

# QO‘QON UNIVERSITETI XABARNOMASI

ILMIY-ELEKTRON JURNALI  
9-SON

**KOKAND UNIVERSITY** | **2023**  
**HERALD** | **VOLUME №9**

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UNIVERSITETI  
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UNIVERSITY  
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**ВЕСТНИК  
КОКАНДСКОГО  
УНИВЕРСИТЕТ  
ВЫПУСК 9**

9/2023

# QO'QON UNIVERSITETI

## XABARNOMASI

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("Вестник Кокандского университета – Kokand University Herald") ilmiy-elektron jurnali Qo'qon universiteti Kengashining qaroriga asosan tashkil etilib, 2020-yil 10- oktabrda O'zbekiston Respublikasi Prezidenti Administratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligi tomonidan №1138 raqami bilan ro'yxatidan o'tkazilgan, shuningdek davlatlararo standartlar talabi asosida O'zbekiston Milliy kutubxonasidan jurnal uchun 2181-1695 ISSN-raqami olingan.

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**Tahririyat manzili:**

150100, Farg'ona viloyati, Qo'qon shahri, Turkiston ko'chasi, 28 a-uy, 1-xonadon

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## INSTITUTIONAL ASPECTS AND RISKS IN THE DIGITAL ECONOMY: WAYS TO REDUCE UNCERTAINTY FOR ECONOMIC AGENTS

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### MAQOLA HAQIDA

**Qabul qilindi:** 24-dekabr 2023-yil

**Tasdiqlandi:** 26-dekabr 2023-yil

**Jurnal soni:** 9

**Maqola raqami:** 5

**DOI:** <https://doi.org/10.54613/ku.v9i9.827>

**KALIT SO‘ZLAR/ Ключевые слова/ keywords**

information asymmetry, electronic platform for digital portfolios, institutional traps, quality of information flows, rationality in the digital economy, digital economy.

### ANNOTATION

In the rapidly evolving landscape of the modern world, the inexorable shift towards a digital revolution is reshaping traditional economic models across the globe, including the Republic of Uzbekistan. This article delves into the impediments posed by institutional constraints in the digital economy, elucidating how legal frameworks governing digital interactions and inefficient institutional arrangements can impede the development and optimization of digital business models. Notably, the absence of clear regulations on electronic payments, cybersecurity, and data protection can introduce unpredictability, jeopardizing security and trust within the digital environment. The abundance of data and information, coupled with unequal distribution among market participants, may lead to suboptimal decision-making, inefficient resource utilization, and disparities in access to digital opportunities. The article aims to analyze and propose strategies to overcome institutional limitations and information asymmetry, emphasizing the need for effective institutional structures and mechanisms. In conclusion, this article provides a comprehensive examination of the challenges and opportunities in optimizing the digital economy in Uzbekistan. By proposing strategies to address institutional constraints and information asymmetry, it offers a roadmap for fostering a thriving digital ecosystem that benefits all stakeholders in the Republic of Uzbekistan.

**Introduction.** The modern world is inevitably heading towards a digital revolution, covering all spheres of our lives and reformatting traditional economic models. The digital economy acts as a powerful engine of growth and innovation, impacting not only the global level, but also the Republic of Uzbekistan. This trend opens up new horizons for businesses, consumers and society as a whole. Nevertheless, along with the benefits of the digital economy come challenges related to institutional constraints and information asymmetry.

Institutional constraints, such as legal rules governing interactions in the digital economy and inefficient institutional arrangements, can be an obstacle to the development and optimization of digital business models. For example, the lack of clear rules and legislation regarding electronic payments, cybersecurity and data protection can cause unpredictability and threaten security and trust in the digital environment.

In addition, information asymmetry is emerging as a major challenge in the digital economy. In the context of abundant data and information, unequal distribution of information resources among market participants can lead to inappropriate decisions, inefficient use of resources and inequality of access to the opportunities of the digital economy.

In light of these challenges, the task of optimizing the digital economy and overcoming institutional limitations and information asymmetry becomes important. To achieve this goal, it is necessary to develop and implement strategies and mechanisms that can ensure the effective functioning of digital platforms, increase trust and security, and guarantee equal opportunities and access to digital resources. The aim of this study is to analyze and present possible strategies to optimize the digital economy by overcoming institutional constraints and information asymmetry. The article will discuss the importance of developing effective institutional structures and mechanisms that promote a favorable environment to foster digital entrepreneurship and innovation. Particular attention is paid to eliminating information asymmetries and ensuring equal access to information resources so that all participants in the digital economy can realize their full potential.

The article's coverage of information asymmetry is aimed at identifying problems and proposing methods for overcoming it in the digital economy. The importance of ensuring equal access to information resources is seen as a key aspect for maximizing the potential of all participants in the digital ecosystem.

**Research methodology.** This study will focus on analyzing the key factors that are sources of uncertainty and rationality in the digital economy. We will then consider the possible types of risks associated with information asymmetry, using the labor market as an example, and their relationship with institutional traps. The final part of the study is devoted to the consideration of a variety of methodologies and relevant data aimed at reducing these risks and avoiding falling into institutional traps.

The research methodology is based on theoretical concepts put forward in the extensive literature on the digital economy, uncertainty and information asymmetry. The author uses both qualitative and quantitative research methods based on statistical data and economic models to analyze in detail the risks and their consequences associated with possible entry into institutional traps<sup>1</sup>.

An important component of this methodology is the analysis and study of case studies focused on the labor market in the context of the digital economy. In this context, data is collected on the behavior of economic agents and the evaluation of their decisions under conditions of uncertainty and information asymmetry.

The researcher relies on qualitative materials such as reports and publications from international organizations, economic think tanks and academic articles to support the conclusions and justify the proposed risk mitigation methods. Data from various sources are also used to support the conclusions and justify the proposed risk mitigation strategies<sup>2</sup>.

**Analysis results.** In this section, we will analyze the main findings related to the impact of information and digital technologies on economic processes. It should be noted that the increasing use of information technologies and innovations reduces the relevance of the problem of limited resources, allowing economic agents to use available resources more efficiently or create alternative ones. However, the growth of

<sup>1</sup> Kurpayanidi, K. I. (2023). Analysing the functioning of enterprise management in the context of institutional reforms. *Yashil iqtisodiyot va taraqqiyot*. Vol. 10. 581-586. URL: <https://yashil-iqtisodiyot-taraqqiyot.uz/journal/index.php/GED/article/view/111/107>

<sup>2</sup> Kurpayanidi K. (2023). Raqamli iqtisodiyot sharoitida axborot kamchiliklari va institutsional cheklolarni bartaraf etish. *Iqtisodiyot Va ta'lim*, 24(5), 45–50. [https://doi.org/10.55439/ECED/vol24\\_iss5/%x](https://doi.org/10.55439/ECED/vol24_iss5/%x)

information flows and knowledge entails new challenges for economic agents. Information overload makes it difficult to perceive, process and select information, which in turn complicates rational decision-making.

In this regard, our goal is to study how information and digitalization affect the behavior of economic actors and what characteristics of information can make it more effective in a digital economy. According to Avdokushin and Kuznetsova (2022), the environment interacts with humans, expanding its boundaries<sup>3</sup>.

In the period of universal digitalization, socio-economic processes become dependent on increasing information technology processes. This requires personalization of production and marketing as well as educational services and training to adapt to individual or even single consumer needs. According to Alvin Toffler (2022), in the future companies and customers will interact through information technology so intensively that it will be difficult to determine who is a consumer and who is a producer<sup>4</sup>.

The term "digital inequality" was introduced into scientific circulation by L. Myasnikova and A. Zuev in 2003. Their study focused on the concept of "digital revolution" and predicted that changes in technology would lead to a decrease in information inequality<sup>5</sup>. The work of M. A. Gruzdeva (2022) considers the "virtual space of labor" and its stratification, as well as the risks arising in different directions of business activity<sup>6</sup>.

The work of G. R. Garipova, (2015) reflects the deep penetration of information processes in socio-economic relations<sup>7</sup>. In her opinion, science, technology and information are relatively independent factors that are interrelated and determine the productive forces in the economic system.

The development and globalization of information and economic processes require temporary decisions regarding the intensification of functioning and expansion of the Russian segment on the Internet. This provides free access to the global web and digital space, but, at the same time, creates prerequisites for the emergence of institutional traps, which emphasizes the need to strengthen information security<sup>8, 9</sup>.

According to the study of Ershov, N. A., & Alexandrova, M. V. (2019), the intensive development of digital socio-economic trends provides a country with the opportunity to achieve competitive advantages on the world stage and brings significant benefits to its citizens. However, the universal transformations associated with digitalization require the improvement of administration institutions and the transfer of effective management tools and methods to different levels of management (Sologub, V. A., & Khasheva, I. A. (2021)<sup>10</sup>. This raises the need for better management methods, as digitalization causes fundamental transformations in the economic paradigm (Zozulya, D. M. (2018)<sup>11</sup>.

Information and digital transformations enrich the scientific vocabulary with new terms such as information flows, internet of things, virtual enterprises, network communications and artificial intelligence (Greengard, S. (2016)<sup>12</sup>. When analyzing the changes associated with the information stage of development, Zolaev, E.A. (2022) relies on the theory of post-industrial society, which classifies the history of social development and reveals the content and structure of each stage<sup>13</sup>. However, the approach presented by Pang, J., Zhang, Y., & Jiao, F. stating that a developed society should be based on the interaction of cultures, including beliefs, and not only on knowledge, is also close to this study<sup>14</sup>.

Thus, the results of the study emphasize the importance of learning and adapting to the new challenges associated with the development of the digital economy and the urgent need to improve governance practices and

institutional arrangements to successfully adapt to the new economic paradigm.

**Discussion.** The impact of information asymmetry on the functioning of the economy represents a significant factor in the modern information society, where information plays a key role. The study of the effects of information asymmetry and its interaction with institutional traps becomes relevant in the context of economic development. Institutional traps are negative phenomena in which the institutions of the economic system become an obstacle to development, establish inefficient rules of the game and limit the freedom of choice and innovative activity of economic agents.

Before discussing the main results, the author presents his conceptualization of the key concepts used in the study. An institutional trap is defined as an imbalance or disequilibrium arising in a system due to inefficient but stable institutions, resulting in serious socio-economic losses. On the other hand, asymmetric information in its distribution implies the existence of information that is not available or known to other economic agents. This leads to inefficient use of resources, increased uncertainty, reduced trust and incentivized opportunism.

Having an understanding of the basic terms, the author proceeds to present the main results of the study. The analysis confirms that information asymmetry can be a key factor influencing the formation of institutional traps. When some economic agents possess information that is not available to others, it causes imbalances in the system, which can lead to the strengthening of inefficient institutions and create unfavorable conditions for economic development. This, in turn, increases the risks of opportunistic behavior and reduces the motivation for innovation and efficient use of resources.

Thus, the study emphasizes the importance of exploring the relationship between information asymmetry and institutional traps. Understanding this relationship can contribute to the development of more effective strategies to overcome the negative effects of information asymmetry and enhance the stability and development of the economic system. The results obtained represent a meaningful contribution to the field of economic theory and can be used to formulate more effective policies and strategies in today's digital economy.

The study of the impact of information asymmetry on the expectations of economic actors: peculiarities of motivation of knowledge-workers becomes more relevant in the light of the peculiarities of motivation of knowledge-workers. The term "knowledge-workers", introduced by F. Machlup, refers to a new class of workers with competences and skills to work effectively with information, data and knowledge, taking into account external factors<sup>15</sup>. These highly mobile workers strive for self-realization and self-expression, corresponding to the highest levels of A. Maslow's hierarchy of needs<sup>16</sup>.

There are several types of classification of knowledge workers, including active (knowledge-producing workers)<sup>17</sup> and passive (knowledge-using workers)<sup>18</sup>. Others distinguish between creative individuals (knowledge-workers)<sup>19</sup>, technical staff (data-workers)<sup>20</sup> and workers engaged in the first stages of processing incoming information (information-workers)<sup>21</sup>.

According to the study of Yang, L., (2022) the formation of intellectual capital is accompanied by certain trends, such as increasing homogeneity of the structure of the group of individuals-carriers of

<sup>3</sup> Avdokushin, E. F., & Kuznetsova, E. G. (2022). The sharing model as a determining factor in the functioning of a modern business. *Bulletin of Kemerovo State University. Series: Political, Sociological and Economic Sciences*, (2 (24)), 201-211. In Russian

<sup>4</sup> Toffler, A. (2022). *Powershift: Knowledge, wealth, and power at the edge of the 21st century*. Bantam.

<sup>5</sup> Zuev, A. G., & Myasnikova, L. A. (2003). The digital revolution is ahead. *Free Thought*, (5), 55-63. In Russian.

<sup>6</sup> Gruzdeva, M.A. (2022). The age factor of the digital divide: the edges of inequality. *Economic and social changes: facts, trends, forecast*, 15 (4), 228-241. In Russian.

<sup>7</sup> Garipova, G. R. (2015). The information picture of the world as a socio-cultural phenomenon. *Humanities, Socio-economic and Social Sciences*, (5), 20-23. In Russian.

<sup>8</sup> Pang, J., Zhang, Y., & Jiao, F. (2023). The Impact of the Digital Economy on Transformation and Upgrading of Industrial Structure: A Perspective Based on the "Poverty Trap". *Sustainability*, 15(20), 15125.

<sup>9</sup> Sun, Y. Y., & Higham, J. (2021). Overcoming information asymmetry in tourism carbon management: The application of a new reporting architecture to Aotearoa New Zealand. *Tourism Management*, 83, 104231.

<sup>10</sup> Sologub, V. A., & Khasheva, I. A. (2021). Current trends in the development of the processes of digitalization of public administration. In *Digitalization of public administration, economics, politics and the social sphere: problems and prospects* (pp. 53-61). In Russian.

<sup>11</sup> Zozulya, D. M. (2018). Digitalization of the Russian economy and Industry 4.0: challenges and prospects. *Issues of the innovative economy*, 8(1), 1-14. In Russian.

<sup>12</sup> Greengard, S. (2016). *The Internet of Things: The future is already here*. Alpina Publisher.

<sup>13</sup> Zolaev, E.A. (2022). Economic security of the state: the concept and threats of digitalization. *Economic Security*, 5(2), 571-582.

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intellectual capital. This is due to the similarity of motivations, desire for co-operation and common standards, values and attitudes<sup>22</sup>.

Thus, the study of the relationship between information asymmetry and the motivation of intellectual workers represents a significant aspect for understanding the functioning of modern economy and developing more effective management strategies in an uncertain and rapidly changing information environment.

George Akerlof, an American scientist and economist who won the Nobel Prize in Economics in 2001 for his analysis of markets with asymmetric information, is at the forefront of information economic theory, together with Joseph Stiglitz and Michael Spence<sup>23</sup>. His "lemon market" model reveals how information asymmetry can cause a backward selection problem.

In his model, Akerlof links uncertainty and the quality of goods, showing unexpected causes of possible market collapse. With unequal access to information in a market where buyers have to rely on market statistics to determine the true characteristics of goods known only to sellers, transactions fail or lead to unfavorable outcomes. In the case of symmetric information, both parties can benefit from the transaction. However, asymmetric information forces market participants to rely on chance and can lead to market failure.

Akerlof developed his model by studying the market for used cars, or so-called "lemons," to better understand the problem. Suppose there are 100 citizens in the market who want to sell their old cars and 100 citizens who want to buy them. It is known that 50 of the cars on offer are "plums" (low quality) and 50 are "lemons" (high quality). The owners of each car are aware of its quality, but the potential buyers do not know whether the offered car is a "plum" or a "lemon".

Owners of "lemons" are ready to sell their cars at the price of 1000 USD, and owners of "plums" - at the price of 2000 USD. Buyers are ready to pay 2400 USD for a "plum" and 1200 USD for a "lemon". If assessing the quality of cars was a simple task, there would be no problems in this market. "Lemons" would be sold at prices from 1000 to 1200 USD and "plums" at prices from 2000 to 2400 USD. However, buyers cannot determine the quality of a car accurately, but can only assume its true value. Assuming that a car is equally likely to be both a "plum" and a "lemon", a typical buyer will be willing to pay the expected value of the car, i.e. half of 1200 USD plus half of 2400 USD, which equals 1800 USD.

Owners of "lemons" will certainly agree to such a deal, but owners of "plums" will not be willing to sell their cars at such a price. The price that buyers are willing to pay for an "average" car will be lower than the price that owners of "plums" want to get. As a result, only "lemons" at the price of 1800 USD will be offered on the market. However, if a buyer is sure that he will get a "lemon", he will not be ready to pay 1800 USD for it. The equilibrium price on the market will be set between 1000 and 1200 USD. Only "lemons" will be sold at this price. Thus, although the price at which buyers are willing to buy "plums" exceeds the price at which sellers are willing to sell them, the "plums" will still remain unsold.

The reason for the market crash is that there is an externality due to sellers of high and low quality cars. The decision to sell a low quality car affects the buyer's perception of the quality of the "average" car on the market. This leads to a decrease in the price that buyers are willing to pay for an 'average' car and creates a negative effect on those trying to sell high quality cars. This externality becomes a major cause of market failure.

The market is more likely to feature cars that owners are keen to get rid of. The fact of sale serves as a signal to potential buyers regarding the quality of the goods on offer. The oversupply of low quality cars creates difficulties in selling high quality goods.

Given that demand in a given market depends not only on price but also on quality, a scenario is possible in which the demand turns out to be zero and, as a consequence, the market ceases to exist. J. Akerlof shows that insufficient information about the quality of goods offered for sale leads to a constant decrease in prices until the market completely disappears.

The American economist Joseph Eugene Stiglitz (2019) in his study discusses in detail the problem of asymmetric information, focusing on less informed market participants, citing insurance companies as an example<sup>24</sup>. The mechanism of "reverse market adaptation" described by Stiglitz

suggests that well-informed market participants can pass information to those who are less informed, helping them to improve their position. In collaboration with Michael Rothschild, Stiglitz presented a classic paper examining information flows in insurance markets where firms do not have information about the risk of individual customers<sup>25</sup>. In this paper, the authors argue that insurance companies, as less informed parties, can effectively incentivize their better-informed customers to disclose real insurance risk.

In conventional market models, banks set higher interest rates to compensate for the risk of potential loan defaults. In the context of models with asymmetric information, banks offer favored loans to attract competition among a limited number of applicants and to select those who are guaranteed to repay the loan. An important conclusion of the analysis of financial markets presented by Stiglitz and his co-author Sandy Grossman was the Grossman-Stiglitz paradox<sup>26</sup>.

The Grossman-Stiglitz paradox is that if the market is efficient in terms of information, that is, all the necessary information is reflected in prices, no market participant will use the information contained in prices as an effective incentive. Thus, the information available on the market is not fully used due to the asymmetry of the information.

Joseph Eugene Stiglitz, Sandy Grossman and George Akerlof have demonstrated that asymmetric information can lead to reverse selection in the market. Under certain conditions, more informed market participants can increase their market opportunities by transmitting signals to less informed market participants. The concept of market signals was first introduced in the article "Labor Market Signals", which considers education as an indicator of labor productivity in the labor market. The model assumes that the probability of finding a good or bad employee is 50%. A good worker is able to produce 20 units of marginal product, while a bad worker can produce only 10 units. Let's say a company needs to hire 100 employees. The total marginal product is  $50 \cdot 20 + 50 \cdot 10 = 1500$  units. If the share of wages in the produced product is 20%, then the cost of wages will amount to 300 units.

If it is not possible to determine the quality of an employee in advance, a more reasonable approach is to establish a payment of four units for a good employee and two units for a bad employee. However, due to the inability to distinguish between good and bad workers and predict the results of their work, the employer is forced to pay an average salary of three units. Provided that both categories of workers agree to such conditions, wages are redistributed from good to bad workers. It is obvious that good workers tend to acquire some kind of attribute (for example, diploma, certificate, certificate of qualification, etc.) that distinguishes them in the labor market during the assessment process or outside it. This feature, called a "signal" by Michael Spence, makes it possible for good workers to stand out in the labor market.

The main conclusion of Michael Spence is the fact that employers use education as a side sign of future employees. Obtaining reliable information about the potential productivity of an employee is too expensive, so some kind of indicator (signal) is required, which indirectly indicates this quality. One of these indicators is the availability of an education, such as a college or higher education institution. With this knowledge, future employees invest their time and resources in education in order to "signal" their high productivity to employers. Despite the fact that education in itself does not guarantee the availability of skills or knowledge, it becomes an effective indicator for employers when making a decision about hiring employees.

Apparently, the signals coming from the labor market do not always provide a complete picture of the future needs of employers. Perhaps the signals received from the labor market may reflect only the current needs of employers, but do not always provide information about their future needs. The labor market reflects the situation related to the supply and demand for certain types of jobs and skills at the moment. However, the prospective needs of employers may change over time due to technological changes, economic factors, and other circumstances. This implies that changes in employers' needs and requirements for employees may be limited or occur more slowly than necessary to ensure the sustainable development of the labor market.

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Nevertheless, an analysis of the current situation on the labor market indicates the tendency of employers to increasingly prefer to hire specialists with higher education. Companies with sufficient financial resources can even finance the training of specialists of the required level and profile at universities<sup>27</sup>.

The study presents current scenarios demonstrating that in order to achieve success and meet the needs of economic agents, it is necessary to strive to maximize profits and meet their expectations. However, the question remains as to which information should be used to meet the needs and, to a lesser extent, change the expectations of economic actors. The author believes that in order to answer this question, it is necessary to analyze the basic properties of information that can best meet the needs and expectations of economic agents.

The first aspect worth paying attention to in the context of information is its ability to be understood and adequately interpreted by the recipient. Therefore, the producer of information must present it in such a way as to match the target audience.

The second property is the difficulty of providing or using information. The user should not spend too much time and effort solving the uncertainty about the product or service. Therefore, the choice of the form of transmission of the message should not require additional costs from the recipient.

The third property of information is its adequacy to the needs, situation and level of development of the recipient. The information must correspond to the needs and level of education of the recipient for effective impact.

Further, the relevance of information at the right time is another important property. Information must be provided in time to be useful, as, for example, in the case of a warning about the threat of an impending hurricane, which must be delivered in advance to take the necessary measures.

Consistency is another important characteristic of information. The data contained in the message must be consistent with the general topic and subject of the information.

The structuring of information determines its ability to be systematized and classified within the subject and object of information.

The sorting of information implies the absence of excessive information or noise that can distract the recipient. The efficiency of information is determined by the frequency and timeliness of its provision. The information must be received at the right time. The actual reflection of reality is a property of information that determines its accuracy, corresponding to the real state of things. The appeal of information refers to its ability to influence the recipient's actions. Informativeness determines the completeness of information and the ability to reduce the asymmetry of information. The determinacy of information is related to its correspondence to the homogeneity or heterogeneity of the target audience. The manageability of information refers to its ability to be promptly cancelled, revoked, or adjusted. The ethics of information presupposes its compliance with the norms, rules and morals of the society in which it is presented. The objectivity of the information implies the absence of subjective assessments of the manufacturer regarding the described reality and the information itself.

Given the contradictory nature of information, it is impossible to fully assign all these properties to it. The assessment and measurement of these characteristics is also hampered by the lack of universal methods and methods.

When using information by economic agents, a high degree of subjectivity is observed, which affects many properties of information and increases asymmetry and risk, both moral and material. The asymmetry of information leads to information costs, including the costs of determining prices, searching for effective prospects and low prices, as well as information obsolescence, market conditions and other factors. In theory,

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the concept of search was supposed to eliminate differences in prices and justify the economic behavior of subjects. However, in practice, comparing prices at different points of sale can significantly change the expectations of economic agents and significantly influence their behavior. Price information "allows us to reformulate the subjective tasks of consumers in terms of risk, which changes their approach to search."

Let's consider the problem of ensuring the completeness of information, which can be achieved only in two cases: centralized pricing and the local market. In the first case, with a limited number of transactions, participants can be provided with complete information by the central planning authority. In the second case, even if the subjects do not have sufficient information in advance, their personal reputation serves as a reliable guarantee of the absence of fraud and the use of information to the detriment of others in order to gain unfair competitive advantages.

Depending on the degree of completeness of information, a person strives for an ideal or purposefulness, assuming the expectation of certain behavior of surrounding objects and other people, as well as using this expectation as conditions and means to achieve their rational goals. However, in practice, such ideal behavior is difficult to implement, since it implies complete freedom of choice of goals and means for achieving them by a person.

Thus, the presence of information inequality leads to a change in expectations and an increase in the level of risk for economic entities. However, this problem can be solved by endowing information with certain properties in accordance with the subjective rationality of economic agents.

In relation to the labor market under study, it is possible to reduce the asymmetry of information by creating an ideal international electronic platform. This platform should include a portfolio of potential employees, which is formed throughout their educational and work path, including the results achieved in various companies and organizations. Educational organizations and employers should have access to this platform.

However, there is a difficulty in developing a system of criteria for evaluating the effectiveness and productivity of potential employees, which should be acceptable to the entire global community. It is this approach that will reduce information costs when concluding employment contracts.

**Conclusion.** Research conducted in the field of uncertainty and rationality in the digital economy confirms that an increase in the volume of information and knowledge can cause problems for economic participants. This creates difficulties in understanding, processing and selecting relevant information. It is important that this information meets expectations, helps to make rational decisions, increases usefulness and reduces uncertainty. As a result, this contributes to improving the efficiency of institutions.

An analysis of the asymmetry of information and possible problems related to the functioning of the labor market in the context of digitalization of educational services shows that the standard qualification indicator - a higher education diploma is not always a reliable indicator of an employee's future productivity. This can lead to problems for employers, increasing the risks of additional costs, reducing the efficiency of the company and possibly leading to the loss of market positions.

To reduce the risks of problems at the institutional level for economic agents, it is necessary to take into account the quality of information and information flows. This allows you to balance the asymmetry of information, meet expectations and rationality in decision-making, reduce the possible costs of opportunistic behavior and increase the level of trust in transactions.

In the context of the labor market, it is recommended to create an electronic platform that will contain digital portfolios of potential employees formed throughout their entire educational and work path. This will help reduce information costs for employers and prevent possible problems at the institutional level associated with the depreciation of a higher education diploma.

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