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THE RESEARCHING OF INFORMATION INEQUALITY IN THE MARKET OF INFORMATION SERVICES

The object of research is information inequality. Information inequality is seen as a socio-economic problem that can be solved with the help of confident actions of the state. Data analysis confirmed the problem of the «digital divide» at the global and regional levels. The transformation of the information services market depends on the quality of the Internet. The growing number of Internet users is a global tendency, but at the regional level it is possible to see clear differences, which creates problems for obtaining quality educational, financial and professional services. Both negative and positive consequences of information inequality are considered. Along with the growing importance of modern information technologies and services in society, inequality between certain segments of the population is growing. Some people for various reasons may have restrictions on access to information, knowledge, information services, new digital products and modern technologies, while others may not have similar restrictions on access to them.

The study found that the market for information services is specific in terms of protection of intellectual property rights. Aspects that would contribute to strengthening the protection of intellectual property rights to information services and products, information security are provided. Negative transactional externalities occur in the market of information services precisely when there is a decrease in information security due to violation of intellectual property rights by one person in relation to another, causing the last damage. To reduce the burden of transaction costs on market participants in information services, the directions of reducing transaction costs at the national level are substantiated. In all countries of the world, the COVID-19 pandemic has exacerbated the issue of information inequality. The study presents the principles for overcoming digital inequality.

Keywords: *information inequality, information services market, protection of intellectual property rights, information security.*

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1. Introduction

The current state of development of the digital economy requires participation of the world in a single global digital space. One of the ways to solve such a complex and urgent problem is the development of the information services market, which is expanding and expanding with incredible speed. Digitization provides a number of positive economic multiplier effects for powerful analytical companies, which include their own production chains in a single information space.

At the same time, there is an uneven distribution of the positive effect of the development and implementation of information technology and digitalization of the economy. Depending on the right choice of mechanisms for the implementation of digital transformation and information technology, for some countries it is progress, for others it is dangerous trends and consequences.

Problems of digital and information inequality have been studied by many scientists, for example, the authors of studies [1–3]. For different countries, information inequality is interpreted differently, but the essence of the characteristics does not change [2]. Information inequality

acquires a dominant and system-forming value in economic theory, because in the process of development it is included in the system of production relations, affects the process of production, distribution, exchange and consumption of information.

Thus, *the object of research* is selected information inequality. And *the aim of research* is to study the information inequality in the market of information services, which is a destructive factor in its development.

2. Methods of research

The study used theoretical approaches of neo-institutional theory, including information asymmetry theory, property rights theory and transaction cost theory. Methods of theoretical generalization and comparison were used to determine the meaning of the concept of «information inequality» and its relationship with other definitions of this terminological field. Analysis, synthesis and scientific abstraction – to identify factors influencing the transformation of the information services market. As well as methods of analysis, comparison and generalization – in summarizing the results of the study.

3. Research results and discussion

At the present stage, «information inequality» is seen as a socio-economic problem that can be solved with the help of confident actions of the state. First of all, «information inequality» can be understood as «digital inequality» («digital poverty»). There are many definitions of «information inequality».

Information inequality is a consequence of economic and technological lag of certain segments of the population, countries, regions from the progressive processes in the field of education, information-communication technologies (ICT), which is not regulated at the state level, at the level of the international community.

Information technologies in general and automation, in particular, are introduced primarily to increase production efficiency and, most often, have an adverse effect on income and wage inequality. Digitization is happening in all areas. For example, mobile technologies can provide small farmers with better access to important information about their markets, help them get fair prices, and improve production planning and commercialization. Learning processes have improved in schools that have integrated ICT into their curricula compared to schools that have not.

Thus, in fact, information inequality primarily depends on the ability to access the Internet, which is the largest repository of information. Despite the fact that the Internet began to function in 1969, when the first network appeared in US universities, today almost half of the world's people do not have access to it. 3.7 billion people worldwide are left without Internet connection due to its lack of accessibility and low level of digital literacy [4].

The transformation of the information services market depends on the quality parameters of the Internet. According to Cisco (an American multinational company specializing in high technology), about two-thirds of the world's population by 2023 will have access to the Internet. By 2023, there will be 5.3 billion Internet users (66 % of the world's population) against 3.9 billion (51 % of the world's population) in 2018 (Fig. 1).

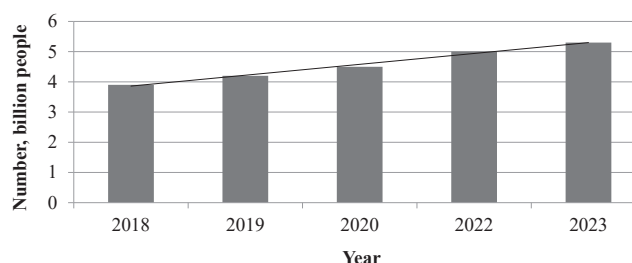


Fig. 1. Global growth of Internet users in the world, billion people [5]

The growing number of Internet users is a global trend, but at the regional level it is possible to see clear differences (Fig. 2). This creates problems for obtaining quality educational, financial and professional services. For example, there is a significant gap between European countries, as shown in Fig. 2.

The differences between developed and developing countries are even more significant [6]. Although the region with the highest rate over the forecast period is North America (followed by Western Europe), the fastest growth is projected in the Middle East and Africa. This will provide an exponential increase in the amount of

information processed by economic entities and will affect the transformation of the information services market.

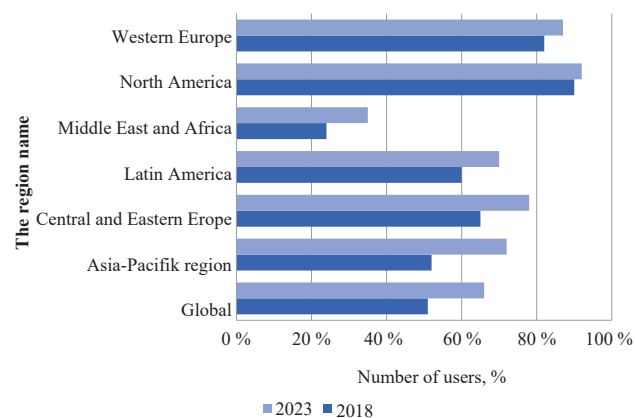


Fig. 2. Number of Internet users as a percentage from the population of the regions of the world

The problem of the «digital divide» is also acute in Ukraine, as the availability of broadband Internet in large cities and small villages is radically different. According to the National Commission for State Regulation of Communications and Informatization, 27 % of fixed broadband Internet subscribers (1.4 million out of 5 million people) are in Kyiv [7]. In order to develop the digital economy in Ukraine, it is necessary to accelerate the development of broadband Internet access and improve the investment climate in the country. From year to year, investments in the Ukrainian IT sector of information technologies are increasing. In 2019, the total amount of venture investments reached 510 million USD, which is one and a half times more than in 2018 [8].

The gaps in the Internet are likely to cause divisions in other areas, in part because the Internet is the main platform for the progress and spread of some other technologies. Wealthier households can afford better online services, while low-income households can only afford lower quality services with slow, blurred images and unstable streaming.

Along with this, digital inequality serves as a field of interaction for cooperation between states with different levels of development of information and communication technologies; however, it is not a consequence of linear social processes [9]. Economically strong countries with developed institutions of politics and law often have preferences in the information sphere. At the same time, countries that have just embarked on the path of introducing new technologies have been able to give impetus to the development of their economies and increase the welfare of citizens.

Thus, in these conditions there is an increase in social inequality. Some members of society successfully adapt to digital transformations, while others do not have such an opportunity due to lack of information and basic level of knowledge. All this in a global sense leads to a growing intellectual gap between information-developed and underdeveloped countries.

The development of information inequality can lead to significant negative consequences in the absence of appropriate economic, legal and social regulatory mechanisms. It is the vulnerability of the subjects of information relations, limited access to modern technologies, the market of information services, new knowledge, that make it possible to limit access

to reliable information and increase its asymmetry. Thus, technically better equipped subjects have the opportunity to manipulate, in the direction they need, the thoughts and behavior of the subjects of information resources.

Digitalization, development of information technologies and the emergence of new information products not only allow to expand communication opportunities, but also create new threats to society and its information security. In contrast to developed countries in Europe and the United States, the protection of intellectual property for IT services in Ukraine is insufficiently regulated, and the judicial method of resolving conflicts is not always effective. Therefore, the issue of copyright protection in the field of legal tech remains unresolved. It is worth noting that since 1997, Ukraine has consistently ranked first among infringers of intellectual property rights. This is confirmed by the annual reports of the International Intellectual Property Alliance for the Protection of Property Rights (IIPA) [10]. The reason for Ukraine's low ratings is the large-scale use of unlicensed software in public authorities, Internet piracy and cybercrime.

In 2001, as the largest market for counterfeit IT products, Ukraine received the status of Priority Foreign Country, as well as earned economic sanctions and the abolition of preferential terms for imports into the United States [11].

It is worth noting that the market for information services is specific in terms of protection of intellectual property rights, as gaining access or any copy, even without losing the information itself, leads to the loss of value of such information. Such actions with it cause the loss of uniqueness of information, create additional opportunities for information manipulation, allow to distort information and turn it into asymmetric, to use certain segments of society for their own useful purposes.

Modern patent law is mainly created in an industrial society and does not fully take into account the specifics of the information society. In particular, this applies to the use of unlicensed programs. Leading the list of hackers in low-income countries. It is also no secret that such violations are not particularly severely prosecuted, as computer manufacturers are interested in promoting their products, which will be significantly slowed down if citizens of low-income countries are forced to buy licensed programs. The growth of incomes of the country's citizens and the creation of conditions for their self-realization can significantly affect the aspirations of modern hackers, and direct their actions in a more positive direction.

Special attention should be paid to solving problems in the legal aspect of regulating the market of information services of Ukraine, which will strengthen the protection of intellectual property rights to information services and products, information security, namely:

1. Creation of a separate law to ensure the protection of intellectual property rights in the IT sphere, which would take into account the specificity of the market of information services, given the successful experience and legal practices of foreign countries.

2. Provide more clear, correct and complete definitions of the concepts specific to the market of information services, including the concept of «computer program» and reflect them accordingly in the legislation.

3. Expand the list of intellectual property rights in connection with the constant large-scale changes and reforms in the field of information technology and digitalization.

4. Improve the mechanism of protection and fight against piracy and cybercrime in Ukraine, to ensure the introduction of such a mechanism in the practice of companies representing the market of information services.

5. Introduce new methods to combat piracy, cybercrime and infringement of intellectual property rights in the information services market not only at the state level but also at the local level (for example, as is done in the United States).

The argument in favor of increasing the protection of intellectual property rights in the market of information services is to reduce the mass spread of negative transactional externalities. They consist in causing damage to individuals or legal entities as a result of violation of their information security, which may occur due to savings on transaction costs for its provision.

Negative transactional externalities occur in the market of information services precisely when there is a decrease in information security due to infringement of intellectual property rights by one person in relation to another, causing the latter damage.

It is through the improvement of their own information security that information market participants need to take care to reduce the effects of negative transactional externalities. Plan in the budget transaction costs associated with the specification and protection of intellectual property rights to their own information services, transaction costs of opportunistic behavior, which consists in the desire of others to obtain individual benefits.

Therefore, to reduce the burden of transaction costs on market participants in information services is possible through the implementation of the following areas of reduction of transaction costs at the national level:

- 1) creation of institutions that carry out depersonalized exchange;

- 2) ensuring by the state the functioning of mechanisms for the protection of property rights;

- 3) realization of the benefits of the modern revolution in science and technology [12]. Let's also do not rule out the presence of significant internal effects of the passive side of information services in the form of transaction losses in the case of information transactions or transfer losses in the case of information transfers. In the case of free information services, implicit transaction costs also increase.

The COVID-19 pandemic has exacerbated the issue of information inequality in all countries of the world. Given that the first to be fired were low-skilled people who could not work from home due to low digital skills, they were among the unemployed. In the United States, marginalized races and ethnic groups (blacks, African Americans, Latinos) are most represented in low-tech occupations, due to decades of inequality in access to important digital services such as a stable and accessible Internet [13]. In Ukraine, the pandemic has also exacerbated the problem of information inequality. The Institute of Demography and Social Research (Kyiv, Ukraine) analyzed the presence of a computer, tablet (laptop) in the family based on the survey of living conditions of households, depending on the income level and place of residence of the family (Fig. 3). It was concluded that among the poorest groups, only 55 % have a computer (tablet, laptop), slightly more than half (56 %) of rural residents have a computer (laptop) at home.

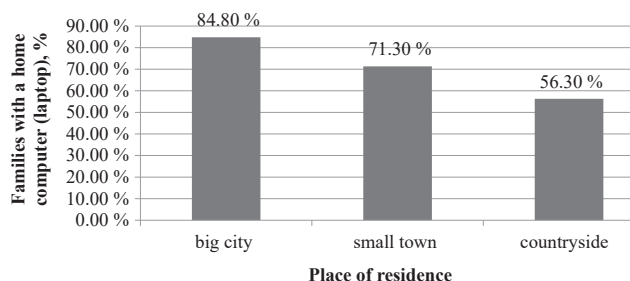


Fig. 3. The presence of a home computer (laptop) deserted from the place of residence [14]

In the period of coronavirus, for the new robot, it is not only a computer that is required, but rather the Internet. In Ukraine, 37 % of the population does not use the Internet [14]. The analysis shows that there is a great number of people of the senior age (60 % of 61–65 children and 92 % of 75 children and seniors), a significant number of people of the middle age (older than 40 years) did not use the Internet before the pandemic.

To overcome the digital divide, at least:

- improvement of legal, economic conditions and business environment conducive to the development of production and use of ICT, as well as other modern technologies, in particular, mobility technologies;
- improvement of infrastructure: transport and, first of all, infocommunication as a set of computer equipment, communication lines, networks and data transmission channels;
- development of human potential, which is determined by the levels of education of the population, its computer literacy and motivation of the population in the use of modern technologies [15].

4. Conclusions

The study found that the digitalization of the economy is changing the market for information services. The transformation of the market of information services allows to equalize the opportunities of different segments of society by ensuring public access to information and creates new social elevators. In turn, the gap is widening due to barriers to accessing information from different segments of society, creating a new line of stratification at the lower levels of social groups through the stratification of their capabilities. However, only members of society with direct access to information and information resources have such an opportunity. Due to insurmountable obstacles in accessing information from different segments of society, a new line of stratification is being created at the lower levels of social strata. Such stratification causes and increases the number of frauds and crimes related to information and information services.

The results of the study will be useful to governments and businesses to overcome digital inequality. COVID-19 will push for digital transformation, because in a state

of crisis, economic actors are more motivated to change. It is concluded that the full digitalization of the economy cannot be allowed, as not all people have access to quality use of modern technologies. In these conditions, the joint work of business and the state is important for the development of mechanisms to overcome digital inequality and achieve the goals of sustainable development.

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