

Trends and Prospects for the Development of Virtual Reality and Digital Property

Elena Anatolyevna Kirillova¹, Oleg Evgenyevich Blinkov^{2,3}, Elena Victorovna Blinkova^{2,4}, Aleksey Sergeevich Vrazhnov⁵ and Firdousi Bilyamudinovich Magomedov⁶

sciencedept@mail.ru

¹Southwest State University, Kursk, Russian Federation

²Academy of the FPS of Russia, Ryazan, Russian Federation

³State University of Humanities and Social Studies, Kolomna, Russian Federation

⁴Russian State Academy of Intellectual Property, Moscow, Russian Federation

⁵Federal State Public Military Educational Institution of Higher Education "Prince Alexander Nevsky Military University" of the Ministry of Defense of the Russian Federation (Military University), Moscow, Russian Federation

⁶Russian State University of Tourism and Service, Cherkizovo, Moscow region, Russian Federation

Summary

The study considers trends and prospects for developing virtual (augmented) reality and civil transactions in relation to digital property. In jurisprudence, there is a need to determine the legal status of virtual and augmented reality to regulate legal relations in the digital environment. Legal relations using new digital technologies require the creation of new legislative approaches and rules of their legal regulation. The article dwells on the legal status of virtual (augmented) reality and determines the methods of regulating legal relations in the sphere of digital property. The study utilized methods for collecting single and multiple facts in order to identify the main trends in the civil circulation of digital assets, as well as private law methods. The methods of generalization, concreteness, induction and deduction reveal the legal nature and main features of virtual (augmented) reality and digital property. The paper highlights the specifics of virtual reality and civil transactions in relation to digital assets. The research has concluded that the sale, exchange and other actions with digital objects in virtual reality have distinctive features, while digital property has also unique characteristics since it is involved in civil circulation and legal relations.

Keywords:

virtual reality, augmented reality, digital property, legal regulation, digital technologies.

1. Introduction

The rapid development of global technologies (blockchain, artificial intelligence, big data, etc.) based on the Internet has led to the emergence of a digital environment in the form of virtual reality, i.e. an active interactive environment with virtual and audiovisual content used for advertising or the sale of goods and digital services [1].

The creation of digital objects in virtual reality stipulates the need to protect intellectual property rights to a domain name, avatar, audio-visual objects, trademark, etc. Copyrights for the use of creative works made in digital form also require legal protection. It is necessary to create

an effective legal mechanism for protecting the rights of owners and users of intellectual digital property [2].

The virtual world built over digital technologies offers new rules for the relationship of actors in virtual (augmented) reality. Digital legal relations can be conducted using computer platforms or private networks, while the contractual terms apply to the parties involved in digital civil transactions users might not be aware of this.

The digital environment does not establish a physical contact between subjects and objects, which poses certain problems for legal regulation. The latter is concerned with real-life actions rather than virtual interactions that are hard to regulate by the existing legal acts. Classical civil law focuses on real actions or inactions of persons in the implementation of legal relations but the digital environment replaces physical reality and establishes new rules for the interaction of contract parties [3]. In addition, when regulating digital legal relations, it is vital to expand the list of protected intellectual objects created with artificial intelligence, smart systems, big data, etc. The study considers the legal status of virtual reality and determines the methods of regulating legal relations in the sphere of digital property.

Legal relations based on new digital technologies require the creation of new legislative approaches and rules of legal regulation.

Many scholars and experts have been determining the legal status of virtual reality (VR), augmented reality (AR) and civil transactions in relation to digital assets. William S. Byassee explored the jurisdiction of cyberspace and the application of real-life precedents to the virtual community. Christopher J. Shifrin considered virtual property and rights to it. David Nelmark studied the issues of regulating such intangible and exclusive proprietary interests as domain names. José van Dijk analyzed digital rights management and the circulation of digital objects. P.K. Hallahan wrote about the protection of digital assets of public relations organizations. L. Brainard examined the circulation of

cryptocurrencies and the possibility of acquiring digital goods with the help of cryptocurrencies. Many other experts addressed the issues of determining the legal nature of virtual reality and the circulation of digital assets, but these studies do not propose any methods of regulating legal relations in the digital environment and do not reveal the main features of civil transactions in relation to digital objects.

2. Discussion

2.1 General Description (Basic Principles and Methods, Description and Characterization)

The research object is the legal status and features of virtual reality, trends and prospects for developing civil transactions in relation to digital property. The study used the following methods: the collection and study of single facts; generalization; scientific abstraction; the methods of discovering regularities. Content analysis was applied to the collected qualitative data. Common topics were identified using keyword and phrase analysis. Using comparative analysis, we considered various definitions of digital property and virtual (augmented) reality. Based on these concepts, we characterized civil transactions with digital assets.

The method of objectivity determined the most burning legal issues in civil transactions with digital assets and suggested possible solutions. Using the method of

concreteness, we proved that it is necessary to create a legal structure in accordance with which digital assets can be the subject of civil law transactions within the functioning of virtual reality.

2.2 Algorithm

The pluralistic approach to understanding the legal status of virtual reality has developed requirements for the definition of digital objects. Using Google Trends, we identified the dynamics of popular search requests for the purchase and sale of digital objects. Based on the results, we concluded that there is a trend of increasing demand for NFTs, i.e. the request frequency increased by 30% in 2021, if compared to 2020.

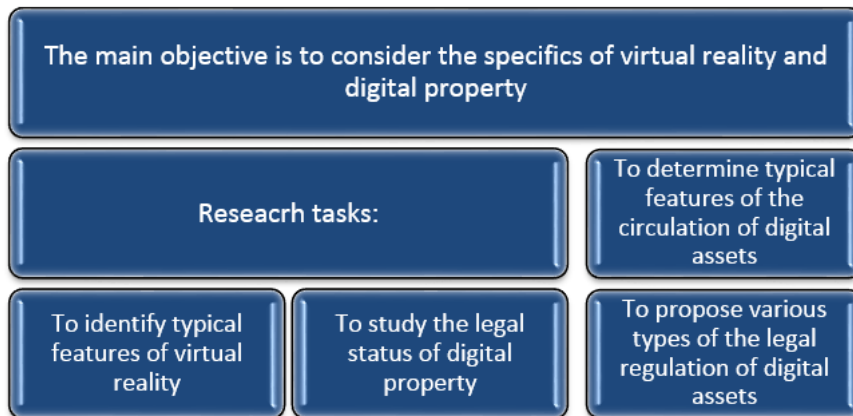
At the stage of collecting and studying specific facts, we used various methods of law interpretation in order to clarify the legal nature and main characteristics of virtual (augmented) reality and digital property.

The prognostic method provided scientifically grounded forecasts on the legal regulation of digital relations and practical recommendations to use traditional legislative acts transforming the physical circulation of goods and services into digital transactions in virtual reality.

2.3 Flow Chart

The study used certain research algorithms to obtain the necessary results. The research algorithm is presented in Table 1.

Table 1. The research algorithm



The development of virtual interaction was facilitated by the COVID-19 pandemic. This spurred the online environment as the safest platform for various actions in the current conditions. Many activities received a virtual form, which has raised many questions for legislators in all countries of the world. For example, how to implement legal regulation in the digital circulation of goods and services; whether the current legislative norms can be

applied to digital legal relations; how the interaction of subjects in a virtual environment should be regulated. As practice shows, legal relations that arise on the Internet cannot always be regulated by classical legal norms. The virtual environment differs from the physical world since it has the principles of transboundary, anonymity, rapid information dissemination, interactive communication and the high latency of criminal offenses. Therefore, it is

necessary to regulate digital legal relations with due regard to typical features of the digital environment.

The creation of the virtual world has developed the circulation of digital objects in the form of digital goods and services, digital works, etc. The process develops rapidly and digital objects are sold and bought, as well as physical values in the form of immovable or movable property [4]. In May, the Italian fashion house Gucci created a digital version of Dionysus Bag that was immediately sold. In the Roblox game, one can buy the Gucci bag for \$4,100, which is \$700 more expensive than in real life. The consumer demand for virtual objects arose quite recently. A significant event was the sale of a digital painting by the artist Beeple in 2021. The buyer paid \$69.3 million for this artwork in a digital form [5]. People are willing to pay money for digital images on the Internet (these are called NFTs and are traded through cryptocurrencies). For some people, it is important to have enshrined rights to a collectible item, and it does not matter whether this item is stored in a safe at home or the rights to it are fixed on the Internet. According to the existing statistics, digital assets were sold for \$3.34 billion in the first half of 2021. Morgan Stanley forecasts the sales growth to \$240 billion (+3400%) by 2030 [6].

The Chainalysis group of companies, which analyzes the cryptocurrency market, issued a report for December 2021 and estimated the annual volume of NFTs at \$40.9 billion. This analytical report indicated that a significant number of investors from different parts of the globe entered the cryptocurrency market to acquire NFTs. At the same time, UBS and Art Basel estimated worldwide art sales conducted in the usual way (without virtual reality) at only \$50 billion in 2021 [7]. The ownership of a digital object is confirmed by a program code, which indicates that a person who owns digital property can perform any actions with it that are not prohibited by law. The main principle is the same as for owning a cryptocurrency, namely an entry in a distributed ledger.

Many websites like www.secondlife.com allow people to make purchases anonymously, which can infringe the copyright of trademarks and other audiovisual content. To make anonymous purchases or sales, buyers create "avatars" and, under their cover, not only participate in online trading but also listen to courses, video lectures, play sports, create unique things, or, on the contrary, copy brands from the real world [8]. The thing is that many sellers of digital goods create virtual stores using logos of well-known companies. This activity is illegal since virtual goods are identical to branded items sold offline. These actions can be regarded as fraud but the current legislative acts, as a rule, do not contain such a set of offenses that can be attributed to violators. In virtual reality, digital goods imitating branded items are sold without the permission of copyright holders. The issue of protecting intellectual property rights in the digital environment is one of the most

acute and intractable. Therefore, the legislator faces a task of creating legal acts that can provide the effective protection of copyright in the virtual world. Technical measures can also be used and are used on the Internet to protect intellectual property, including content copy protection or open licenses.

In addition to generating digital objects, the digital environment is moderated by software, often with the help of artificial intelligence. As a result, a new reality is created that replaces the physical world. Virtual reality is formed for the interaction of subjects with each other and with the participation of artificial intelligence, while control can be exercised by both people and artificial intelligence. Computers that create virtual reality do not belong to citizens as their private property. However, they are located in a large system and are interconnected according to the principle of cloud computing [9]. The creation of artificial intelligence, which can perform not only an ordinary algorithm of actions, allows a person to interact with it. With the help of modern technologies, artificial intelligence is able to fulfill complex activities. Earlier there were phone answering machines, now artificial intelligence can advise customers and comprehend simple situations. Lawyers wonder whether to grant artificial intelligence the status of a subject. Since the capabilities of artificial intelligence are constantly expanding, it is already able to imitate human behavior, i.e. this possibility seems quite real [10]. The interaction of a person with artificial intelligence in the digital environment is promising in social, economic and intellectual terms. However, it can be dangerous to use artificial intelligence: if it gets out of human control, unforeseen situations might arise. The legal status of artificial intelligence has not been determined as no one knows how to respond to possible mistakes that it can make. Thanks to the involvement of artificial intelligence in various spheres of activity, labor resources can be accumulated, while unemployment is one of the most pressing issue in any country.


Virtual reality can be a reflection of the real world and focuses on trade, business and investment. There are trading platforms, shops or exchanges that bring profit to the state treasury, just like real-life enterprises. The virtual environment also provides game content that is in demand and has its own consumers, for example, World of Tanks, Worlds of Warcraft and Pokemon GO. The latter game captured almost the whole world, engaging both adults and children into a virtual hunt.

Being officially recognized as a sports discipline, cybersport should be attributed to interactive activity. With the help of virtual coaches and teams, athletes prepare for competitions remotely. Some competitions can be held online if a type of sports allows it. According to experts, cybersports is not only rapidly expanding and gaining popularity among professional athletes and amateurs, but it

can also become an Olympic sport, while the revenue market in this area is estimated at \$1 billion [11]. In addition to digital assets, there are digitized objects that can exist both in virtual form and in physical form, these include works created online but published on physical media [12]. The electronic form of civil circulation differs

from the circulation of digital objects that exist only in the virtual environment and cannot be used in traditional civil transactions. The main distinguishing features of the circulation of digital objects are presented in the table below (Table 2).

Table 2. Typical features of the circulation of digital objects

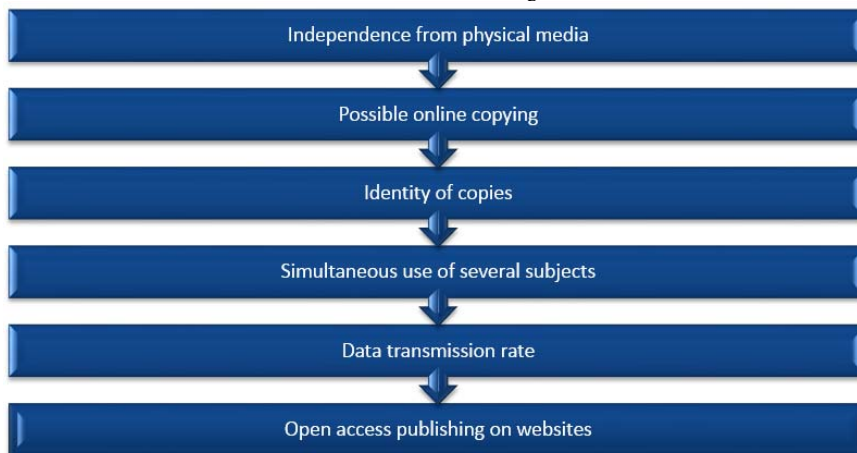


Intangible contract objects
Anonymity of subjects
Transborder legal relations
Supranationality
Latency of criminal offenses
Digital interaction is governed by special rules and license agreements compiled by the parties

In the circulation of digital objects, content is used (in the form of a program code). If content is compared with information in analog form, a number of significant differences can be identified. As a rule, non-digital sources

of information are closely related to material media [13]. The table below presents distinctive features of digital content (Table 3).

Table 3. Distinctive features of digital content



Let us consider how digital assets can be classified as objects of civil rights. Many international legal acts equate intellectual activity, means of individualization (intellectual property) and intangible benefits to objects of civil rights. The protected results of intellectual activity and means of individualization also include software. A computer program is one of the properties of a digital object [14]. In

addition, a digital object is not only based on a program but also uses artistic tools, which means that legal norms on artwork can be applied to legal relations using digital objects of a creative nature. A digital object can be a product of the intellectual activity of developers, artists and programmers, therefore some digital objects can be attributed to intellectual property [15]. In practice, an

approach is used when digital objects are equated with physical objects and their legal regime is established by the analogy of law. However, legal relations in the digital environment have their own specifics and precedents cannot adequately regulate them.

Experts argue how to describe not only online transactions but also transactions with objects that cannot be conducted in physical form [16]. Nowadays consumer interest in the circulation of digital objects grows exponentially. Such trends stipulate the creation of legislative acts on the legal status of virtual reality, digital rights and their scope, digital objects, subjects and effective methods for protecting civil rights when making transactions with digital objects [17]. Scholars develop new principles and methods of legal regulation of completely new legal relations that arise in the virtual environment and are associated with the ownership of digital property [18]. Digital objects are diverse; they have specific features and cannot be described in common terms. They exist exclusively in the virtual environment but they have a real value and can be involved in civil circulation. Thus, the relations of the parties when making transactions with digital objects need legal regulation.

The challenge of making digital transactions might be the anonymity of the parties. Citizens often communicate on the Internet citizens using "nicknames" and "avatars". In case of dishonest behavior or fraudulent actions, it is necessary to hold someone liable and avatars cannot reveal the true identity of their owner [19].

Some experts suggest to involve state regulators in digital legal relations, but this idea seems controversial since such bodies have a territorial location and digital legal relations are cross-border. The optionality of civil legal relations is another argument in favor of their contractual settlement by the parties who made a particular transaction. If the disagreements that have arisen cannot be resolved, the parties must independently resolve issues in the court as it is almost impossible to control the interaction of the parties in the virtual environment [20].

The actions performed with digital objects in the virtual environment (purchase and sale, exchange, donation, etc.) can be enshrined in the form of smart contracts with the preliminary verification of the parties, which will minimize the risks of dishonest behavior. In addition, legislative acts as traditional civil rules regulating legal relations are ineffective in the digital environment having its own laws. In addition to numerous copyright infringements, virtual reality gives rise to completely new crimes that violate civil rights. These include the spread of viruses and malicious programs, DDoS extortion attacks, cramming (billing for the services that were not rendered), credential theft (passwords or logins), etc. There are also problems in the field of privacy. The openness of websites allows unscrupulous citizens use false information to damage the reputation and cause moral harm to citizens [21].

Copyright infringements in the sphere of using domains, audio, video, e-books and other works are considered in the context of intellectual property protection laws, which are not always effective as they were created before the emergence of the digital environment and digital property [22]. In relation to new digital offenses, legislators should develop a new algorithm of actions.

As practice shows, the creation of unified legislative acts regulating legal relations with the circulation of digital objects is a difficult task. Thus, it is recommended to use liability and contract law in this area. Like any other legal relations, relations in the digital environment should be based on the principles regulating the interaction of the parties, including the equality of the parties; the intangibility of transaction objects; cross-border relations; transnationality; dispute resolution based on contract law.

The parties of legal relations in the digital environment can be both individuals and legal entities. The legal status of artificial intelligence is controversial but it is too soon to attribute artificial intelligence to one of the parties at this stage of development. Artificial intelligence can be regarded as an electronic person with limited powers and rights.

New phenomena, including artificial intelligence, digital property, digital transactions, smart contracts and distributed registry, are structural elements of the legal regulation of civil transactions with digital objects that exist along with the traditional circulation [16]. The subject of civil law regulation is digital legal relations related to the circulation of digital assets in the virtual environment created by high-tech means. The owner of digital property has the right to own, acquire, alienate and create it. Transactions in the virtual environment are conducted using smart contracts and distributed ledger technology.

Digital legal relations have their specifics associated with the objects of transactions, the scope of digital rights or the virtual environment in which the parties interact. Therefore, legal acts focused on the physical world are ineffective in this sphere [23]. In relation to digital objects representing intellectual property, some rules protecting copyrights can be applied. However, it is necessary to consider the possibilities of the digital environment, i.e. the rapid change of information, the virtual assignment of copyright, rewriting and copywriting, which allows to customize text and assign it. The recognition of creative results of intellectual activity should not be based on technical resources that reveal the level of borrowing but only on the assessment of professional experts who are able to compare materials and determine the novelty and creative nature of works [24].

Digital civil turnover is not only a turnover associated with intellectual activity, it is closely related to material resources, includes production, distribution, exchange, and has a commodity-like nature. Furthermore, digital objects can exist in the form of services and work performance [25].

It is worth mentioning that civil legal relations in the digital environment might arise in different states. If disputes relating to movable or immovable property and committed in the virtual environment are resolved with due regard to either personal law or the location of such property, the law of the location of a digital object cannot be used in the digital environment since digital objects exist in the form of program code and are not physically connected to any territory. The question arises whether it is better using domicile or residence in disputes over digital transactions with digital property. The possible answer is neither of them since legal regulation in virtual reality is counter-balanced and becomes the rules of conduct that are established with the help of legal regulation. Perhaps transactions that cause disputes between the parties can be resolved using blockchain arbitration to be launched in the near future. It will consider all the features of civil legal relations in virtual reality and the circulation of digital objects.

3. Conclusion

Thus, digital assets are intangible objects of virtual reality modeled by a computer program that have a value and can be involved in civil transactions.

Such transactions in virtual reality has specifics and can be designated as a digital civil circulation based on the principles of equality of the parties; the intangibility of transaction objects; cross-border relations; transnationality; dispute resolution based on contract law.

In the field of digital civil transactions, it is necessary to use the rules of liability and contract law at the stage of concluding agreements. They are able to resolve disagreements that arise at the stage of implementing agreement terms. These rules consider the possible non-performance of contracts due to force majeure and other circumstances.

The further studies should focus on device compatibility that gains much social and economic importance. The automated actions of distributed networks also become the research subject.

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