



RESEARCH ARTICLE

Legal Mechanisms for Intellectual Property Protection in the Digital Environment of E-Commerce

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ABSTRACT

Intellectual property created through digital technologies plays a crucial role in the economy, serving as a vital tool for developing the domestic market. Therefore, it is essential to ensure adequate protection of intellectual property rights in the sphere of digital technologies and electronic commerce. This research aims to analyse the legal regulation of intellectual property protection in digital technologies for electronic commerce. The following methods were used: formal-legal, comparative-legal, formal-logical, analysis and synthesis, dialectical, and functional-instrumental. The article identifies the peculiarities of conducting electronic commerce in Ukraine. This text discusses the determination of intellectual property objects in digital e-commerce technologies and common violations in this area. It highlights the need for comprehensive legal norms to prevent violations and compensate for damages. Additionally, the text examines the problems through which violations of intellectual property rights often occur and studies the American and European models of intellectual property protection. Civil law instruments protect intellectual property rights in digital technologies and e-commerce. The text outlines the importance of protecting intellectual property as a foundation for innovation and proposes practical tools for protecting rights in this sphere. It is important to note that the development of e-commerce presents advantages and challenges that impact the regulation of this market's growth and innovation. This is due, in part, to violations of legal property rights.

INTRODUCTION

The era of digital technologies continues to transform society and the economy, presenting a rather complex task for the state associated with adapting existing legal instruments to the new segment in regulating this activity. The digital technology industry is rapidly advancing to leading economic positions, particularly in e-commerce. The creation and implementation of new intellectual property objects are affected by the need for specific mechanisms to ensure legal protection. This is due to the numerous opportunities in the digital sphere that may result in violations of the rights of individuals or legal entities to intellectual property results.

Effective means of protecting intellectual property in digital technologies of e-commerce and restoration in case of infringement are crucial for realising the owner's subjective right. Proper rights protection is complex, particularly regarding copyright content, unlawful copying, and patenting

digital objects. It is essential to acknowledge that with a proper regulatory framework to safeguard the rights of intellectual property owners, the advancement of digital technologies may be improved.

The purpose of the study is to examine the legal regulation of protection and problems of improving intellectual property in digital e-commerce technologies.

Research objectives:

- To identify intellectual property objects in the field of digital e-commerce technologies that are not legally protected;
- To analyze the types of infringements of intellectual property rights in the field of digital e-commerce technologies;
- To study the instruments of legal protection of the objects of research;
- To determine the directions for improving the protection of intellectual property rights in digital e-commerce technologies.

LITERATURE REVIEW

The rapid development of digital technologies in recent years has significantly expanded the spheres of influence in societal processes. Advancements in this field greatly enhance productivity levels, shape new business models, and improve interactions among specific entities. The issue of intellectual property protection in the context of digital technologies has been explored by both domestic and foreign scholars, including fundamental works by A. Aksyutina, M. Vikhliaiev, D. Zhuravlov, O. Kulinich, A. Lomakina, L. Mezhevskaya, O. Nestertsova-Sobakar, R. Pichko, L. Romanadze, A. Khridochkyn, K. Chyzhmar, P. Tsybulov, T. Yaroshevskaya, S. Baron, C. Keswani, E. Lamoureux, C. Stewart, and others.

In order to enhance entrepreneurial opportunities in modern conditions, it is necessary to utilise the achievements of digital technologies actively. As noted by Kraus et al. (2019), considering the wide range of possibilities offered by digital technologies, Ritter & Pedersen (2020) and Keswani (2022) emphasise that the use of electronic commerce (e-commerce) is a relevant advantage for business development and innovation. Understanding e-commerce, as characterised by Faccia et al. (2023), involves considering it as a specific technology that facilitates the corresponding algorithm of business operations, realised through ordering objects (goods/services) and processing payments digitally. As indicated by Ahi et al. (2023), the opportunities of e-commerce represent potential business advantages, transforming the entrepreneurial landscape overall and necessitating support for these changes through the appropriate legal framework.

However, concerns arise regarding protecting owners' intellectual property rights in digital electronic commerce technologies. This is a restraining and inhibiting risk factor for developing innovative digital technologies. This viewpoint is expressed in the research by Clegg (2019). Processes such as copying, counterfeiting, and borrowing intellectual property objects from their rights holders without proper permission for their use (Chen, 2022; Awashreh et al., 2024) have gained significant prevalence in modern realities. Therefore, ineffective, loophole-ridden regulatory acts in the investigated issue increase the risks for e-commerce and economic activities (Jean & Tan, 2019; Qadir et al., 2024).

According to Romanyuk (2020), digital technologies have created advantages for businesses and opportunities for dishonest individuals, such as a platform for selling counterfeit goods, mainly by providing tools to operate anonymously online. Thus, Shmatkov (2023) emphasises in his research the necessity of establishing an effective infrastructure system in the country to ensure analysis and tracking of the legality of using relevant intellectual property objects in the digital sphere of e-commerce.

In today's conditions, there is a demand from entrepreneurs for effective measures in case there is a need to develop and implement new legal protection tools, which would allow them to, firstly, prevent violations of their rights in the intellectual sphere, and secondly, stop such violations by demanding compensation for the damage caused. Therefore, the issue of legal protection of intellectual property in digital technologies of electronic commerce requires further investigation.

RESEARCH METHODS

The following materials were used for the study: 1) legal acts regulating the protection of intellectual property rights and transactions in the field of e-commerce; 2) scientific and practical works of domestic and foreign authors who study the issues of intellectual property protection in digital e-commerce technologies.

The following methods were used in the course of the study: formal legal and comparative legal methods, which made it possible to analyse national and international legislation in the area of intellectual property protection; the formal logical method was applied to clarify the content of legal provisions and analyse the instruments provided for the protection of intellectual property rights; the functional and instrumental method provided for the identification of the peculiarities of ensuring the protection under study; the dialectical method contributed to the study of legal support for the protection of intellectual property rights.

RESULTS

In the era of the Fourth Industrial Revolution, the development of e-commerce has led to the proliferation of sales of goods/services on digital platforms. According to the Statistical Portal for Market Data (<http://statista.com>), it is estimated that there will be 18.5 million users in the global e-commerce market by 2028 (eCommerce – Ukraine, 2024). Therefore, the expansion of e-commerce tools is attracting more and more entrepreneurs every year who wish to carry out their activities through these information platforms, offering consumers the opportunity to participate in specific business transactions in a short period, namely 1) familiarise themselves with the offer, the terms of the purchase contract; 2) conclude the contract; 3) pay for the goods/services ordered. Thus, it is understood that legal transactions are carried out by exchanging data on e-commerce platforms regulated in Ukraine by the provisions of the Civil Code of Ukraine and the Law of Ukraine “On e-commerce” (2015).

The Ukrainian law on e-commerce (2015) states that an electronic legal transaction refers to an action carried out through an information and communication technology system to acquire, modify, or terminate the associated civil rights. Therefore, domestic legislation provides the required legal framework for developing e-commerce in the context of digital technologies. However, the direct application of e-commerce capabilities in people's everyday lives should be understood as activities related to the execution of legal transactions. These transactions involve implementing certain products (goods/services) through electronic (digital) means. It should be noted that the seller is the obligatory party in these legal relationships, and they must have the status of a natural person entrepreneur or a relevant type of company.

In this research, we define intellectual property objects in the sphere of digital technologies for electronic commerce (Figure 1).

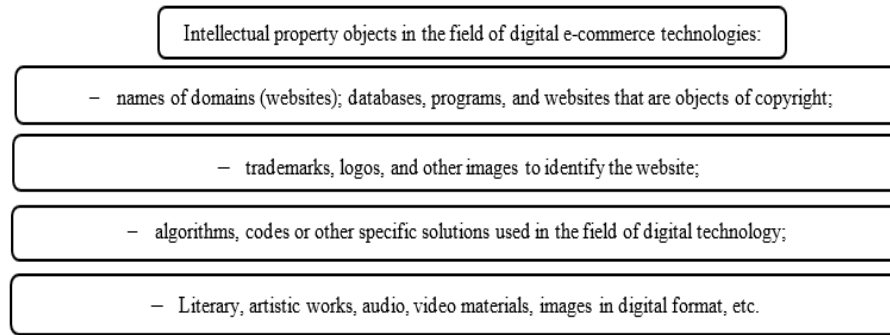


Figure 1: Intellectual Property Objects in the Field of Digital E-Commerce Technologies

Source: compiled by the author

Among the digital intellectual property rights objects on e-commerce platforms that are subject to infringement, the most common are the following:

- 1) Plagiarism: copying video, audio, visual and/or textual content with subsequent placement under one's identification;
- 2) Distribution of a trademark image without permission: the unlawfulness of this activity consists in the use of the brand image of another trademark owner by placing it on the Internet on web pages to sell under this brand;
- 3) Formulation of domain names: formulation of the domain name from similar signs or consonant letters, which allows the identification of the source for copying;
- 4) Creating a copy of the object of protection: registration of a "twin" of a particular web platform implies the commission of unlawful acts of copying key elements, textual, visual, audio and video content; reproduction of the product that was copied (processed, modified, adapted, etc.).

It is important to note that without legal mechanisms to protect intellectual property rights in digital technologies for electronic commerce, rights holders cannot use legal instruments to prevent infringements and seek compensation for damages. According to the European Union Directive of April 29, 2004 (Directives of the European Union "On the enforcement of intellectual property rights", 2004), countries must take adequate measures to protect intellectual property rights and punish violators. Therefore, providing a minimum set of legal instruments to protect intellectual property rights from infringements is necessary.

In the context of the research, it is essential to classify infringements of intellectual property rights into types: a) direct infringement, where entrepreneurs place the objects of intellectual property subject to the dispute on their website (most often copying or counterfeiting (using someone else's trademark) of intellectual property objects in the field of digital technologies); b) intermediary services of e-commerce platforms in the placement of product/service cards, providing only the opportunity for such placement online (usually unintentionally). Concerning this option, there may be cases when third parties place information content on web portals without indicating the owner or without the owner's consent (Vorobiova et al., 2023). At the same time, the website owner on which such infringing information is placed is responsible for its placement (Singh, 2021), since the infringer was given permission to place the information without proper monitoring of his actions, which led to the infringement.

Let us identify the most common problems that lead to violations of the investigated rights. Information and telecommunications technologies have made copying and distributing objects easy without notifying or compensating the rights holder. Uploading product or service cards to the Internet is also quick and easy. Additionally, web platforms can be registered outside the country where goods or services are sold, and businesses can operate without establishing a physical presence. The evidential basis for tracing the process from product creation to sale becomes complicated due to specialised components such as data exchange speed and website/page saturation. Additionally, the absence of a state mechanism and legal liability for e-commerce entities further complicates the matter regarding facilitating the posting of information about products/services that infringe the intellectual property rights of others.

According to the judicial practice of the European Union, e-commerce portal owners are only minimally involved in disputes related to intellectual property infringement. This is the case when they perform technical and/or automated tasks in a passive role and lack knowledge about the content of the information being hosted or transferred on the electronic resource (Pirola et al., 2020).

To determine the appropriate strategy for protecting violated rights, it is necessary first to establish the relevant right to a specific object. This can be achieved by obtaining the necessary documents to prove the right. Continuous legal protection involves documenting digital objects, which can be achieved through obtaining a patent for an invention (used for website functioning), industrial design registration (website design), domain registration (website) as a trademark, and registration of website codes. However, according to Chatterjee (2023), these objects often need to be registered, requiring the compilation of alternative evidence.

Developing effective legal instruments to protect intellectual property rights in the field of digital technologies is a priority for any country's strategic development worldwide. Modern trends aim to digitalise all societal processes (Gupta et al., 2023; Margaretha et al., 2023). Although the protection of these rights varies across countries, the global community is moving towards establishing standard legal norms to address this complex issue.

The state has implemented a system to protect intellectual property rights, which includes legislative acts, mechanisms, and infrastructure for their implementation. As stated by Makedon et al. (2022), these rights are protected following the law, using appropriate forms and methods. Chen (2022) argues that the widespread development of technologies such as databases, computer programs, websites, software, search engines, e-shops, e-libraries, e-commerce, digital autographs and electronic publications determines the objects of digital communication. It is important to note that these objects are subject to specific legal regulations. They represent a particular way of presenting content on digital elements such as web pages, websites, and web portals.

Yaroshevska et al. (2022) indicate that modern intellectual property theory is divided into American (intellectual property legislation reinforced by a patent mechanism) and European (exclusively legal framework in the field of intellectual property) models of providing legal protection for digital objects. It is important to note that the actual legal situation is such that intellectual property law protects computer programs, databases, and software code, but the principles, ideas, and developments on which the corresponding object is based. Other components of its content are not legally protected. The application of patent protection involves protecting the critical idea of the developed program and the algorithm of its operation; however, the tool of violation in such a case is not directly defined. As known from the American experience, the registration of patents for relevant software is susceptible to the influence of significant business structures interested in this segment; hence, it is understandable that this is a lengthy, costly process of obtaining patent protection and compliance with stringent conditions.

Thus, legal forms of protection for intellectual property rights are implemented through civil, administrative, and criminal means following international, mainly European standards. The provisions of civil law include instruments, as shown in Figure 2.

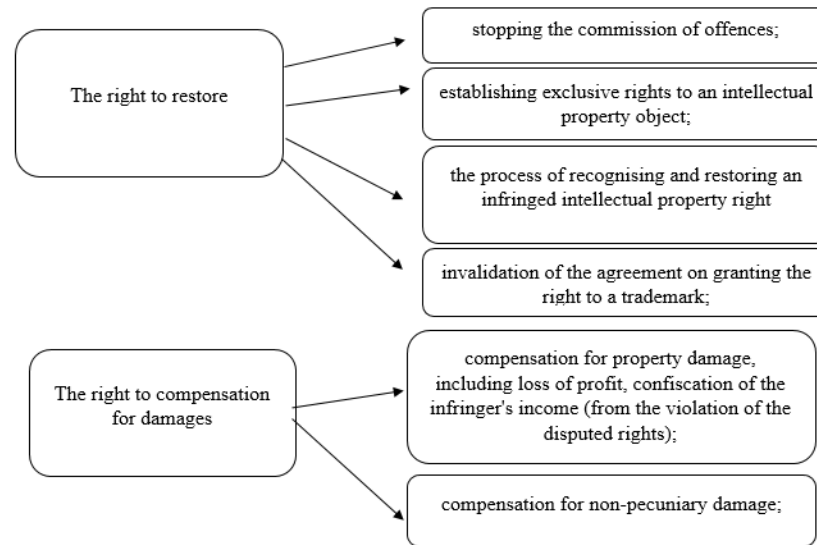


Figure 2: Civil Law Instruments for Ensuring the Protection of Intellectual Property Rights in the Field of Digital E-Commerce Technologies

Source: compiled by the author

It is established that legal protection of intellectual property rights may extend to individual components, such as visual works, audio materials, video materials, program text, source code, etc., and the object, such as a website. The regulation of these objects is determined by their digital format of existence and their rapid dissemination on the Internet (Aleinikova et al., 2023). Thus, violations of intellectual property rights in e-commerce can occur under the following circumstances:

- a) Difficulty in defining a specific problem for formulating methods and means of protecting infringed rights online;
- b) Lengthy and complex process of registering intellectual property rights;
- c) Unlawful use of trademarks in domain names;
- d) Lack of quality legal practice on the investigated issue.

It is worth noting that intellectual property rights are usually protected through civil law norms. These norms establish the right to restore the infringed right and provide compensation for damages suffered. Therefore, holding the infringer accountable in civil proceedings involves the copyright holder appealing to judicial authorities. Article 16 of the Civil Code of Ukraine (Law of Ukraine Civil Code of Ukraine, 2003) sets out the methods for protecting the rights and interests of individuals through legal or contractual means. Additionally, Article 432 of the Civil Code of Ukraine (Law of Ukraine Civil Code of Ukraine, 2003) specifies that intellectual property rights are protected through judicial procedures. The following Ukrainian laws are highlighted as critical legislative acts that ensure the protection of intellectual property rights:

- 1) "On Copyright and Related Rights" (Law of Ukraine on Copyright and Related Rights, 2022);

- 2) “On the Protection of Rights to Inventions and Utility Models” (Law of Ukraine on Protection of Rights to Inventions and Utility Models, 1993);
- 3) “On the Protection of Rights to Industrial Designs” (1993), Law of Ukraine On Protection of Rights to Industrial Designs (1993), Law of Ukraine On the Protection of Rights to Signs for Goods and Services (1993), Law of Ukraine On Protection from Unfair Competition (1996), etc.

It is essential to consider that the initial step in protecting the rights being investigated involves the copyright holder contacting the website owner where the infringement is found. The copyright holder should send a complaint requesting the removal of the disputed material from the site. This is a common practice among e-commerce platforms. In cases of website owner dishonesty, this option may not be available. In such cases, the copyright holder must contact the financial service provider and the relevant internet service provider to report the identified infringement through specific websites. However, in more complex cases, these actions may need to be revised to protect the right adequately and may necessitate applying more effective measures.

The European Union's experience is noteworthy in recommending that e-commerce intermediaries take active measures to combat intellectual property rights violations. This includes the implementation of automated programs to identify and investigate issues. It is essential to comprehensively apply existing tools for protecting intellectual rights in the field of digital technologies in Ukraine (Osetskyi & Marchuk, 2022). This includes measures to counteract the unlawful dissemination of intellectual property rights, such as fixing watermarks, data encryption, and access control.

The elements above aim to minimise violations of intellectual property rights in digital technologies and provide preliminary protection against such violations at the pre-trial stage. However, owners of e-commerce resources should consider the risks and implement effective systems to check for infringements of intellectual property rights. This is evidenced by occasional cases of spreading objects that violate the investigated right on their electronic resources. Examples of electronic infringement detection systems include technical programs that identify and block competitors who copy or use a trademark or other object registered by another owner. Some examples of these programs are Project Zero, BrendRegistry, and Transparency on Amazon; VeRO on eBay; and the Etsy Reporting Portal on Etsy (Keswani, 2022). It is understandable that large e-commerce platforms are concerned about their reputation and, therefore, make significant efforts to protect intellectual property rights.

DISCUSSION

An essential issue for ensuring the protection of the investigated rights is the application of a reliable mechanism for identifying entities on digital e-commerce platforms (conducting transactions). It is due to the technical possibility of committing intellectual property infringements in an anonymous mode (Strelnyk et al., 2023), facilitated by the use of unreliable information about the subject's location and other factors, which complicates the process of ensuring the protection of infringed rights. Therefore, to address this issue, it is advisable to implement a biometric identification system, which contributes to the detection and establishment of the relevant characteristics of the subject.

Measures to counter violations should have strict boundaries of protection that restrict access to innovation and essential information (Hemmerling & Hofer, 2022). Practical tools must be developed and implemented to ensure the legal protection of rights holders through programmatic measures that uphold the principles of fair competition and stimulate innovation. Discussing property rights infringements, such as copying visual, audio, video, textual content, software, and websites, is necessary. Among the aspects above, countering the investigated infringements at the international level is particularly important due to the borderless nature of activity in digital technologies. The

described measures comply with the requirements of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), expanding opportunities for owners of relevant rights to protect against infringements.

CONCLUSION

In summarising the above, it is noted that the legal aspects of intellectual property protection in the digital sphere of electronic commerce represent a broad field of study, including current challenges such as copyright abuse, trademark and patent infringements, piracy, etc. It has been established that ensuring the protection of the researched issue involves certain legal aspects:

- 1) Copyright is aimed at protecting creative activities carried out through websites, software creation, etc.;
- 2) Trademark registration protects the logo, identification marks of the entrepreneur, names of goods/services;
- 3) Patenting involves protecting new technologies, innovations, methods of conducting business processes;
- 4) Ensuring the protection of confidential information (non-disclosure agreements) and personal data of parties in the e-commerce sphere. Thus, the identified legal aspects of intellectual property protection in digital technologies in e-commerce serve as a foundation for prospective development and implementation of innovation and gaining competitive advantage.

It has been elucidated that practical tools for ensuring intellectual property protection in the researched sphere will come into effect:

- 1) Through the formation of a solid legal framework for regulating the social relations existing in the specified sphere;
- 2) Ensuring apparent compliance with legal norms;
- 3) Development and implementation of measures to hold violators accountable;
- 4) Implementation of digital programs, the functioning of which includes tracking (detection and blocking) competitors who copy or use a trademark or other object registered by another owner.

The conducted research has only underscored the importance and depth of the existing advantages in applying digital technologies in the e-commerce sphere and, accordingly, vectors for improving the protection of intellectual property rights. The results have shown that the development of e-commerce provides both advantages and challenges that impact the restraint of market development and innovation development due to infringements of owners' intellectual property rights.

In the perspective of further scientific developments, the study envisions exploring the best international practices in the researched sphere.

AUTHOR CONTRIBUTIONS

V. V.: Conceptualization, Methodology, Resources, Formal analysis, Data Curation, Project administration, Writing – Original draft, Writing – Review & Editing.

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