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Digital Economy, Information Society and Social Challenges in the Near Future

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Abstract:

According to the digital economy, data in the digital form should become the key factor of production. In some studies, the digital economy is even interpreted as a new technological order and the fourth industrial revolution.

At the same time, it is born and develops in the environment that is now commonly called the information society, being the basis for its life activity and experiencing, in its turn, the influence of the socio-cultural processes taking place in it.

In this regard, we believe that if changes in the scale of the industrial revolution do occur, this will affect not only the economic situation, but also substantially rebuild the entire current social reality with its social institutions and regulatory complexes.

This article shows at which levels such changes can occur. Initially, the existing and forecasted indicators of the digital economy in Russia and other countries are consistently considered in the article. Then the influence of digital technologies on the social stratification of society is shown. Finally, turning to modifications in the perception of information and the worldview of the personality in the digital era, the research is concluded by the demonstration of how the acting subject based on the reconstructed value systems makes decisions in the economic sphere that contribute to the further introduction of new technologies into the life styles of modern society.

Keywords: *Digital economy, industry, information technologies, social responsibility, stratification, normative complexes, value systems.*

JEL Classification Codes: *A 12, A 13, O 33.*

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1. Introduction

The notion of "digital economy", which appeared in the mid-90s of the last century, has already taken its strong position both in scientific discourse and in government programs and forecasts of economic development. Moreover, some researchers (Schwab, 2016; Smorodinskaya and Katukov, 2017) are already talking about the firm entry of a new mode of production into the daily life of developed and developing countries and even of the fourth industrial revolution. And if this is true, then processes of such scale will inevitably change not only the economic situation. The processes will also substantially redraw the entire social reality with its multiple regulatory complexes within which individual and collective economic entities are able to operate. This paper contains an attempt to show at what levels of socio-economic life of society the most significant changes can occur and what social groups and institutions can be affected by these processes.

2. Theoretical, Informational, Empirical and Methodological Grounds of the Research

An interdisciplinary approach (Ivanov and Malinetskii, 2017) using the methodology of economic and sociological, socio-philosophical, historical and cultural studies is the most appropriate for our study.

We used methods of factor analysis, comparison, grouping for the analysis of economic indicators. In the course of studying the social and cultural consequences of the development of the digital economy phenomenon, the methodology of structural functionalism (to investigate causes and ways of possible regrouping of elements of the social system) and poststructuralism (to consider the gradual shifts in the cultural paradigm of the new information society) became fundamental.

Two mutually directed vectors of social and economic development are singled out: 1) the development of the digital economy as a mode of production, entailing the emergence of new production relations and, subsequently, the new social structure of society; 2) the emergence of new value systems on the basis of a change in the type of perception and, possibly, the production of information due to the use of previously unknown ways of structuring and broadcasting − and the influence of these socio-cultural patterns on the economic situation.

Thus, our study will include two parts. In the first part we shall show what the current trends in the development of the digital economy in Russia and in the world are, what trends of the use of digital technologies in production are (Vovchenko *et al.,* 2017a 2017b; Akopova and Przhedetskaya, 2016). The second part of the work will cover social and cultural processes accompanying the introduction of digitalization in the lives of ordinary citizens who create and use new values and meanings in a changing reality. The established values and meanings will then form

the basis for the worldview, goal-setting and economic activity of themselves and, at the very least, the next generation.

We believe that the issues of the digital economy should be considered not only separately and isolated from other humanities, but also within that wider range of links that form a phenomenon researchers call a modern information society. In 1983, considering questions of the origin and significance of the new concept of the "information society" at that time, Crawford (1983) mentions Machlup (1962) among the authors who first used the phrase to analyze the influence of information on the development of society, and first of all, its economy. Then the works of Drucker (1969) and Bell (1976) were published, who further developed the concept of the future society of information and knowledge, firmly embedding it in the existing scientific discourse. Lyotard (1984), Castells (2000), Webster (2002), Toffler (1980) and many others can be also mentioned among the authors who had a significant influence on the research of the information society. Thanks to these authors, a modern understanding of the information society has emerged as a pluralistic, multicultural conglomerate in which temporal, spatial and social boundaries previously seeming insurmountable are eroding, and the main value is information. Also in 1968, Drucker (1969) wrote that the increased importance of knowledge, precisely as a high education, will lead to the strengthening of the positions of the social stratum of specialists possessing this knowledge in the society of the future. Some time later Bell directly insisted that it was this layer of experts that gradually can reach the leading positions in society.

Talking about the developing digital economy, its application aspects and business activity in the information environment as a whole, Oxford Economics published an analytical work in 2011, in which, firstly, the relationship between economic growth and the introduction of new technologies is directly traced. Secondly, it is shown that companies of developing countries are able to significantly enhance their competitive advantages with the help of these technologies (Oxford Economics, 2011).

In the 2012 edition of McKinsey, an essay collection examines various aspects of the impact of the Internet on economic development, including on the labor market, employment, the emergence of new specializations and skills (Bughin and Manyika, 2012). As representatives of business admit (Telstra Corporation Limited and Deloitte Digital, 2012), the main value of the companies of the future will be motivated, educated employees, commercial success depending even more on their activities than on the material assets of the organization. At the same time, as Ursula Huws (2015) shows, the traditional structure of large corporations, often aimed at standardization and control, contradicts the need to constantly keep the motivation and loyalty of highly qualified specialists.

In addition to the above works, every year more and more academic studies are devoted to such aspects of the digital economy and the information society as a

whole as data protection, as well as legal and social guarantees for users of virtual platforms and other rapidly developing services (Goos, 2018; Crabtree *et al.*, 2016; Hagen, 2018; Raue, 2018; Wadmann and Hoeyer, 2018).

3. Results

3.1 The concept and essence of the digital economy; dynamic indicators of its current development in Russia in comparison with other states

First of all, let us turn to the definitions used in official documents in the Russian Federation. In the "Strategy of the Information Society Development in the Russian Federation for 2017 - 2030", the digital economy is defined as "economic activity, its key factor of production being data in the digital form, processing large volumes and using analysis results in comparison with traditional forms of management increasing the effectiveness of various types of production, technology, equipment, storage, sale, delivery of goods and services". In the program "Digital Economy of the Russian Federation" we also see that the digital economy is the one "in which data in digital form is a key factor of production in all spheres of social and economic activity".

Another document is "Program of development of digital economy in the Russian Federation until 2035", created by the Centre for the Study of the Digital Economy, which was presented on April 14, 2017 on the site of the Analytical Center under the Government of the Russian Federation. This program gives a very detailed and rather precise definition: "digital (electronic) economy is a set of social relations that arise when using electronic technologies, electronic infrastructure and services, technologies for analyzing large volumes of data and forecasting in order to optimize production, distribution, exchange, consumption and raising the level of social and economic development of states". This definition reflects, on the one hand, the gradual formulation of a suitable terminology for its object, on the other hand, the direction of the digital economy to optimize production, as well as its integral content as a new type of social relations.

Indicators of the development of the digital economy in Russia in recent years show a generally positive, but still unstable dynamics. Thus, the gross added value of the information and communication technology sector (hereinafter referred to as "ICT") almost doubled from 2010 to 2016. If in 2010 it was 1354 billion rubles, then in 2016, according to preliminary estimates, it should have risen to 2258 billion rubles. At the same time, based on these figures, the share of the sector as a percentage of GDP not only had no increase, but even decreased slightly from 3.4% to 2.9% (Abdrakhmanova *et al.*, 2017).

Nevertheless, according to the forecasts of McKinsey's experts (Aptekman *et al.*, 2017), the digitalization of the Russian economy is capable of becoming the most important source of economic growth, providing GDP growth from 4.1 to 8.9 trillion

rubles by 2025, which will be from 19% to 34% of the total increase in GDP. The main source of GDP growth in this regard will be the optimization of production and logistics operations (through monitoring production lines, optimizing logistics routes and identifying priority areas). Besides, the efficiency of the labor market can significantly increase by means of more efficient and quick search and placement of vacancies and the emergence of more remote workplaces.

Experts also forecast a general increase in labor productivity and equipment, efficiency of R&D, a reduction in resource consumption and production losses. This very ambitious image is encouraging, although it makes us think about the resources needed for such a rapid economic and technological leap, and therefore causes caution of some representatives of the Russian expert community (Ivanov and Malinetskii, 2017).

Active development of the digital economy requires the active engagement of the state. This was the case in those countries that are currently the flagships of digitalization: in the USA, China, Singapore, the EU countries. In the UAE, Saudi Arabia, Malaysia, New Zealand, the developing digital economy also received significant state support. So, there is a program "Electronic economy" in the USA, "Strategy of development of the digital economy" and "Industrial strategy" in Great Britain, the program on digitalization of industry Industrie 4.0 in Germany, the program "Made in China 2025" in China and so on. In this regard, the emergence of such strategic documents in Russia is not only justified, but also serves a necessary step in the context of modern technological initiatives rapidly developing and introduced into the production.

According to McKinsey experts, the development of the Russian digital economy is extremely fast: in the period from 2011 to 2015, it grew 8.5 times faster than the Russian economy as a whole, providing a quarter of the country's GDP growth. Digitalization, as these experts believe, is capable of giving Russia a unique chance for economic growth, which is already facilitated by the already well-developed ICT infrastructure. Although it should be noted that in the development of the ICT sector in some regions of the country there are quite noticeable differences. Moscow, Moscow region, St. Petersburg are much ahead of other subjects of the Federation. Such a "digital inequality" is quite expected to reflect the existing uneven socio-economic development of the regions.

And yet, the gradual introduction of new technologies of digital transformation − such as 3D printing, additive technologies, robotization, Internet of things, "cloud" technologies, big data and much more − can fundamentally change the entire current structure of production. As these processes are going on in Russia and in the world as a whole, we shall consider how these processes are carried out in Russia and in the world on the whole by the example of the industrial sector. Perhaps, one of the most notable and large-scale changes happen in this sector now.

It should be noted that the level of digitalization of Russian industry is still behind a number of advanced countries. According to Rosstat, only 22.1% of organizations used ERP systems in the manufacturing sector in 2016, 5.6% of organizations implemented SCM systems. Table 1 reflects more detailed application of information technologies in this sphere.

Table 1. *The use of information technologies in manufacturing industry (% of total number of organizations)*

	2016	2017 (preliminary estimates)	2018 (forecast)
"Cloud" services	23.2	25.8	28.1
ERP systems, %	22.1	24.5	25.4
CRM systems, %	15.0	17.2	18.6
SCM systems, %	5.6	6.1	7.4
Program facilities of automatization of the processes of analysis and control over the security of computer systems	31.0	35.3	39.2
RFID technologies	8.7	11.4	12.8

Sourse: *Compiled by the authors on the basis of Rosstat database.*

According to our forecasts, the share of enterprises using information technology will constantly increase, especially in the application of computer security systems.

The dynamics of indicators of Internet technologies usage in Russian organizations is quite interesting. In 2010, as it was expected, the entrepreneurial sector was leading (63.8% of organizations), the second place was occupied by state and local government bodies (55.2%), while social organizations (49.2%) remained on the third place. In 2015, this ratio has notably changed. By this time 84.5% of state and municipal government organizations and 79.3% of social organizations use broadband Internet. Entrepreneurship with 78.9% is in the last place. Such dynamics can be explained by the successes of the policy of digitalization of the work of state organizations, the introduction of e-government. On the other hand, it is explained by a number of economic difficulties faced by many private companies (Abdrakhmanova *et al.*, 2017).

The already mentioned "digital inequality", the lack of qualified specialists, uneven supply of software products should be enumerated among factors hampering the development of the digital economy. However, the main reason restraining the digitalization of Russia and not yet getting close to the level of the leading countries of the digital economy is the lack of investment. Russian companies do not invest enough in increasing labor productivity, creating new products and services, not mentioning the high-tech technologies required for it. Comparing the volume of investments of private companies in digitalization, it is only 2.2% of GDP in Russia, while it is 5% in the USA, 3.9% in Western Europe (Aptekman *et al.,* 2017).

The economic situation of the past few years has adversely affected the total volume of investments by companies in fixed assets, including the acquisition and introduction of new technologies. The venture investment market being an important element of the digital economy also suffered. In 2014-2015, we observed a failure in the Russian venture capital market, and although by 2016 the situation has gradually changed, Russia's share in world markets is still small. According to KPMG's data, in 2016, the total volume of the global venture capital market amounted to $ 127.4 billion, Russia's share in it not exceeding 0.7%, while the shares of the United States and China amounted to 54% and 24% respectively (ITAR-TASS, 2017).

Digital modernization of the economy requires significant financial injections and government support. Special economic zones, various forms of public-private partnership could become effective tools for attracting capital (Akatkin *et al.,* 2017; Garnov and Agibalova, 2012).

Another alternative way to finance digital economy projects can be crowdfunding − a form that involves collective voluntary contributions from a variety of investors. Crowdfunding differs from simple collection of donations in its reward for sponsors of projects. However, this form of financing in Russia is still not very popular. In addition, crowdfunding can have different efficiency for different sectors of the economy for a number of reasons.

We believe that the development of the economy, especially the digital one, is a process that should include a number of areas: state support, investment climate change, improvement of the legal framework, scientific and technical developments, monitoring and analysis of socio-cultural trends, at the level of which new forms of economic activity are introduced in everyday practices.

3.2 Impact of information technologies on socio-cultural processes of contemporary society

The emergence and spread of a certain new technology that significantly optimizes production, logistics or management, always leads to the fact that economic ties are gradually changing and restructuring (Khitskov *et al.,* 2017). New means of production require new production relations ─ the labor market structure is also restructured respectively (Novikova *et al.,* 2018). All this, in turn, entails the emergence of new ties and destruction of some old social ties, the emergence of new social strata, which, like all strata in the process of formation, are initially unbalanced in terms of their main features: the level of prosperity, political power, education and social prestige. This imbalance is being gradually redressed by means of each emerging stratum, including other social groups, which under certain conditions can create hotbeds of tension in society. This is what the Marxists once called a change in the socio-economic formation, when economic changes inevitably entail social and cultural changes.

Rapid digitalization of society affects not only the major players of national economies and the international sector. It influences the level of social relationships between individuals and groups not less, and in the long term, perhaps more significantly (Ershova, 2018; König, 2017; Ranchordás, 2017).

A digital society is a society that lives in a situation of constant changes and a very rapid technological progress. In this connection, such social groups as professional communities of highly educated experts that are capable of continuing education, generating new solutions and searching for interdisciplinary ones come to the forefront. The number of such specialists (as well as generally educated people) is constantly growing, and it is quite possible that in the near future they will form a full-fledged social stratum. It can differ from other strata in that they in due time, possessing a high level of prosperity or power, improved other signs then; here, such a "primary" sign can be precisely education as a high level of training and education throughout life.

At the same time, as we said earlier, the increase in the influence of certain social groups is due to the decrease in the influence of others. In this case it refers to those who, for various reasons, are outside the sphere of information technology. Gradually, such groups will be increasingly cut off from a number of ICT-mediated social interactions that can lead to stagnation, slow down the growth of well-being, reduce access to education and self-education, thus closing the circle of what is now commonly called the term "digital inequality".

In addition, digitalization, like any emergence and introduction of new technologies, inevitably entails a period of disparity between increased opportunities and social norms that do not immediately have time to adapt to these opportunities (Buttarelli, 2017; Konkolewsky, 2017; Voinikanis, 2015). The so-called effect of a "cultural lag" or delay has been known in sociological studies for a long time, characterizing the lag in social and cultural norms in the conditions of rapid technical and economic progress. Not by accident, by the way, the above-mentioned term was introduced by Ogbourne in the 1920s, when the described effect became noticeable for then the young scientific sociology. Over the past few hundred years, the role of this effect has increased, both for individual countries and for the world community as a whole.

4. Conclusions and recommendations

At the moment it is becoming obvious that for the further development of the digital economy, institutional changes in the management of science and innovation are needed. This is, first of all, the development of state bodies and organizations that are able to be effectively, consistently and purposefully engaged in administration in this area. Secondly, as our assumptions have shown, it is necessary to increase both public and private financing in the development of the ICT sector, which includes scientific and technological development, without which innovations in the modern

world are simply impossible. Finally, it is necessary to train both specialized ICT specialists and ordinary citizens. Both groups develop the digital economy by their involvement in it as users and consumers of goods and services created on the basis of new technologies. And the point here is not only about increasing purchasing power, but also about the introduction of ICT in people's daily lives. Here it could be argued that the latter is happening of itself and even expodentially, but these processes are, in many ways, still unstructured, forcing organizations to constantly catch up with the development of digital technologies, rather than to foresee and supervise it (Saksonova and Kuzmina -Merlino, 2017).

The above-mentioned goals, in our opinion, require holistic, consistent strategies, which can be formulated only if we understand the socio-economic development of society in a comprehensive manner. It should also include understanding of the emerging values and ideological systems, on which mass behavior patterns will be built in the future. As in any emerging system of relations, processes of norm development are parallel to each other and sometimes are quite contradictory in the digital reality with its numerous and multifaceted communities. These norms are both legislative regulation and the notion of personal responsibility of operating actors. Shifts in perception of the world promote in their turn the introduction of new technologies in the public consciousness at the level of the way of life, which determines the methods of decision-making by subjects in the economic sphere. The influence of economic and socio-cultural practices, especially in today's very rapidly changing reality, must be viewed in a single complex. It is even more important if we want to be able to predict the consequences of current processes.

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