The European Proceedings of
Social & Behavioural Sciences
EpSBS

Future Academy

ISSN: 2357-1330

https://dx.doi.org/10.15405/epsbs.2019.03.27

GCPMED 2018
International Scientific Conference "Global Challenges and Prospects of the Modern Economic Development"

DIGITAL ECONOMY AS A SOCIAL PHENOMENON: ETHICAL CHALLENGES AND PERSPECTIVES OF DEVELOPMENT

A.V. Guryanova (a)*, T.V. Korotaeva (a), G.A. Chedzhemov (a)
*Corresponding author

(a) Samara State University of Economics, Soviet Army Str., 141, 443090, Samara, Russia, e-mail: ecun@sseu.ru

Abstract

The article analyzes phenomenon of the digital economy. The uncertainty of this concept and the basic conceptions of the digital economy are also considered. Digitalization of the modern economy is interpreted as a large-scale social process determining not only economic and technological innovations, but a new paradigm of development with a complex qualitative transformation of economy, society and the human being. Ethical challenges and risks of the modern digital economy are selected and analyzed in the aspect of their influence on human existence, social life and global environment. Among them there are such problems as a reduction of jobs, rising inequality in wages, changes of moral norms and confidentiality boundaries, unethical use of the digital achievements, opportunity of the total control system and the danger of mechanisms out of control. It is concluded that only in the case of the positive resolution of all these problems the digital economy will develop along the progressive way. And the modern society in its turn will be able to respond in a timely manner to the actual socio-ethical risks and challenges. Digitalization simplifies communication between people and countries, raises the quality of social services and productivity of labor, creates new opportunities for business activity and employment, education process and continuous improvement of professional qualifications. Digitalization accompanies the socially important scientific researches and thereby reduces the risks of climate change, lack of drinking water, food, energy, etc.

Keywords: Digital economy, digitalization, digital revolution, digital society, humans, socio-ethical problems.

https://dx.doi.org/10.15405/epsbs.2019.03.27
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Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

1.1. «Digital economy»: an appearance of the concept

An appearance of the digital economy is a natural reaction to the large-scale technological changes taking place in the modern world. It was a few decades ago when the world has entered the digital age. So, the digital revolution has started. Information and communication technologies have developed rapidly from the beginning of the twentieth century, changing the traditional way of human's life, causing the formation of new industries and professions. Of course, such changes could not pass by the economic sphere. The development of economic relations in the conditions of competitive environment between different countries and manufacturers, the need to lower the cost of goods and services, the importance for the use of innovative technologies have created a new phenomenon. And it has got a name that fixed correctly an essence of the occurring changes. The first thing that must be mentioned about this concept is that it has accented effectively the determining impact of the Internet and mobile communications on the sphere of economic relations. Recognition of their priority just caused an appearance of such a phenomenon as the «digital economy».

1.2. Digital economy by N. Negroponte

One of the authors of this concept is an American computer scientist from the University of Massachusetts Nicholas Negroponte. With a help of this term he explained the advantages of the «new» economy in comparison with its traditional version. The «old» economy has been overcome for a reason of the intensive development of information and communication technologies. The «new» digital economy involves the transition from the movement and processing of atoms that make up the matter of physical substances to the movement and processing of bits that make up the matter of program codes. Nicholas Negroponte pointed out that the traditional material substances such as raw materials and products have significant disadvantages. These are the physical weight of the products, the need for resources for their production, the use of space for their storage and problems connected with their transportation.

Therefore, Nicholas Negroponte confronts the traditional economic concepts of «raw materials» and «transport» with a concept of «virtuality» associated with an absence of weight of the products. The advantages of the digital economy, considered as a principally «new» type of economic relations, are the same: an absence of physical weight of the product, replaced by information volume; lower costs of resources for the production of electronic goods; significantly smaller area occupied by the products (usually electronic media); possibility of the quick global movement of products by the Internet (Negroponte, 1995).

1.3. Digital economy by D. Tapscott

Another author of the term «digital economy» is a Canadian economist Don Tapscott – a famous specialist in the field of digital technologies. In 1995 Don Tapscott published his book «The Digital Economy: Promise and Peril in The Age of Networked Intelligence» (Tapscott, 1995). In this book he gave an exact definition of the «digital economy»: it is an economy based on the use of information computer technology. Analyzing the evolution of high technologies, Don Tapscott identified 10 main

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positions, which form together an information basis of the new economy. Among them there are the transition from analog technics to digital technology, from semiconductors to microprocessors, from centralized computing to the client-server architecture, from the separate existence of data, text, image and sound to multimedia, from specialized systems to open systems, etc. Extrapolation of all these trends creates real conditions for electronic community formation and demonstrates an inevitable character of the ongoing transformations.

Tapscott (1995) also describes an evolution of highly developed countries and points the main features of this «new society». They include: focus on knowledge, digital form of objects' representation, virtualization of production, innovative character, integration, convergence, dynamism, globalization, transformation of the relations between the manufacturer and the consumer, exclusion of intermediaries etc. According to Tapscott (1995), exclusion of intermediaries that played an important role in the pre-electronic economy is inevitable. Because in the digital society the manufacturers are able to interact themselves with the potential customers, making their own websites where they advertise the goods they produce. Consumers only benefit from this, as they are able to book tickets and hotel rooms or buy goods on the servers of airlines, hotels or e-shops themselves, without any intermediaries. In this case no estate firms, travel agencies and other intermediary organizations are needed.

1.4. The current state of the digital economy

It's significant that most of the hypotheses presented by Don Tapscott in 1995 have already been realized in practice. The scientist payed special attention to this fact in the last edition of his book related to its twentieth anniversary (Tapscott, 2014). For example, constantly updated multimedia news web-portals have become a daily reality of the modern Internet. The problems of security are really very serious nowadays. That's why all sites containing the private information are protected in one or another way. However, some of Don Tapscott's hypotheses haven't yet become true. For example, it's the death of TV that the scientist dated to the end of the twentieth century. Or the radical transformation of advertising in the Network that must become extremely exact and highly professional in presenting information.

In general, the forecasts of the first theorists of the digital economy have become true. The modern digital economy is a real economy of innovations. Its development depends much on the effective use of the new technologies. The number of Internet users is growing exponentially in such an economy, information and computer technologies change much the human lives. All these transformations concern the global economic system too – the capabilities of consumers, the structure of industries, the role of the state system, etc. (Manyika et al., 2016). Traditional economic postulates united with the digital technologies manifest themselves in a new way, acquire a new content (Betelin, 2018). Under the influence of scientific, technical and economic progress there are significant changes in the seemingly canonic rules of the market economy, in the rules of doing business, in new manifestations of traditional economic principles and laws (Guryanova et al., 2018). There are also many problems including social, ethical (Davisson & Booth, 2017) and moral (Shestakov et al., 2017) aspects of human integration in the field of the digital economy.

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2. Problem Statement

2.1. The problem of the uncertainty of the concept «digital economy»

The first problem connected with the phenomenon of the digital economy is the uncertainty of the concept itself. To understand what the digital economy is, it's necessary first of all to cite the definition of the «normal» («not digital») economy. It is an economic activity of the society and also a set of relations taking place in the system of production, distribution, exchange and consumption. Strictly speaking using of the computers, the Internet and mobile phones can already be considered as a form of «consumption». Therefore, the digital economy can be defined as a part of economic relations that are mediated by the Internet, cellular network and ICT. Digital economy is an economic activity based on the digital computer technologies and on the new methods of generation, processing, storing and transmission of the data.

Today the term of the «digital economy» is very popular all over the world. It is actively used in the everyday life, by common people, scientists, politicians, journalists and businessmen. However, there is no single summarizing definition of the digital economy. At the same time, it offers a wide variety of interpretations. For example, «the digital economy is a set of economic relations concerning production, distribution, exchange and consumption of goods and services of a techno-digital form of existence» (Zubarev, 2017, p. 179). Or «digital (electronic) economy is an economy characterized by the maximal satisfaction of the needs of all its participants by the way of using information, including personal» (Keshelava, 2017, p. 12). And even such a one: «...it is an economy that exists in a hybrid world», which means in its tern «the result of connection of the real and virtual worlds» (Keshelava, 2017, p. 6).

2.2. The problem of the social essence of the digital economy

The variety of available definitions makes us trying to concretize the concept of «digital economy». As we have already mentioned this concept and the basic conceptions of the digital economy appeared in the late twentieth century. At that time, they were primarily associated with an intensive development of information and communication technologies. It's obvious that development of the Internet and mobile communications are the basic technologies of the digital economy. That's why the digital economy was defined in the following way in the «Strategy of information society development in the Russian Federation for the years 2017-2030»: it is an «economic activity, with a key factor of production in the form of the digital data, processing of large volumes and using the results of this analysis, in comparison with traditional forms of management, that can significantly raise the efficiency of various types of production, technologies, equipment, storage, sale, delivery of goods and services» (Strategy of information society development in the Russian Federation for the years 2017-2030, 2017). This definition focuses on the importance of digital information (digital data) for the modern economy. However, this is not enough for its full interpretation.

In fact, the digital economy is not only a new economic system. Digitalization of the modern economy includes not only the changes of economic structure and traditional markets, but also the transformation of social relations due to the increasing influence of digital technologies on them. In other words, when we analyze the phenomenon of the digital economy, we must necessarily pay attention to its social essence. This tendency is already traced in a number of normative and analytical documents. For example, the experts of the World Bank define the digital economy as a system of economic, social and

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cultural relations based on the use of the digital information and communication technologies (World development report, 2016). A similar interpretation accenting the social essence of the digital economy is presented in the «Program of digital economy development in the Russian Federation until 2035». It's given the following definition here: «Digital (electronic) economy is a set of social relations that are formed by using electronic technologies, electronic infrastructure and services, technologies for analyzing Big Data and forecasting in order to optimize production, distribution, exchange, consumption and increase the level of socio-economic development of the country» (Program of digital economy development in the Russian Federation until 2035, 2017, p. 9-10).

3. Research Questions

The main research questions for the present study are:

- What is the social essence of the digital economy?
- Are the modern humans ready for the digital changes?
- What social and ethical problems are connected with the digital economy's development?
- What are the perspectives of solution of the mentioned socio-ethical problems?

4. Purpose of the Study

This study is intended to solve the following problems:

- To characterize the digital economy as a large-scaled social phenomenon, covering not only an area of economic relations and technological innovations, but also the humans and the society as a whole.
- To identify the mechanisms of human's adaptation to the digital economy.
- To find out and to systematize the social and ethical problems arising on the path of development of the digital economy.
- To measure the perspectives of digital economy's development from the point of view of its social and ethical problems.

5. Research Methods

5.1. Information and descriptive methods

Information method is used to study the digital economy as a social phenomenon having an important social essence. This method is productive for the search of the necessary information about the subject of our research interest. Descriptive method is used to describe the special characters of the new, socially oriented model of the digital economy.

5.2. System, structural and functional methods

System method is used to identify various aspects of digitalization in their interdependence as the elements of the united economic system. Structural and functional methods help to find out the features of organization and functioning of the digital economy as a complex social and human-sized system.

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5.3. Comparative and axiological methods

Comparative method is used to correlate the basic characters of the digital economy with its «normal» («not digital») type. This method is also used to compare current optimistic and pessimistic forecasts of the future development of the digital economy. With a help of the axiological method these forecasts are evaluated objectively.

5.4. Dialectical method

Dialectical method is used to consider the dynamics, features of transformation and the relations between the phenomena of digitalization, economy, society and a human being. It gives an opportunity to present all these phenomena in their interrelation, taking in view causal connections between economic and anthropological, social and ethical tendencies and processes, to make an analytical vision of all these tendencies.

5.5. Methods of classification and typology, analysis and synthesis

Methods of classification and typology are used to identify and to organize social and ethical problems arising in the process of human integration into the field of the digital economy. Methods of analysis and synthesis are adapted for concretization and subsequent generalization of the related ethical challenges.

5.6. Prognostic and modeling methods

Prognostic method is used to consider the perspectives of development of the digital economy, which are directly connected with the solution of its social and ethical problems. The last ones are important for the development of the human civilization in general. The modeling method is used to create a certain vision of the great changes of the future digital civilization.

6. Findings

6.1. Digital economy as a result of the fourth industrial revolution

The global digital changes taking place in the modern world are often called «the point of non-return» (Aptekman et al., 2017, p. 11) or the «fourth industrial revolution» (Schwab, 2017). It was announced by Klaus Schwab – a famous economist, founder and Executive Director of the World economic forum in Davos. Revolution, wherever it happens (in political, social, cultural, scientific, religious spheres), always involves a quick, radical change. Schwab (2017) writes in his book «The Fourth industrial revolution» that the first of them took place in 1760-1840s. It was caused by an invention of the steam machine. The second industrial revolution dates from the end of XIX – beginning of the XX century. It was determined by the spread of an incandescent lamp, electricity and conveyor manufacturing. The third industrial revolution happened in 1960-ies of the XX century. It was caused by the spread of semiconductors. The fourth industrial revolution falls immediately on our days.

Today the industry all over the world is going through the real revolutionary changes. The scale, volume and complexity of this fourth industrial revolution have no analogues in human history. The three previous revolutions were driven solely by an emergence of new technologies. The fourth differs much

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from them because of the speed of technology diffusion and the global character of its dissemination and application. The fourth industrial revolution is fundamentally changing the traditional way of human life. We are witnessing significant technological innovations in a wide range of areas – artificial intelligence, robotization, 3D printing, nano- and biotechnology, etc. At the same time, the fourth industrial revolution with its innovative technologies causes many problems, especially in the social and ethical fields.

6.2. The perspectives for the digital economy development

Therefore, the perspectives for the digital economy development get different reviews today. They range from very optimistic to categorically pessimistic. Optimists think that «…the digital economy can be a tool that will realize the centuries-old dream of freedom of the people who are doomed to a hard-physical labor today. The widest opportunities for creativity, science and art activities will be opened» (Keshelava, 2017, p. 5). In their turn the pessimists are sure that digitalization transforms the human from the subject of public relations to an object of strict state manipulation. In this case he becomes equivalent to the product, losing his freedom and possibility of choice. So, digitization is a global project whose goal is to construct a new slave society that is managed through the use of information and communication technologies (Filimonov, 2018).

In our opinion both of these positions are extreme. Expressing unreasonable emotionality in the question of digitalization consequences is unacceptable. To form a correct view on the essence of the digital economy and to realize its proper strategic planning it's necessary to analyze this phenomenon objectively. Digitalization (it doesn't matter how to treat it) is a reality of nowadays: humanity in general and particularly Russia have already entered the era of global digital changes. The new digital technologies contain a great potential for development, but they also include great risks. In order to overcome them it's necessary to take in view the human factor, to solve the socio-ethical problems arising in the process of digitalization.

The question about the consequences (positive or negative) of the digital economy development is related closely to the human – its direct participant and implementer: is he ready for the changes that are taking place? Human nature changes slowly, but the world transforms very quickly under the influence of the progress in microelectronics, information technologies and telecommunications. In the nearest future all main spheres of human life – economics and management, science and security – will get a new form and content. The human himself will becomes the different one (Guryanova et al., 2018). And it will inevitably transform the system of social relations and ethical principles (Shestakov et al., 2017). All these changes must be deeply analyzed. They need assessment, planning and effective regulation. In this case consideration of social and ethical problems of human integration in the realities of the digital economy is very actual and important.

6.3. Ethical problems of the digital economy

The development of the digital economy generates ethical challenges and risks in the following aspects:

- Ethical problems connected with human existence;
- Ethical problems connected with social life;

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- Ethical problems connected with global environment.
- Let's consider them in this order.

6.4. Ethical problems connected with human existence

First of all, it's necessary to mention a special problem of interaction within the system «human / machine» that changes ethical norms and values of the professional activity and in the sphere of «producer / consumer of services». There are many social and ethical problems between the people when they are using different kinds of technical intermediaries in the process of communication. These are the problems of personal relations, social networking, professional ethics in the sphere of the distance medical services provision, education, legal assistance, etc.

The problems of responsibility of the autonomous intelligent technologies are also very actual. They are connected with a special «machine morality». The most important of them is a problem of fair responsibility distribution between the creator, the user and the machine. It's also necessary to set ethical boundaries of the «moral machines» possible using and the trust level to them. Potential ethical risks may also include a danger of automatic systems out of control. Nowadays this scenery seems rather fantastic but the fact is that computer errors are quite real in our days. At the worst development of the circumstances that can even cause technogenic catastrophes.

One of the main ethical problems connected with human existence in the modern digital world is a problem of ubiquitous robotization. In the nearest future robots will take care of patients, do the shopping delivery, help us in agriculture and infrastructure and provide many other important services. The Bots guided by terabytes of data will help to automatize business and education processes, to modernize the service sector. All these functions and roles were traditionally played by the humans themselves. Thus, robotization can cause an increase in unemployment. It will lead to affecting changes in the labor market, to reduction and even disappearance of a number of professions in a short time period.

If most of the professional responsibilities are transferred to automated self-learning systems, this can cause radical changes in moral norms of human behavior. The last one experiences a strong impact of the widespread and accessible information about the activities of social and political structures, institutions, commercial companies, etc. This changes the boundaries of confidentiality in the professional and private spheres, up to disappearance of the privacy itself.

6.5. Ethical problems connected with social life

Digital technologies transform much the social relations between people and their job too. Freelancing is very successful today as it is based on the access to online markets and collaboration. Businessmen achieve rapid innovations using digital technologies such as 3D printing or Big Data. Over the next few years these trends will change the structure and the main principles of the job as a whole. Certainly, some participants of the new economic relations will get new opportunities and use them successfully. But the other ones who are not able to stand the competition in the digital economy will be doomed to failure or economic insecurity.

Among the ethical problems connected with social life it's necessary to mention an absence of equity in access to the achievements of the digital revolution. It leads to appearance of the new forms of

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discrimination or to the revival of the old ones. These trends, without paying due attention to them, may become grounds for risks of the social inequality increasing and the growth of social tension. Social problems of unethical using of the digital revolution achievements are very important in the digital society. Personal information has become practically public in our days. So, it can be used unethically for different commercial or political manipulations realized by individuals or social groups. The risks of the privacy violation and the creation of the state total control systems are extremely great.

Spheres of education, science, research, culture and the media are the main areas of the new digital achievements' implementation. They are themselves the most important factors contributing to the further development of the digital technologies. They both include great opportunities that manifest themselves in the above-mentioned fields of education, professional development, continuing education (Pecherskaya et al., 2016), development and participation in economic and social life (Pecherskaya et al., 2016). Despite this, the problems of human adaptation to the challenges of the digital economy are still actual. They relate to the continuous improvement of skills and the development of new skills suitable for the space of the digital economy (Pecherskaya et al., 2018). In this regard, active state policy in the labor market, maintaining the level of people's wellness, the system of continuous training and more dynamic education system are extremely important.

6.6. Ethical problems connected with global environment

Ethical problems connected with global environment (Pechurkin & Somova, 2014) are also variative. These are for example the problems with food and water shortages. By 2045, 3.9 billion people – more than 40% of the world's population – may face problems of access to water resources (Program of digital economy development in the Russian Federation until 2035, 2017, p. 30). To some extent, this problem can be solved by desalination, micro-irrigation, water re-cultivation, rainwater harvesting and other technologies. Genetically modified crops and automatization can increase crop yields and allow agricultural producers to make more food by using less land. Food and water, perceived by humanity as obvious for a long time, will become the focus of innovation and competition.

The problem of the climate change also includes an ethical component. The global surface temperature of the Earth is rising. Taking into account the negative anthropogenic impact on the climate (Akaev, 2017), the warming is inevitable. As a result, the sea level will rise, and the coastal cities will be threatened. Crop yields can fall down, and this will lead to famine in some parts of the world. Millions of people will suffer from the lack of fresh water. Flooding can destroy living houses and public infrastructure. Over the next 30 years, these risks will drive investments in technology solutions impacting the climate change.

For thousands of years people have realized selection and hybridization. However, the development of modern science has made it possible to create genetically modified crops and animal species. And this is just the very beginning. Now we are on the threshold of a new genetic revolution. Over the next 30 years, synthetic biology will create new organisms that'll be able to find toxins, to create biofuels from industrial waste, to make drugs through symbiosis with humans (Program of digital economy development in the Russian Federation until 2035, 2017, p. 31), etc. At the same time, synthetic

biology includes serious risks related with artificial biological weapons and invasive synthetic organisms, which can destroy natural ecosystems.

7. Conclusion

Development of the digital economy generates various ethical challenges and risks in the areas of human existence, social life and global environment. The growth of investments in digital technologies lead to the reduction of jobs and rising inequality in wages. Digitalization causes social and ethical problems between people and machines. It changes the moral norms of human behavior and the boundaries of confidentiality. In conditions of the digital economy the problems of unethical using of the achievements of the digital revolution, the risks of the total control system appearance and the danger of automatic mechanisms out of control are formed. All these ethical challenges require their theoretical consideration in forecasting the perspectives of the digital economy and the modern society as a whole. Only in the case of their successful solution digitalization of the economy can help to solve the increasing social and global problems.

Digitalization simplifies communication between people and countries, raises the quality of social services and productivity of labor, creates new opportunities for business activity and employment, education process and continuous improvement of professional qualifications. Digitalization accompanies the socially important scientific researches and thereby reduces the risks of climate change, lack of drinking water, food, energy, etc. Thus, digital innovations are an important lever of economic development. They offer progressive solutions to global problems, increase the efficiency of management decisions and stimulate the active participation of business in the formation of the economic wellbeing of the countries.

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