

LEGAL NATURE AND INHERITANCE OF VIRTUAL PROPERTY IN UKRAINE AND THE WORLD: CURRENT STATUS, PROBLEMS, PROSPECTS

NATURALEZA JURÍDICA Y HERENCIA DE LA PROPIEDAD VIRTUAL EN UCRAÑA Y EL MUNDO: SITUACIÓN ACTUAL, PROBLEMAS, PERSPECTIVAS

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Abstract: In recent years, there has been a growing interest in such a phenomenon as a digital inheritance. Sooner or later, users of social networks or online games begin to think about the status of their virtual assets, as they become valuable since users have spent a lot of time to earn them. However, legislation on digital inheritance remains either imperfect or does not answer the question of what happens to digital property after one's death. The study aimed to describe the situation in the field of digital inheritance through the concepts of virtual property and IT objects. We used systemic, formal-legal, and hermeneutic methods to describe the state of the art in the area of virtual property and digital inheritance through the lens of jurisprudence. The found results suggest that digital inheritance is a growing problem due to imperfect or absent legislation with simultaneously

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increasing role and importance of the virtual world and digital assets in everyday life. Accordingly, we have found that court decisions set the tone for the development of the legislative process in this field, but at the moment, we are only at the beginning of the creation of solid and harmonized legislation towards digital inheritance. It is also determined that the concept of virtual property does not contradict the general principles of civil law, so it can be applied in the context of digital inheritance.

Keywords: Virtual Property, IT Objects, Digital Inheritance, Social Networks, Online Games

Resumen: *Durante los últimos años ha crecido el interés en la herencia digital. Tarde o temprano, los usuarios de redes sociales o juegos en línea comienzan a pensar en el estado de sus activos virtuales, sobre todo cuando adquieren un gran valor luego de que los usuarios hayan dedicado mucho tiempo a ganarlos. Sin embargo, la legislación sobre herencia digital sigue siendo imperfecta o no responde a la pregunta de qué sucede con la propiedad digital después de la muerte. El estudio tuvo como objetivo describir la situación en el campo de la herencia digital a través de los conceptos de propiedad virtual y objetos informáticos. En particular, este estudio utiliza métodos sistémicos, formal-legales y hermenéuticos para describir el estado del arte en el área de la propiedad virtual y la herencia digital a través de la lente de la jurisprudencia. Los resultados encontrados sugieren que la herencia digital es un problema creciente debido a una legislación imperfecta o ausente, que no concuerda con el papel y la importancia del actual mundo virtual y de los activos digitales ahí generados. Se ha constatado que las decisiones judiciales marcan la pauta para el desarrollo del proceso legislativo en este campo, aunque por el momento solo estamos en el comienzo de la creación de una legislación sólida y armonizada hacia la herencia digital. También se determina que el concepto de propiedad virtual no contradice los principios generales del derecho civil, que se pueden aplicar en el contexto de la herencia digital.*

Palabras clave: *Propiedad virtual, objetos de tecnologías de la información, patrimonio digital, redes sociales, juegos en línea*

Summary. *I. Introduction. II. Methodology. III. Analysis of recent research. Iv. Results and Discussion. III.1. Legal Nature and Inheritance of IT Objects and Virtual Property. III.2. National Legislation of Ukraine on Virtual Property and Digital Inheritance. III.3. International Experience of Legal Regulation of Digital Inheritance and Virtual Property. V. Conclusions. References.*

I. INTRODUCTION

The information sphere of human life is currently the subject of serious scientific research (Brikše, 2003; Buder & Hesse, 2017; Skoryk, 2018). In this space, we can distinguish a specific product—information, that is becoming increasingly important, so the information environment is on a par with the social, environmental, etc. (Durante, 2017; Greif, 2017). In turn, researchers name, among others, the digital environment, which gives new meaning to intellectual property rights (Savych, 2015). In addition, the digital environment in the context of intellectual property is mentioned in the Recommendations for Internet Service Providers approved by the State Intellectual Property Service of Ukraine. At the same time, the digital policy has become a common direction of socio-economic development for countries such as Germany, France, and Sweden (Sokolova, 2018; Levytska, 2019).

Digital technology has become an integral part of our life. Of the 7.75 billion people living on Earth, 5.19 billion are smartphone users (Deyan, 2020). In 2020, the share of unique Internet users amounted to 4.2 billion people. We spend an average of 3 hours and 40 minutes a day on online activity. The average rate of any interactions with a smartphone reaches 2617 times a day, which for active users is 5427 times (Henderson, 2020). On average, 28 minutes a day are spent by users on the social network Instagram, according to data for 2020 (Deyan, 2020). The total number of users of this social network exceeded 1 billion in 2020. The use of social networks also varies by region of the world. South Americans spend the most time online—3 hours 29 minutes a day. Next are the Africans, the population of North America, Asia, and Europe, whose residents spend an average of 1 hour and 53 minutes on social networks (Whatagraph, 2020). And even though there are suspicions that such trends will intensify (for example, concerning the so-called Generation Z (Gen Z), since they sometimes criticize and leave social networks) (Broadband Search, n.d.; Origin, Hill Holliday, n.d.), at the moment, the use of digital communication technologies is at its peak (Broadband Search, n.d.; Deyan, 2020; Henderson, 2020; Metev, 2021).

Technological development continues its victorious course in the field of social communications. According to Facebook CEO Mark Zuckerberg, VR and AR (virtual and augmented reality) technologies are designed to be at the forefront of progress this decade (Feuer, 2021). It is known, that

currently one-fifth of Facebook employees are actively involved in the development of these technologies (Robertson, 2021).

Selling goods has become the principal business model of virtual worlds in online games. This provides a connection between the analog and digital worlds (Abramovitch, 2009).

The revenue of the online gaming industry is growing (Jones, 2020). In 2019, the volume of online games on the mobile platform was 45% of the total, and their total revenue was 68.5 billion dollars. The total revenue of the online gaming industry, which also consists of games for PCs and consoles, in 2019 amounted to 152.1 billion dollars. Experts expect that it will grow to 196 billion dollars in 2022. The eSports segment is also growing (Reyes, 2021). Its revenues grow to 1.5 billion dollars in 2020. Such trends are ensured by the popularization of the culture of online gaming and a high degree of inclusiveness of players because it is possible to join the game with anyone from anywhere in the world, having sufficient novelty smartphones and access to high-speed Internet.

At the time of writing, there is a real boom in digital art related to the sale of virtual lots at auctions. Buyers of such items can place them in a virtual gallery or sell them if their price rises. Blockchain technology clearly establishes a chain of ownership that eliminates the counterfeiting of such objects and helps to establish the original owner (Finzer, 2020). It is called a non-fungible token (NFT), *i.e.*, a representative virtual object (Clark, 2021), or digital certificates based on blockchain technology, which correspond to digital objects of virtual property. For example, the online platform Valuables allows users to obtain certificates of ownership of digital objects. Their purchase is made possible by an application that is downloaded for the browser and is analogous to the digital wallet for the cryptocurrency Ethereum—thus buying and selling (Fairs, 2020; Finzer, 2020). This technology has already been used by some artists to make a profit. For example, at Nifty Gateway, digital art author Alexis Christodoulou sold his virtual design for 340,000 dollars, and Beeple's digital painting "Everydays: The First 5000 Days", which is nothing more than a JPEG image, was sold at Christie's. for a record 69 million dollars (Hahn, 2021cd). You can also add the release of fully digital shoes, which can be "worn" only online, using extensions (applications) of virtual or augmented reality (VR, AR). For example, such campaigns were recently conducted by the Gucci and Buffalo London brands (Hahn, 2021ae). It is known that on March 22, 2021, a digital house was sold for the first time, which can only exist in VR. The author was an artist from Toronto named Krista Kim, and the price of the lot was 512,000 dollars (Parkes, 2021). Prior to that, Argentine Andres Reisinger sold 10 virtual hardware items at an

online auction for 450,000 dollars (Hahn, 2021b). NFT's Gold Rush has not escaped the realm of entertainment and has even touched tweets, which can now also be sold for digital currency (Knibbs, 2021). In particular, one of the founders of the social network Twitter did it for 2.9 million dollars, and the singer Grimes sold digital copies of her music and videos for 6 million dollars (Kastrenakes, 2021; Peters, 2021). However, it cannot be said that this phenomenon appeared only in 2021. For example, two years ago, the virtual dress Iridescence of the digital fashion house The Fabricant was sold at auction for 9,500 dollars (Fairs, 2020). Consider, from another point of view, the problem facing us on the scale of democratic institutions, mechanisms of checks and balances. As multinational companies that own social networks accumulate information about their users, it can be said that they accumulate more power in their hands because the information provided by users has economic value (Zimmer, 2008; Bauman & Lyon, 2012; Ball *et al.*, 2012). But its value goes beyond mere benefit as it can be intangible. We summarize that by becoming a user of a particular social network, users consciously provide access to their data since they agree to the terms of use of the service and their activity is implicit concerning the terms of the contract of use (Oosthuizen, 2012). Could this be a sufficient justification for the accumulation of power in the hands of IT giants? A positive answer to this question can be assumed only if the contract does not find contradictory clauses that are contrary to the principles on which the law is based. In this case, the powers of the judiciary include reviewing the terms of the contract, and, in the future, the parliament will be obliged to review the policy towards social networks, if the conditions of their use may contradict the general principles of law. This is a desirable regulatory mechanism rather than an actual one, although parliamentary hearings on Google and Facebook have taken place in the US Congress (Canales, 2021), and there is constant talk of "shredding" these corporations (Danylenko, n.d.; Galloway, 2017; Moore & Tambini, 2018). In their conditions of use of the social network, they state that they obey the law, leaving democratic institutions the right to make decisions about their future.

Thus, it can be predicted that in the near future (during this or the next decade), the question of the legal status of IT objects will become acute. The following factors can be cited to substantiate this thesis. First, it is related to the process of innovation in the field of VR and AR. This will be a prerequisite for considering the legal status of virtual objects from a legal point of view. Second, the commercialization of the IT-sector, namely VR and AR technology products, such as Facebook or Google, will only increase the urgency of the problem, forcing it to be resolved legally.

Thus, for jurisprudence, the scope of the above facts is a question that can be formulated as follows: what is the legal status of these virtual objects, what rights and obligations will arise, for example, in their purchase and sale, and in general: what model of legal regulation is suitable or may be created in the future to regulate the field of virtual reality and so-called IT objects (digital objects, virtual objects, intangible assets). In the future, there is also the issue of their inheritance, which is still insufficiently regulated in the laws of many countries. All this puts before legal science the task of responding to the challenges of the future, which is already on the threshold.

II. METHODOLOGY

The application of the systemic method made it possible to link all the facts and consider them together as a systemic problem of digital inheritance, which is present as part of an array of other civil law problems. We utilized a systemic method to demonstrate that digital inheritance is not an isolated issue but also related to ethical problems, privacy issues, civil law, inheritance law, and human rights in general. With the help of the systemic method, we showed the contact of such areas of law as property rights, intellectual property rights, and what place virtual property occupies in this system. Additionally, using this method, it was demonstrated how inheritance law and digital inheritance are interconnected, and what legal norms are applicable for digital inheritance. For example, a systematic review of property rights in Ukraine shows that digital objects can be subject to the legal regime of property since they fit into the concept of the property despite their intangible existence. Another example of systemic method application is the description of the effect the judicial practice has on the inheritance law, particularly in the USA and Germany.

Further, the formal-legal method was implemented to characterize the rules of law from a legislative point of view. This is especially relevant in the sections on Ukrainian and international examples towards digital inheritance.

The hermeneutic method was used to interpret the decisions of case law and to demonstrate their future significance. For instance, it occurs in the section on international experience regarding the decision of the German federal court. We also used a hermeneutic method in the introduction to demonstrate how changes in IT and virtual property affect our understanding of digital inheritance. Consequently, we interpreted data from various spheres of human life, for example, concerning online auctions that conduct

sales in cryptocurrency, the emerging market for online games, and even data from the eSports field.

Besides, the method of analysis was used in the decomposition of the concept into its main features. For example, it is applied to perform a structural analysis of the concept of virtual property. It was essential for us to understand what the main features of this concept are, and which are additional, concomitant, and optional. Finally, the results are evaluated obtained synthetically.

III. ANALYSIS OF RECENT RESEARCH

The history of the study of the concept of virtual property can be explored by considering the experience of Castronova (2001). In this paper, the author drew attention to online games and domestic currency, which (in one of the games) exceeded the value of real foreign currencies. Nelson (2009) later found that in the famous game World of Warcraft, the game account cost 717 dollars (as of the time he wrote his study), which drew attention to further developments in this area since the economic value of virtual worlds.

Fairfield (2005) was one of the first to state that the separation of legal regimes of virtual and intellectual property is necessary. The author notes that much of what we call virtual is created in the likeness of the real world. Therefore, the researcher concludes, similar legal instruments of regulation should be applied. Since, in the real world, there are legal regimes of ownership (for example, property rights) and intellectual property rights, the same scheme should exist for virtual worlds. The intellectual property rights to the program code remains with the developer.

In his article, Nelson (2009) opposed the extension of users' rights to virtual world objects. He noted that the development of the final product is a complex technological process that requires significant resources, time, and investment, so restricting the rights of content owners in this way would be unfair.

In Gong's study (2011), the virtual property appears as a category that includes intellectual property between avatars, domain names, etc. The author thus refutes the view of their distinction as two different categories in the context of our study.

Cifrino (2014), in his study, advocates the solution of problems in the field of virtual worlds based on contract law. The author notes that modernized regulation based on the End User License Agreement (EULA) should fairly reflect the balance of interests between users and developers.

Thus, he notes, the unilaterality of licensing agreements is overcome, which otherwise contributes to the monopoly of developers. The author criticizes the idea of extending ownership to virtual worlds, noting that none of the doctrinal approaches to the concept of property such as the Lockean theory of labor, utilitarianism, etc. cannot fully reflect the specifics of regulating virtual worlds, therefore, only EULA-based contract law regulation can do that.

Nekit (2019) explored the civil law nature of the virtual property. In particular, the legal nature and content of virtual property rights were described, according to which it is determined that it is the right of ownership of a disembodied thing or an intangible object, therefore, in the future it should be subject to the regime of property rights. The possibility of using virtual property in the legislation of Ukraine, as well as international experience in this context, were also analyzed.

Alina (2020) described the inheritance of IT objects in her thesis. According to her definition, traditional legal regimes cannot be applied to IT objects. The definition of this concept is given through a set of features, which include: (i) predominantly intangible form of existence; (ii) creation with the help of information technologies; and (iii) the exercise of rights to them is carried out by subjects of civil law.

IT objects do not need analogs in reality and can be reproduced only with the help of appropriate technical means.

For the researcher, the fundamental demarcation between IT objects and virtual objects is that the former are part of the so-called “IT ecosystems” that include physical things such as digital media, such as computers, laptops, tablets, smartphones, and more. At the same time, virtual objects have no and do not need analogues in physical reality, they are a value, they exist as a part of the virtual space, which is accessed through software (existence through computer code). A similar difference between IT objects and virtual property can be found in thesis of Palka (2017). Both scholars agree that the object of virtual property is a virtual asset.

IV. RESULTS AND DISCUSSION

III.1. Legal Nature and Inheritance of IT Objects and Virtual Property

The main problem with the inheritance of digital property is the lack of its definition (Conway & Grattan, 2017). To analyze whether IT objects as digital “things” are ephemeral and volatile, it is necessary to refer to the civil law doctrine, which does not deny the plurality of civil rights objects (Alina, 2020). An approach to the definition of the object of subjective law, which is carried out through its definition as “good”, has been used.

Therefore, the objects of law are material and intangible goods, in respect of which there are relations between the subjects of civil law. Thus, the subject of civil law regulation is formed. For example, according to Art. 170 of the Civil Code of Ukraine, the objects of civil rights, in addition to things, money, and securities, are also information and other tangible and intangible goods.

Alina (2020) suggests that there is a point of view according to which virtual objects are special immaterial objects which are an intermediate link between the objects of intellectual property and classical objects of property rights (Duranske, 2008). Consequently, they do not belong to the latter as they exist only virtually likewise they do not belong to the former because in some cases they are not the subject of the creative work of the user (ibid). As arguments in favor of their position, proponents of extending property rights to virtual objects refer to the fact that such objects can be acquired and alienated and have a clear consumer value (Hunt, 2008; Lastowka & Hunter, 2017).

Since both legal regimes of intellectual property and property rights to disembodied things can be extended to virtual property it seems appropriate to investigate this problem independently at first as long as there is no consensus among both legislators and scholars. For instance, when a virtual property is not the subject of a user's creative work (for example, a Bitcoin), it is not subject to intellectual property rights. The need to allocate virtual property in a separate class of research is due primarily to the format of its existence, which is an immaterial existence in the digital (virtual) space.

The legal nature of virtual objects is different from the legal nature of things, due to the immateriality (incorporeality) of such objects and the peculiarities of the exercise of civil rights against them (Alina, 2020). Nowadays, virtual property means not only in-game objects and avatars, but also domain names, URLs, e-books, tickets, email accounts, social media accounts, websites, chats, bank accounts, cryptocurrencies, etc. (Fairfield, 2005; Palka, 2017). Although, it should be noted that if we are considering digital objects in the context of intellectual property rights then some sort of things cannot be inherited. For instance, according to Art. 423.4 of the Civil Code of Ukraine and Art. 14.2 of the Law of Ukraine "On Copyright and Related Rights" personal non-property rights of the author may not be transferred (alienated) to other persons. In addition, Art. 29 of the exact Law states that personal intangible rights of the author cannot be inherited. The heirs have the right to protect the authorship of the work and to oppose the distortion or other alteration of the work as well as any other encroachment on the work that may damage the honor and reputation of the author. The examples for that may be objects of digital art, e-books, websites, *i.e.* the results of author's creativity.

For example, according to Art. 8 of the Civil Code of Ukraine, civil relations not regulated by this Code are subject to regulation by analogy of law. Alina (2020) notes that the presence of such objects of civil law as honor, dignity, business reputation, information, other intangible goods (intangible rights) indicates the heterogeneity of the system of objects of civil law. This is a prerequisite for the allocation of such a class as virtual property. Simultaneously, the reduction of virtual property to goods or services, things, or information is a significant narrowing of this category. Virtual property in this context is, first, the elements of virtual space that do not have a similar material expression; secondly, they are of a certain value (aesthetic, cultural, informational, economic, etc.); thirdly, integrated into the corresponding virtual system, which is accessed by technical means using information technology. The combination of these features is the concept of virtual property in its legal scientific interpretation.

At the very moment, there is no single point of view in the scientific community regarding the ratio of virtual and intellectual property. It is noted that the legal regime of intellectual property in the context of digital objects tends to be confusing, so some difficulties for both lawyers and scholars are represented by the adequate demarcation between intellectual property and virtual property (Stephens, 2002; Nelmark, 2004; Hurter, 2009). For instance, concerning End User License Agreements there is a risk of disproportionate restriction of the user's virtual property rights by the content developers. An example is a prohibition to dispose of any game content in any form. One can argue that nothing is violated in this case as far as this is a contractual relationship, which means that the freedom of contract must be respected. The parties signed an agreement using the right to make an independent transaction, to choose conditions and a counterparty, which means that users themselves have signed these conditions and must comply with them. Therefore, content developers have all rights to put such restrictions in the agreement since they created the game and all in-game objects. Hence, the virtual property can be owned by the players only as of the right of paid or free use. However, there is another side to this story. Beyond the freedom of contract the question remains unresolved: are such terms of the agreement fair for both parties? We discuss this issue in more detail below.

To distinguish between virtual and intellectual property, a competitiveness criterion is introduced (Fairfield, 2005; Blazer, 2006), which refers to access to a property at a particular point in time. This concept is used in opposition to exclusive intellectual property rights. A typical example of the competitiveness of virtual property is access to a gaming account, which can be accessed by only one person, and all other people who

try to enter it will be blocked. Thus, a gaming account as a virtual property is competitive in this sense, as only one person has access. In contrast, the song in MP3 format can be listened to by many people. An example is music streaming services such as Apple Music, Spotify, YouTube Music, Deezer, etc. In this case, one song can be listened to by a lot of people simultaneously thereby gaining auditions and popularity, but the exclusive rights to it are protected by law.

In this context, Abramovitch (2009) proposes to solve the problem by distinguishing between three levels of virtual ownership. According to this concept, the first level is protected by intellectual property rights, because computer code, which is the nature of virtual reality, falls under its protection. On the second level, there are virtual analogues of real-world objects, for example, game goods (swords, spears, rings, balls, vehicles, etc.), tokens (valuable subjects), construction objects (houses, buildings, infrastructure), etc. On the third level, there are the so-called hybrids, which have their expression simultaneously in real and digital form. These can be virtual books, the content of which is the object of intellectual property rights, and the original is a physical thing that exists in reality; designer clothes that have a physical original and their virtual version. Thus, according to this concept of three levels of virtual ownership, the developer retains the rights to the created object as the object created its content, software, and the object of the virtual property is passed to the subject of ownership. Hence, a similar distinction is made between the right of (virtual) ownership (of disembodied things) and the right of intellectual property, as in the traditional concept of ownership between the right of ownership of material objects and the right of intellectual property.

The game developers can appeal to the fact that all in-game items are provided to the player based on the following principles:

- (i) on a paid or free basis;
- (ii) they are provided for use, *i.e.* developers reserve the right of ownership to these objects, because: a) they are the developers of the software based on which the “reality” of the game functions; thereby, b) everything in the game is subject to and belongs to their discretion, and the right to dispose of the in-game object or character remains with them;
- (ii) prohibition of access of third parties to the game account, which as a result of the paid receipt of the right to use was provided with game items or characters based on the contract of sale, the rules of the game, *i.e.* End User License Agreement.

The position of content owners is clear in this situation. They do not want the game items or characters to be passed from hand to hand on a paid basis while they have no benefit from these operations. On the other hand,

the ban on third-party access to the game account can be traced to the concern for the security of personal data of players, which is more of an advantage for them because by and large in addition to reputational losses the developer does not care from whom to receive money for game content (objects or characters) (Fairfield, 2005). In what position do players find themselves if they only receive game content for use on a paid basis? It turns out that according to the rules of the game which are set by the developer that players cannot transfer their account for use to third parties. They can't dispose of game content to third parties, although it still happens unofficially (Glasser, 2010; Lin & Sun, 2011; Felder, 2012; Lee *et al.*, 2018). Consequently, it is possible to trace the conflict of interests between game developers and players, which is to respect the intellectual property rights and mainly economic interests of the developer on the one hand and the interests of players who want to dispose of the game virtual property received on a paid basis and transfer it for use to other persons.

If we take a step forward and move into the general theoretical sphere, in this context, we can trace the worldview conflict between developers and players. Its main features can be formulated as a confrontation between freedom of contract and personal non-property rights. The argument on the part of game developers here will be that the players voluntarily agreed to the terms of use. Since no one forced them to download and participate in the game, it is their own choice, for which, as well as for their actions in the game space, they are responsible. The same applies to the use of game content on a paid basis. Instead, from the point of view of players, their stay in the game provides economic benefits to the developer—there is a certain symbiosis. In addition, the time spent on the game accumulates in tangible and intangible significance for players, becoming something personal. Legal logic tells us that the right to use as a type of intangible asset should be inherited¹. For example, in case of the death of a player, his heirs have the right to access his account and at least use his virtual gaming property, as the right to use is part of the inheritance. As for the disposal of virtual gaming property and the conflict of interest that arises, we can offer the following algorithm. Its idea is that after buying a particular gaming attribute or other virtual property, the seller (for example, an online games-content developer) receives a percentage of the alienation of virtual property to third parties from the original buyer. This algorithm is already used in NFT-sales, where the author receives a percentage of the alienation from each resale of a copy. NFTs are sold primarily for Ethereum cryptocurrency on decentralized exchanges (Finzer, 2020). This resolves conflicts of interest and can

¹ As for the type of an intellectual property right reputation is an exception for this.

overcome the monopoly of the intellectual property developer in the presence of the virtual property.

While having multiple digital copies is an advantage of virtual ownership, it is not always possible to have these copies. In the absence of digital copies of the virtual property object, in case of damage and loss of the information carrier, for example, destruction or loss of a hard disk, there is a risk of irrecoverable data loss. You may also want to preserve the digital object for as long as you have access to it if it is of value to you. NFTs deal precisely with such cases (for example, saving collectibles, in-game items, cards, or digital art as a unique digital object).

The accumulation of the value of the “goods” of the virtual property leads to the fact that there is a need to pass them on to the next generation. Furthermore, the procedure of registration of the last will of the person for his life concerning his virtual property acquires features. All this is a promising area of research, as it aims to address current and future issues (Alina, 2020).

The factors that affect the speed of proper legislation development on the inheritance of IT objects and virtual property include:

(i) The dynamics of their existence. Since IT objects arise and spread very quickly, as well as expanding the scope of their application while modifying the originals, they also disappear quickly or are replaced by new IT objects (*e.g.*, creating digital images, or turnover of different types of cryptocurrencies). This has a significant impact on the legislative function in this area, which means that state participation is minimal when it comes to the national system of civil law regulation of social relations in the field of IT objects (Alina, 2020).

(ii) Impersonality of the use and possession of individual IT objects. When searching for digital assets, a notary may face problems with the anonymity and confidentiality of their ownership. For example, it is known that the testator owned a digital wallet with a large amount of cryptocurrency. But it is impossible to identify such a wallet if the testator did not provide the keys to it. Thus, the loss of such a wallet by almost 100% means the irreversible loss of assets. Added to this is the general anonymity of being on the Internet, meaning the challenge of establishing a real person by nickname or account on social media. Anonymity decreases only when persons directly claim their rights to digital assets. For example, when they undergo an account verification procedure or if they want to transfer cryptocurrency in cash through a banking institution. In this case, they need to identify and verify themselves.

(iii) Unconventional ways of monetizing individual IT objects and uncertainty of their present and potential value. A proper example of this is

cryptocurrency and Bitcoin as its main representation. Initially, it was an unremarkable innovation, but now Bitcoin holders are equated with the world's wealthy (Böhme *et al.*, 2015). The point is that there is an ambiguity of the long-term result of the digitalization of assets at the moment (Urquhart, 2016; Nadarajah & Chu, 2017). It puts the legislator in an awkward position where digitalization processes are in full swing, gaining momentum, and the legislative framework does not react to this in any way. That is a discrepancy between the actual state of affairs (unregulated sphere of life) and the desire to regulate it. So far, by and large, we are in limbo, and that is the case for virtual property and digital inheritance.

One way or another, virtual ownership cannot exist outside of digital platforms. In this case, an essential aspect for the transfer of at least the right to use such an asset is the transfer of access keys to the account—whether gaming or social network. However, it is not possible to do so by law, as there is no legislative regulation. What then remains to be done?

The first option is beyond legal, informal, and is that a person notifies in the usual way, for example, orally, in writing or electronically, another person he has chosen as an heir, the keys to access his account in the game or social network (this option also applies to e-mail, etc.). In this case, the main task is to transfer to another person confidential information about the user's login and password. Login name and password obviously are protected by a well-known right, the right to privacy. But digital property can include the right to change the password and other things. What is the problem here? First, there is no guarantee that confidential data will not be leaked during the transfer process and will not be lost in this way. Secondly, if everything can be arranged so easily at the household level, why create legal regulation? We believe that adequate regulation, which provides a legal opportunity to transfer access to their accounts by inheritance, solves both of these problems: in the first case, the issue is technical in nature, in the second—it is legal. As for the second, the regulation is necessary to prevent ambiguous interpretation of the right of a person to inherit the right to use his virtual property (at least), and at most—to provide the opportunity to dispose of it. Therefore, the legislator must ensure that the lack of regulation does not create conditions for the oppression of the rights of subjects of inheritance or narrowing of their content. At the same moment, the absence of a specific rule of law cannot be a ground for refusing to protect subjective civil rights (Alina, 2020).

The second algorithm is the use of existing tools of legal regulation. The appointment of the executor of the will can be used for this purpose. In this context, we would also like to draw attention to the institution of trust property. Under this model, one person (the founding owner) can appoint

another person (the trustee) as a trustee of his property (Kolos, 2019; Nekit, 2019). However, this model is valid only if the law provides for the possibility of alienation of property (not just the trustee, but in general). Otherwise, it turns out that the trustee can only transfer the object of virtual ownership for further use following the terms of the agreement on the transfer of the object in fiduciary ownership, which is concluded between the founding owner and trustee. For such a model, it is necessary to at least legislate the possibility of inheriting the right to use virtual property, such as an account in an online game or social network. In the case of recognizing the right to further dispose of such disembodied property, the institution of trust property becomes irrelevant because we can legally provide for inheritance without intermediaries directly in the will or if the inheritance will take place by law.

Additionally, it is worth mentioning that following the *de minimis* rule minor and insignificant games probably should not fall in the provisions of inheritance law (Veech & Moon, 1947).

III.2. National Legislation of Ukraine on Virtual Property and Digital Inheritance

The things in civil law are understood as all the objects of the material world, which can meet the individual needs of man and be in his possession. The basic feature of a thing is its belonging to the material world, objectivity in it, corporeality. The concept of the disembodied thing, which appeared in Roman law, is now applied to property rights and securities (Spasibo-Fateeva, 2015).

Hence, following Art. 316 of the Civil Code of Ukraine, the object of ownership is a thing (property). And under Art. 190 of the Civil Code of Ukraine property as a specific object is a separate thing, a set of things, as well as property rights and obligations. A concept of “thing” in Ukrainian law is interpreted broadly and includes not only objects of the material world, but also disembodied things. Property rights and obligations are in fact incorporeal things and therefore the domestic concept of property rights does not preclude the application of property rights provisions to virtual assets (Nekit, 2019; Alina, 2020).

Inheritance involves the transfer of rights and responsibilities from one individual to another (Article 1216 of the Civil Code of Ukraine). Here we include: (i) all rights and obligations that existed at the time of the opening of the inheritance; and (ii) they did not end with the death of the testator. Exceptions to this rule are given in Art. 1219 of the Civil Code of Ukraine—

it contains a list of rights and obligations that cannot be a part of the inheritance².

This list is exhaustive. It does not contain links, for example, to the impossibility of inheriting an account on social media. Social media accounts are currently objects of a particular tangible and intangible value, but the owners have the advantage in their regulation. Although, nothing prevents you from transferring access to your account by leaving your login and password. Still, this will violate the common rules for the use of social networks³, and also poses a risk of leakage of personal data if the login and password fall into the wrong hands.

According to Art. 32 of the Constitution of Ukraine, no one may be subject to interference in his personal and family life, except as provided by the Constitution of Ukraine. Art. 31 of the Constitution of Ukraine enshrines guarantees of secrecy of mail, telephone conversations, telegraph, and other correspondence. However, the secrecy regime of correspondence applies to any messages, even one that does not contain the circumstances of a person's personal or family life. The secrecy of correspondence is protected primarily by constitutional law, and this applies not only to traditional letters but also to all other means of transmitting information (by phone, e-mail, various messengers, or private messages on the Internet resource). This right is one of those that does not terminate after the death of a person. According to Art. 306 of the Civil Code of Ukraine "in case of death of the natural person who sent the correspondence and the addressee, the use of correspondence, in particular by its publication, is possible only with the consent of their children, widow (widower), and if not—parents, siblings. At the same instant, correspondence that has scientific, artistic, historical value may be published in the way prescribed by law." However, the above articles of the

² The inheritance does not include rights and obligations that are inextricably linked to the person of the testator, in particular: (i) personal non-property rights; (ii) the right to participate in associations and the right of membership in associations of citizens, unless otherwise provided by law or the constituent documents; (iii) the right to compensation for damage caused by injury or other damage to health; (iv) the right to alimony, pension, assistance or other payments established by law; and (v) the rights and obligations of a person as a creditor or debtor, if the obligation is inextricably linked with the creditor, inextricably linked with the debtor and cannot be performed by another person (Article 608 of the Civil Code of Ukraine).

³ See, for example, Facebook and Instagram Terms of Use. "You must not share your password, nor give access to your Facebook account or transfer your account to other people (without our permission)", said in Facebook Terms of Use. "This agreement does not grant any rights to any third parties. You may not assign your rights or obligations under this Agreement without our consent", said in Instagram Terms of Use. See <https://help.instagram.com/581066165581870> and <https://www.facebook.com/legal/terms>.

current regulations cannot be organically applied to online messages, as permission to use correspondence must be granted by persons who are members of the deceased's family and have access to correspondence (in the case of traditional letters). If the solution to the issue of information from messages from the computer and mobile devices of the deceased (provided access to the latter and their content) seems obvious, the question of using correspondence to which relatives do not have access due to their placement on certain resources and personal password protection does not have an unambiguous solution. Several factors must be taken into account when deciding whether to grant access to the deceased's history. First, the factor of the relative anonymity of users on the Internet does not make it possible to unambiguously determine that this account belonged to the deceased. Secondly, it is difficult to determine precisely the content of the will of the deceased to provide access to third parties to their online correspondence. Thirdly, in many cases, it is virtually impossible to obtain the consent of the other party to the messages (for example, due to its anonymity). In addition, the operator of the correspondent information may not even have the technical ability to remotely access the message history.

The national legislation of Ukraine does not provide for the procedure of inheritance of virtual property. This means that both tokens and pages on social networks as well as other disembodied things are not regulated by law. The judicial practice currently does not meet the criteria of sufficiency to speak of a sustainable approach to solving this problem (Alina, 2020). As of intellectual property, we mentioned Art. 29.1 of the Law of Ukraine "On Copyright and Related Rights" above. It states that the property rights of authors and other persons who have exclusive copyright can be inherited, which is not true for personal intangible rights of the author.

III.3. International Experience of Legal Regulation of Digital Inheritance and Virtual Property

It is possible to count the legal regulation on the issue of inheritance of virtual property from the adoption of the United Nations Charter on the Preservation of Digital Heritage on October 15, 2003. Art. 1 of this document states that there is a need to store digital materials for future generations, which may include text documents, databases, images, audio and graphics, software, web pages, etc. Because they are created and exist in the short term and can also exist in many formats, which is also constantly growing, it only reinforces the need to preserve them because they are multi-industry values (Prykhodko, 2019). Due to the actualization of the problem, special terminology acquires a new status. Thus, terms such as "digital

inheritance”, “digital estate”, “data heir” are increasingly used in English-language sources (Rosen, 2012).

If we examine the case law of foreign countries, we can see that courts tend to uphold the rights of users and their relatives, even if the use agreement indicates otherwise (Alina, 2020). For example, in the case of *Ajemian v. Yahoo!, Inc.* Massachusetts Supreme Judicial Court held that personal representatives may provide lawful consent for the release of a decedent’s emails (Harvard Law Review, 2018). In this case, the legislation (The Stored Communications Act), which is a part of the Electronic Communications Privacy Act of 1986) prohibited electronic-communication companies from disclosing a person’s communications to third parties without decedents “lawful consent”. Accordingly, such a requirement was included in the user agreement of telecommunication service providers and social media companies (ibid). Nevertheless, the court decided that a fair exception could be made from this presumption.

At present, in the United States, home of most companies that provide digital technology for general use, no federal laws are governing the inheritance of digital assets. However, some states have passed laws to address this issue. In 2005, Connecticut passed a law that regulates the access of relatives to the deceased’s e-mail. In the states of Idaho and Oklahoma, according to local law, relatives of the deceased can access various objects: blogs, e-mail, and social pages, and in Indiana, relatives have the right to access documents and information stored electronically, or can receive their copy.

In August 2014, Delaware became the first U.S. state to pass a law that allowed family members to access the digital assets of deceased relatives and inherit digital assets (Heddaya, 2014; M&R Blog, 2014). According to the law, the lawyer responsible for fulfilling the deceased’s will may transfer access to his e-mail, social media accounts, subscription to services, cloud storage, and other data posted on the Internet to one family member. The lack of comprehensive legal regulation encourages the Internet company to independently regulate these relations in a contractual form. Modern user agreements provide not only for the closure of user accounts after their death but also the possibility of their complete destruction or memorization of information available there. The latter means the actual archiving of data with the right of limited access to some sections of the account only to registered “friends” of deceased users (Alina, 2020).

For example, a precedent has become known in Germany, according to which the parents of the deceased girl were given the right to inherit her personal Facebook page (BBC News, 2018). In the original lawsuit, the court of the first instance granted her parents’ claims for access to the

account so that her parents could find out whether her death under the wheels of the train was suicide. However, the appellate court decided to satisfy Facebook's requirements for the protection of privacy policy, which prohibits the disclosure of correspondence even after the death of a person. Hence, the case reached the Supreme Federal Court of Germany. In the motivational part of the decision, Judge Ulrich Hermann noted that it was previously accepted to inherit correspondence after the death of the testator, so there was no reason to treat digital messages differently. In addition, it was noted that parents had the right to know with whom their minor child corresponded.

This precedent demonstrates that if such claims begin to multiply, they can be resolved based on the analogy of law, which suggests that legal relations can be settled by their similarity based on common principles for civil law because the rules on the substantive nature of subjective rights already exist. And only the form in which it applies has been changed, namely: instead of correspondence as a thing of the material world in the form of letters or diaries there appeared digital correspondence. However, the fact that the number of such lawsuits will increase over time may indicate the need for unified legislation based on case law. This can help harmonize it and reduce the burden on the judiciary.

In Spain, legislation on digital inheritance is being developed. According to Art. 7 of the draft Charter on Digital Rights, the right of individuals to inherit digital assets and rights acquired in the digital environment should be recognized (Velasco, 2020). Among other things, the document regulates other issues in this area, such as the protection of the rights of minors on the Internet, the regulation of artificial intelligence, etc.

V. CONCLUSIONS

The revenue of the online gaming industry, as well as the general digitalization of communication, poses new challenges to legal science related to the status of IT objects and virtual property. The question of the status of virtual gaming property is acute on the agenda. While logins and passwords are not generally considered to be property objects, the very possibility of inheriting them does not contradict the general notarial practice but may contradict the rules of using the social network, according to which the transfer of an account to third parties is strictly prohibited. In this case, the user can inherit their content such as photos, audio, and video. Also, in this case, the problem of the right of use remains unresolved, because it is a property right of the user. Virtual property issues, if such

assets can be expressed in monetary terms and the heir has the right to access them, are easier to resolve, as they require notarial procedures that do not differ from access to funds in the testator's bank account. The main problem in the field of online games and the inheritance of virtual property in them remains the protection of copyright of game developers. Social networks have a flexible approach to solving the problem and offer their options for solving it in case of the death of the testator, so we can say that most often, such issues will be resolved through a bilateral contractual settlement. Otherwise, there is the option of litigation, where a person can demand recognition of his right to inherit.

One way to solve the problem of protecting the intellectual property rights of content owners is to extend the legal regime of ownership to virtual objects. The way it can be done leads to either judicial review or parliamentary revision. This does not contradict the Ukrainian concept of property rights, which recognizes the possibility of the existence of property rights to disembodied property which are in fact virtual objects. Virtual property rights should be distinguished from intellectual property rights and can be defined as a specific type of property right that is the object of virtual property. In addition to the specifics of the object of such a right (which will always be disembodied things, *i.e.* virtual property), this right will be characterized by the specifics of the grounds of origin, content, protection, etc.

REFERENCES

- Abramovitch, S. (April 15, 2009). *Virtual property in virtual worlds*. <https://www.lexology.com/library/detail.aspx?g=5a3f3b03-a077-45d4-9981-36f713c92820>.
- Alina, S. (2020). *Inheritance of IT Objects under Modern Civil Law. Thesis*. National University “Odesa Law Academy”. <https://hdl.handle.net/11300/12560>.
- Ball, K. *et al.* (2012). *Routledge Handbook of Surveillance Studies*. Routledge. <https://bit.ly/3c7xtVK>.
- BBC News (July 12, 2018). Facebook ruling: German court grants parents rights to dead daughter’s account. <https://www.bbc.com/news/world-europe-44804599>.
- Blazer, C. (2006). The five indicia of virtual property. *Pierce L. Rev.*, 5, 137. https://scholars.unh.edu/cgi/viewcontent.cgi?article=1090&context=unh_lr.
- Böhme, R. *et al.* (2015). Bitcoin: Economics, Technology, and Governance. *Journal of Economic Perspectives*, 29(2), 213-38. <https://bit.ly/2U13aUT>
- Brikše, I. (2003). The information environment: theoretical approaches and explanations. *European Journal of Communication*, 19(2), 368-415. https://www.lu.lv/fileadmin/user_upload/szf_faili/Petnieciba/sppi/mediji/inta-brikse_anglu.pdf.
- Broadband Search (n.d.). Average Time Spent Daily on Social Media (Latest 2020 Data). <https://www.broadbandsearch.net/blog/average-daily-time-on-social-media#post-navigation-0>.
- Buder, J. & Hesse, F. W. (2017). Informational environments: Cognitive, motivational-affective, and social-interactive forays into the digital transformation. In J. Buder & F.W. Hesse (eds.), *Informational environments: Effects of use, effective designs* (p. 1–25). Springer International Publishing AG. https://doi.org/10.1007/978-3-319-64274-1_1.
- Canales, K. (March 25, 2021). The CEOs of Google, Facebook, and Twitter are about to appear before Congress in a misinformation hearing. Here’s why the execs are testifying. *Business Insider*. <https://www.businessinsider.com/twitter-google-facebook-misinformation-hearing-congress-2021-3>.
- Castronova, E. (2001). Virtual worlds: a first-hand account of market and society on the Cyberian Frontier. *CESifo Working Paper Series*, 618. <https://ssrn.com/abstract=294828>
- Cifrino, C. (2014). Virtual property, virtual rights: Why contract law, not property law, must be the governing paradigm in the law of virtual worlds. *BCL Rev.*, 55, 235. <https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3354&context=blr>.
- Clark, M. (March 11, 2021). NFTs, explained. *The Verge*. <https://www.theverge.com/22310188/nft-explainer-what-is-blockchain-crypto-art-faq>.
- Conway, H. & Grattan, S. (2017). The «New» New Property: Dealing with Digital Assets on Death. *Modern Studies in Property Law*, 9, 99-115.

- Danylenko, J. (n.d.). America vs. Apple, Google, Facebook and Amazon. *Adsider*.
<https://adsider.com/america-vs-apple-google-facebook-and-amazon/>.
- Danylenko, O.V. (2016). The Problem of the Object of Civil Rights: a Retrospective Review. *Current Issues of Private Law*, 256-259.
- Deutschland. (2015). In re Facebook Ireland Ltd, Landgericht Berlin, No.20 O172/15, opinion filed 22.12.15. <https://www.kvlegal.de/wp-content/uploads/2016/01/LGBerlin-Urteil-vom-17122015-20-O-172-15-Digitales-Erbe.pdf/>.
- Deutschland. (2016). In re Facebook Ireland Ltd., Kammergericht, No.21 U9/16, appeal filed 01.02.16. <https://www.berlin.de/gerichte/presse/pressemitteilungen-der-ordentlichen-gerichtsbarkeit/2016/pressemitteilung.439714.php>.
- Deutschland. (2016). Kammergericht: Berufung gegen das Urteil über den Zugang von Erben zu dem Facebook-Account einer Verstorbenen eingelegt (PM 6/2016). Pressemitteilung vom 01.02.2016.
<https://www.berlin.de/gerichte/presse/pressemitteilungen-der-ordentlichen-gerichtsbarkeit/2016/pressemitteilung.439714.php>.
- Deutschland. (2018). Rechtsprechung BGH, III ZR 183/17, filed 12.07.2018.
<https://dejure.org/dienste/vernetzung/rechtsprechung?Gericht=BGH&Datum=12.07.2018&Aktenzeichen=III%20ZR%20183%2F17>.
- Deyan, G. (June 18, 2020). How Much Time Do People Spend on Social Media in 2020? In <https://techjury.net/blog/time-spent-on-social-media/#gref>.
- Duranske, B. T. (2008). *Virtual Law: Navigating Legal Landscape of Virtual Worlds*. Chicago: ABA Publishing.
- Durante M. (2017). The Informational Environment. In *Ethics, Law and the Politics of Information*. The International Library of Ethics, Law and Technology, 18. Springer, Dordrecht. https://doi.org/10.1007/978-94-024-1150-8_2.
- Fairfield, J. (2005). Virtual property. *BUL Rev.*, 85, 1047. <http://scholarlycommons.law.wlu.edu/cgi/viewcontent.cgi?article=1449&context=wlufac>.
- Fairs, M. (23 October, 2020). Virtual fashion will allow people to “go completely crazy” online, says Amber Jae Slooten of The Fabricant. *Dezeen*.
<https://www.dezeen.com/2020/10/23/virtual-fashion-amber-jae-slooten-the-fabricant/>.
- Felder, A. (April 23, 2012). Making Real Money in Virtual Games: The Strange Economics of MMORPGs. *The Atlantic*.
<https://www.theatlantic.com/business/archive/2012/04/making-real-money-in-virtual-games-the-strange-economics-of-mmorpgs/256192/>.
- Feuer, W. (January 9, 2021). Mark Zuckerberg just made a bold claim: We’re going to get a ‘breakthrough’ in tech glasses this decade. *CNBC*.
<https://www.cnn.com/2020/01/09/zuckerberg-expects-breakthrough-augmented-reality-glasses-this-decade.html>.
- Finzer, D. (January 10, 2020). The Non-Fungible Token Bible: Everything You Need to Know about NFTs. https://opensea.io/blog/guides/non-fungible-tokens/#Whats_next_for_NFTs_Our_2020_predictions.

- Galloway, S. (2017). *The four: the hidden DNA of Amazon, Apple, Facebook and Google*. Random House.
- Glasser, A.J. (March 1, 2010). Real Money Trading—The Black Market of Online Gaming. <https://www.itbusiness.ca/news/real-money-trading-the-black-market-of-online-gaming/14774>.
- Gong, J. (2011). Defining and Addressing Virtual Property in International Treaties. *BUJ Sci. & Tech. L.*, 17, 101. http://www.bu.edu/law/journals-archive/scitech/volume171/documents/gong_web.pdf.
- Greif, H. (2017). What is an informational environment? In *Environments of Intelligence*. Routledge. <https://www.taylorfrancis.com/chapters/oa-mono/10.4324/9781315408101-6/informational-environment-hajo-greif>.
- Hahn, J. (January 28, 2021a). Buffalo London sets platform trainers ablaze for first digital-only product release. *Dezeen*. <https://www.dezeen.com/2021/01/28/buffalo-london-the-fabricant-classic-burningfor/>.
- Hahn, J. (February 23, 2021b). Andrés Reisinger sells collection of “impossible” virtual furniture for \$450,000 at auction. *Dezeen*. <https://www.dezeen.com/2021/02/23/andres-reisinger-the-shipping-digital-furniture-auction/>.
- Hahn, J. (March 12, 2021c). JPEG file by digital artist Beeple sells for over \$69 million at NFT auction. *Dezeen*. <https://www.dezeen.com/2021/03/12/beeple-everydays-nft-christies-auction/>.
- Hahn, J. (March 15, 2021d). Alexis Christodoulou sells Instagram-famous architectural renderings as NFTs. *Dezeen*. <https://www.dezeen.com/2021/03/15/nft-auction-alexis-christodoulou-homesick/>.
- Hahn, J. (March 19, 2021e). Gucci releases first virtual sneaker that can only be worn in digital environments. *Dezeen*. https://www.dezeen.com/2021/03/19/virtual-25-gucci-wanna-digital-sneaker/?li_source=base&li_medium=bottom_block_1
- Harvard Law Review (May 10, 2018). *Ajemian v. Yahoo!, Inc.* <https://harvardlawreview.org/2018/05/ajemian-v-yahoo-inc/>.
- Heddaya, M. (August 20, 2014). Delaware Becomes First State to Legalize Inheritance of Online Accounts. <https://hyperallergic.com/144662/delaware-becomes-first-state-to-legalize-inheritance-of-online-accounts/>.
- Henderson, G. (August 24, 2020). How Much Time Does The Average Person Spend On Social Media? In <https://www.digitalmarketing.org/blog/february-social-media-analytics-update>.
- Hunt, K. (2007). This Land is not Your Land: Second Life, Copybot and the Looming Question of Virtual Property Right. *Texas Review of Entertainment and Sports Law*, 9, 141-173.
- Hurter, E. (2009). International Domain Name Classification Debate: Are Domain Names Virtual Property, Intellectual Property, Property, or Not Property at All. *Comp.*

- & *Int'l LJS Afr.*, 42, 288. https://heinonline.org/hol/cgi-bin/get_pdf.cgi?handle=hein.journals/ciminsfri42§ion=20.
- Jones, K. (July 15, 2020). Online Gaming: The Rise of a Multi-Billion Dollar Industry. <https://www.visualcapitalist.com/online-gaming-the-rise-of-a-multi-billion-dollar-industry/>
- Kastrenakes, J. (March 1, 2021). Grimes sold \$6 million worth of digital art as NFTs. <https://www.theverge.com/2021/3/1/22308075/grimes-nft-6-million-sales-nifty-gateway-warnymph>.
- Knibbs, K. (March 10, 2021). The Next Frontier of the NFT Gold Rush: Your Tweets. <https://www.wired.com/story/nft-art-market-tweets/>.
- Kolos, Yu. (December 6, 2019). Trust ownership: does it have a future in Ukraine? In <https://vku.ua/publication/dovircha-vlasnist-chi-ie-u-neyi-maybutnie-v-ukrayini>.
- Lastowka, F.G. & Hunter, D. (2017). The Laws of the Virtual Worlds. *Popular Culture and Law*, 363-435.
- Lee, E. *et al.* (2018). No Silk Road for Online Gamers! Using Social Network Analysis to Unveil Black Markets in Online Games. In *Proceedings of the 2018 World Wide Web Conference* (pp. 1825-1834). <https://arxiv.org/pdf/1801.06368.pdf>
- Levytska, N.O. (2019). Modern tendencies of development of normative-legal regulation of digital economy. *Legal Scientific Electronic Journal*, 5, 26-29. http://www.lsej.org.ua/5_2019/6.pdf
- Lin, H. & Sun, C.T. (2011). Cash Trade in Free-to-Play Online Games. *Games and Culture*, 6(3), 270-287. <https://ir.nctu.edu.tw/bitstream/11536/17/1/000293963800004.pdf>
- Lyon, D. & Bauman, Z. (2013). *Liquid Surveillance: A Conversation*. Cambridge, Malden: Polity.
- M&R Blog (September 15, 2014). Can you Inherit a Social Media Account? New Delaware Law says Yes. <https://www.mrllp.com/blog-Inherit-Social-Media-Account-New-Delaware-Law-Yes>
- Metev, D. (February 18, 2021). How Much Time Do People Spend on Social Media? In <https://review42.com/resources/how-much-time-do-people-spend-on-social-media/>.
- Moore, M. & Tambini, D. (2018). *Digital dominance: the power of Google, Amazon, Facebook, and Apple*. Oxford University Press. <http://14.139.206.50:8080/jspui/bitstream/1/7241/1/Digital%20Dominance.pdf>.
- Nadarajah, S. & Chu, J. (2017). On the Inefficiency of Bitcoin. *Economics Letters*, 150, 6-9. <https://bit.ly/3ArkOH9>.
- Nekit, K. (2019). Features of the content and exercise of virtual property rights. *Journal of Civil Law*, 32, 86-92. <https://doi.org/10.32837/chc.v0i32.25>.
- Nelmark, D. (2004). Virtual property: the challenges of regulating intangible, exclusionary property interests such as domain names. *New Jersey*

Technological & Intellectual Property, 3, 1. <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1025&context=njtip>.

- Nelson, J. (2009). The virtual property problem: what property rights in virtual resources might look like, how they might work, and why they are a bad idea. *McGeorge L. Rev.*, 41, 281. <https://scholarlycommons.pacific.edu/cgi/viewcontent.cgi?article=1235&context=mlr>.
- Oosthuyzen, M. (March 24, 2012). The seductive power of Facebook. *Unlike Us Blog*. <https://networkcultures.org/unlikeus/2012/05/24/the-seductive-power-of-facebook/>.
- Origin, Hill Holliday (n.d.). Gen Z—The Social Generation. <https://genz.hhcc.com/hubfs/Gen%20Z%20-%20The%20Social%20Generation%20%7C%20Hill%20Holliday-5.pdf>.
- Palka, P. (2017). Virtual property: towards a general theory. PhD Thesis. https://cadmus.eui.eu/bitstream/handle/1814/49664/Palka_2017.pdf?sequence=1&isAllowed=y
- Parkes, J. (March 22, 2021). Artist Krista Kim sells “first NFT digital house in the world” for over \$500,000. *Dezeen*. https://www.dezeen.com/2021/03/22/mars-house-krista-kim-nft-news/?li_source=base&li_medium=bottom_block_1.
- Peters, J. (March 9, 2021). Jack Dorsey’s first tweet may fetch \$2.5 million, and he’ll donate the NFTy proceeds to charity. *The Verge*. <https://www.theverge.com/2021/3/9/22321464/jack-dorsey-nft-tweet-auction-bitcoin-donate-charity>.
- Prykhodko, L. (2019). Preservation of digital cultural heritage—the imperative of the XXI century (according to documents of UNESCO and the European Union). *Scientific and Practical Journal “Archives of Ukraine”*, 2(319), 67-92. https://archives.gov.ua/wp-content/uploads/2020/01/AU-2_2019_140.indd_pryhodko.pdf.
- Reyes, M. (January 5, 2021). eSports Ecosystem Report 2021: The key industry companies and trends growing the eSports market which is on track to surpass \$1.5B by 2023. *Business Insider*. <https://www.businessinsider.com/esports-ecosystem-market-report>.
- Robertson, A. (March 8, 2021). Mark Zuckerberg says realistic avatars are Facebook’s next big VR bet. *The Verge*. <https://www.theverge.com/2021/3/8/22319737/mark-zuckerberg-facebook-vr-ar-face-sensors>.
- Rosen, R. (May 3, 2012). The Government Would Like You to Write a ‘Social Media Will’. *The Atlantic*. <https://www.theatlantic.com/technology/archive/2012/05/the-government-would-like-you-to-write-a-social-media-will/256700/>.
- Rossow, A. (April 3, 2018). What Is Digital Inheritance And The Future Of Your Assets After Death? *Forbes*. <https://www.forbes.com/sites/andrewrossow/2018/04/03/what-is-digital-inheritance-and-the-future-of-your-assets-after-death/?sh=42be6df737e3>.

- Savych, S.S. (2015). Copyright in the digital environment: the problem of monopoly of the right holder and ensuring the conditions of free use of works. *Bulletin of the Ministry of Justice of Ukraine, 1*, 86-92. <https://bit.ly/3gaPC7q>.
- Skoryk, A. (2018). Informational environment: culturological dimension. *Visnyk Natsional'noyi akademiyi kerivnykh kadrov kul'tury ta mystetstva, 1*(1), 42-46. <http://journals.uran.ua/visnyknakkkim/article/view/159757/158999>.
- Sokolova, G.B. (2018). Some aspects of digital economy development in Ukraine. *Economic Bulletin of Donbass, 1*(51), 92-96. <https://core.ac.uk/download/pdf/154014772.pdf>.
- Spasibo-Fateeva, I.V. (2015). Types of objects of civil rights. *Journal of Civil Law, 18*, 13-18. <http://dspace.onua.edu.ua/bitstream/handle/11300/8269/Chasopys%2013-18.pdf.pdf?sequence=1>.
- Stephens, M. (2002). Sales of in-game assets: an illustration of the continuing failure of intellectual property law to protect digital-content creators. *Texas Law Review, 80*, 1513–1534. https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/tlr80§ion=49.
- Ukraine. (1993). Law of Ukraine “On Copyright and Related Rights”. <https://zakon.rada.gov.ua/laws/show/3792-12?lang=en#Text>.
- Ukraine. (2003). The Civil Code. <https://zakon.rada.gov.ua/laws/show/435-15/conv#Text>.
- Ukraine. State Intellectual Property Service of Ukraine. Recommendations for Internet providers, content providers and users of file sharing networks and other web services on the lawful use of copyright and related rights on the Internet. State Intellectual Property Service of Ukraine. <http://sips.gov.ua/ua/ip.html?s=print>.
- United Nations. (2003). Charter on the Preservation of Digital Heritage. https://www.un.org/ru/documents/decl_conv/conventions/digital_heritage_charter.shtml.
- Urquhart, A. (2016). The Inefficiency of Bitcoin. *Economics Letters, 148*, 80-82. <https://bit.ly/3AuLvdQ>.
- Veech, M.L. & Moon, C.R. (1947). De minimis non curat lex. *Michigan Law Review, 45*(5), 537-570.
- Velasco, M. (December 15, 2020). Draft Charter of Digital Rights. <http://www.velascalawyers.com/en/uncategorised/draft-charter-digital-rights.html>.
- Whatagraph (August 31, 2020). How much time do people spend on social media. <https://whatagraph.com/blog/articles/how-much-time-do-people-spend-on-social-media>.
- Zimmer, M. (2008). Preface: critical perspectives on Web 2.0. *First Monday, 13*(3). <https://firstmonday.org/ojs/index.php/fm/article/download/2137/1943>.