'єктами з ексклюзивними правами, і має можливість виставляти рахунки. Наголошено, що блокчейн можна розглядати в межах Закону про інформацію як інформаційний продукт у формі документа, який містить інформацію.

Ключові слова: інтелектуальна власність; інноваційна діяльність; адміністративно-правове регулювання; захист інтелектуальної власності; інформаційні технології; блокчейн; адміністративна відповідальність.