

The Impact of the Development of Digital Information Technologies on the Labor Market

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Abstract

This article presents data on the state of the process of digitalization of the economy and concludes about the high level of development of information infrastructure, at the same time, there is a strong gap in the level of digitalization between regions. When assessing the impact of the development of Internet technologies on employment, two main consequences are identified: a decrease in the impact of the geographical factor on supply and demand in the labor market and the involvement of previously unoccupied social groups in the production process. The results of these consequences are divided into opportunities and threats for the population, and their analysis is carried out separately for the population of the periphery.

Keywords: Information Economy, Digital Economy, Digitalization, Labor Market, Employment, Income, Standard of Living, Information Technology, Internet.

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INTRODUCTION

In recent decades, one of the main trends in the development of the economy and society as a whole has been the penetration of information technologies into various spheres of human activity. Informatization is becoming such an important factor in increasing labor productivity and improving the quality of life that researchers consider the changes taking place as the onset of a new stage of economic development. This stage of economic development in the literature is characterized by the term "information economy"[1-2]. Today, the development of informatization is primarily associated with the introduction of digital communication technologies, the platform for which is the Internet and mobile devices. [3]. The sector of the economy based on such technologies has been called the "digital economy".

The digital economy is defined as "economic activity in which the key factor of production is digital data, the processing of large volumes and the use of the results of analysis of which, in comparison with traditional forms of management, can significantly increase the efficiency of various types of production, technologies, equipment, storage, sale, delivery of goods and services" [4].

One of the most important areas from the point of view of the welfare of the population, which is influenced by the development of the digital economy, is the labor market and small businesses that do not involve the use of hired workers (for example, services offered on freelance exchanges). We believe that the consequences of digitalization of

employment may be different for the center, i.e. relatively developed settlements with high incomes, and the periphery — less developed settlements with low incomes. Although, of course, the main changes in the labor market caused by digitalization are similar for all regions. The difference in the state of the economy between the center and the periphery is typical for many countries of the world.

We will assess the opportunities and threats of digitalization of the economy for the population from the point of view of employment of the workforce and highlight situations in which the consequences for workers of the periphery will have specifics. Analyzing the impact of information and communication technologies on the labor market and entrepreneurship, two main consequences can be identified: firstly, in the digital economy, the effectiveness of employee-employer interaction (as well as customer and contractor) ceases to depend on their location; Secondly, the digital economy is changing the rigid working day schedule adopted in the industrial form of production, making the use of the employee's human capital flexible.

Reducing the role of geographical location as a factor of individual supply and demand in the labor market. As it was shown above, our economy is characterized by unevenness in the level of average wages in different regions. In other words, the place of residence of an employee is a key factor in the individual labor supply and, accordingly, a factor determining the level of his salary. The development of the Internet is beginning to change the situation for certain sectors of the economy. First of all, we are talking about labor and business activities that have an informational nature. The

professional activity of such specialists as programmers, copywriters, designers, administrators of online stores and websites, Internet marketers, employees of call centers, etc., does not depend on their real location, since they can work remotely. Gradually, with the development of appropriate digital platforms and communication technologies, doctors, psychologists, teachers, tutors, financial sector workers and lawyers are switching to remote work (so far only partially). Instagram Facebook, etc., allows you to share professional information and earn income from your knowledge. In addition, many specialists from seemingly uninformative professions are beginning to provide information services on the Internet, since such social digital platforms as Youtube, Instagram, Facebook, etc., allow you to s Opportunities:

1. An increase in the income of workers in the periphery from information activities due to remote work and an increase in employment, since remoteness from the economic center ceases to limit the demand for information labor. At the same time, there is a reduction in the gap between the wages of workers living in the center and the labor incomes of workers in the periphery, since the latter are more competitive due to the low labor supply price. By the way, this process leads to an increase in the wages of information workers compared to non-information workers on the periphery and to its relative decrease in the center. Here professional information and earn income from your knowledge.
2. It is important to note that management activities are also informational in nature, which means that the effectiveness of interaction between administrative staff and subordinates, thanks to new digital technologies, becomes less dependent on the physical distance between them. The consequence of this process is the transfer of part of the business processes from the center to the periphery in order to save on labor, rent, etc., which, of course, has a positive effect on local labor markets. A striking example of such a business model is the Chinese "Taobao villages" [5]. The Taobao marketplace and developed delivery services provide an opportunity for rural residents to specialize in the production of any demanded goods and sell it through an online store.
3. Reduction of barriers in the labor market and weakening of the monopoly power of some groups of specialists. Internet technologies reduce entry and exit barriers in the labor market related to geographical location, which increases competition and reduces the monopoly power of scarce specialists. The positive result of this process is an increase in the quality of services offered on the market, and the appearance of motivation among employees to increase labor efficiency and self-development.
4. Strengthening specialization by expanding the sales market. Adam Smith also pointed out the importance

of the size of the economy for the development of production and the process of division of labor [6]. Many types of work and services become profitable only after reaching a certain volume of the sales market. The digital economy makes it possible to offer services, the provision of which was previously unprofitable in relatively small settlements. In addition, the expansion of the sales market for information-intensive services triggers a mechanism for a positive effect on scale, so that the production of information goods is competitive even in small settlements.

5. Reducing discrimination in the labor market. The implementation of a discriminatory policy by the employer in order to minimize costs has two forms. The first form is monopsonal discrimination, in which the employer sets a differentiated salary for each employee, trying to bring it as close as possible to the price of the individual labor supply. The second form includes statistical discrimination that occurs in a situation of strong asymmetry of information in the labor market. In this case, the employer, in an effort to minimize costs and risks, in conditions of information uncertainty, sets wages based on information about the average efficiency of the employee in each of the groups.

Digital communication technologies reduce the power of the employer, increasing the choice of jobs for the applicant. Statistical discrimination also decreases, since in remote employment, secondary signs of an employee that do not affect the productivity of his work remain invisible to the employer. The opportunity to switch to work via the Internet, for example by becoming a freelancer, will allow discriminated groups of the population to improve their financial situation and get a fair assessment of the quality of their human capital.

6. Equalization of access of residents of different territories to knowledge. In the modern economy, the main factor of competitiveness in the labor market is the intellectual human capital of employees. The concentration of the best educational institutions and other sources of professional knowledge in the center largely determines its better economic situation compared to the periphery. The development of the Internet environment in general and online education in particular reduces this gap in the quality of the educational environment and makes residents of the periphery more competitive. Note that, despite the high availability of broadband Internet connection in our country, the development of online education is still at an early stage.

THREATS

1. Increased price competition. On the one hand, workers from the periphery, who have approximately the same level of qualifications as workers from the center,

benefit from price competition, since they are willing to work for lower wages, but on the other hand, Internet technologies allow workers from even poorer territories (for example, from other countries) to enter the market, which unleashes a price war. In addition, in the labor market with price competition, relatively low-skilled workers, whose work is easily amenable to automation, offer their services first of all. Therefore, having won in wages at first, low-skilled information workers in the future can be replaced by technologies, the creation of which is stimulated by the desire to reduce costs. A striking example is the market of standard services for creating websites, where the standard work of web programmers has gradually been replaced by ready-made solutions (CMS systems). Using such systems, an ordinary advanced user can quickly make a fairly complex website without the help of a programmer (creating CMS systems already requires highly skilled creative work, so the demand for such professionals will only grow).

2. The Vanek—Reinert effect. E. Reinert [7], analyzing the consequences of international trade for countries at different stages of economic development, concluded that with relatively open trade relations between a developed country and an undeveloped one, the former will specialize in knowledge—intensive production, and the latter in resource-intensive. With the emergence of a single labor market and information services, a similar situation may arise for the center and the periphery. Employees of the center will be more competitive in providing services that require creative intellectual work, and employees of the periphery will be more competitive in providing services related to routine work. As a result, the periphery will specialize in services for which the cheapness of labor is important, not its quality. Such specialization has negative consequences, especially in the long term, since in the modern economy it is intellectual labor that is the main source of added value. In addition, this will have a negative impact on the human capital of the regions and will inevitably cause the migration of highly qualified workers from the periphery to the center.
3. The rise of cybercrime and fraud. The high level of anonymity in the interaction of the contractor and the customer of work in the Internet environment, compared with traditional forms of employment, causes problems such as deception by the customer of the contractor and vice versa. In addition, the ignorance of many Internet users with the rules of information security and the activities of hackers create a threat of loss of personal data of employees, withdrawal of funds from bank cards by fraudsters, etc.

Entry into the labor market of previously unemployed workers. The human capital of the population in our economy is still not fully used. One of the reasons for this is the existing

institutions. For example, the availability of social guarantees such as maternity leave and child care benefits leads to the withdrawal of some women from labor relations,⁹ and restrictions on child employment and the existing school education system prevent the use of the labor potential of adolescents. Another reason is the binding of workers to stationary workplaces and standard working hours in the industrial economy, the inability to be physically present at the workplace all the time does not allow people with disabilities, students, housewives, etc. to fully realize their human capital. The development of Internet technologies and mobile devices makes these problems less significant for information-intensive activities. Anyone who is able to offer an information service to the market and has free time for this can do it in the digital economy, regardless of their social characteristics. The emergence of digital platforms implementing the model of the economy of shared consumption [8] allows people to extract income from their unoccupied resources and provide services in different markets in an "unprofessional" mode. For example, with the help of platforms for joint trips (carpooling), car owners, while traveling on their personal business, simultaneously provide transport services, transporting passengers who are satisfied with their route. As a result, a lot of people who were not previously engaged in this type of activity enter the passenger transportation market.

The entry of previously unemployed workers into the labor and services markets leads to the same consequences both in the center and on the periphery, but since the problem of unemployment and poverty is more acute for the latter, it is the residents of the periphery who will benefit the most from this phenomenon.

OPPORTUNITIES

1. Income growth of the population due to part-time employment and entrepreneurship. With the help of Internet technologies, a part of the population whose access to the labor and services market was previously difficult can be involved in the economy, which will solve a number of social problems. As an example of this process, we can cite the dramatic development of the production of clothing and accessories at home. This is evidenced by the success of trading platforms like Wildberries, which provide access to distribution channels to microbusiness. In 2019 this company became the fourth by capitalization among the largest companies on the Runet according to Forbes [9]. Significantly, the third place was taken by Avito, which is also a representative of the peer-to-peer economy. People who already have a source of income, but have a certain amount of free time, can increase their well-being with the help of the Internet, receiving additional earnings.
2. Reducing dependence on one place of work, i.e. reducing the monopsonal power of the employer. In the

digital economy, people can manage their employment more flexibly and choose a way of earning that will allow them to realize their personal goals (getting an education, raising children, etc.).

Threat: the entry of a large mass of unskilled workers into the market and the strengthening of information asymmetry. The Internet and related digital platforms dramatically reduce barriers to entry into markets. This can lead (and is already leading) to the appearance of a huge number of employees of dubious quality offering their services at low prices in markets where previously mainly professional workers operated. Such a trend inevitably increases the asymmetry of information in the labor and service markets, which causes the displacement of qualified market participants by unskilled ones due to the effect of unfavorable selection. Accordingly, according to the theory of opportunistic behavior, there is a decrease in the quality of services provided. An example of this phenomenon is the freelance service markets, where it becomes difficult to find a good specialist due to the many inexperienced participants, as well as a drop in the average quality of content in blogs for the same reason.

In conclusion, we can say that the development of the digital economy, in addition to improving the quality of life in general, should cause some leveling of the standard of living in developed and poor regions and territories. The population of small towns and rural areas gets a chance to earn income by using the large market of economic centers. Therefore, the creation of equal access to the Internet for all residents of the country is the most important task of the state. At the same time, it should be understood that the availability of Internet infrastructure alone is not enough to reduce information inequality. It is necessary that the population of the periphery receive the necessary skills and learn how to use all the possibilities of the digital economy [10].

In addition, an important social consequence of the digitalization of employment, which determines the need for state support for this process, are the opportunities that new technologies provide to women on parental leave, disabled people and other groups of the population who find it difficult to fully work as usual. It is also important to understand that the change in the form of interaction between people caused by the digital economy entails the need for changes in regulatory support, in the tax system, etc. The former institutions of control of labor relations and entrepreneurship in the new economy are losing their effectiveness.

The number of Internet users in different age groups of the population, %*.

Age, years	Use the Internet	Use the Internet on smartphones	Use the Internet on tablets
16–29	98	83	33
30–54	82	58	20
> 55	36	14	7

* Compiled according to: URL: <http://www.gfk.com/ru/insaity/press-release/issledovanie-gfk-proniknovenie-interneta-v-rossii>

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