

Digital Economy as a Factor of Increasing the Socio and Economic Sustainability of Rural Territories

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Abstract—The paper presents the justification of the digital economy as a factor of increasing socio-economic stability (sustainability) of rural areas. The levels and stages of the digital economy formation are determined. The author gives an explanation of the concepts of sustainable development and digital economy. The factors influencing the development of digitalization population’s vital activity are designated. The data on the provision of digital technologies in Russia as a whole are presented. A list of characteristics of the digital economy to assess the stability of the territories is proposed. Emphasis is made on a significant lag in the pace of implementation of digitalization in the spheres of life of the rural population. The main reasons for the refusal to use the Internet by the rural population are: lack of interest in the use of the Internet (22 %); lack of sufficient knowledge and skills to use the Internet (8.9 %); high cost of Internet connection (5.9 %); lack of technical ability to conduct the Internet (4.1 %). The introduction of digital technologies in rural areas and the formation of digital competencies in rural areas will reduce information inequality among residents of cities and villages and improve the quality of life of the population, which will be expressed by increasing the level of employment and education of the rural population, reducing transaction costs, increasing the level of information support and involvement of rural areas in the world community, improving the environmental situation, improving the quality of social relations.

Keywords—sustainable development, digital economy, innovations, rural areas, socio-economic development, digitalization

I. INTRODUCTION

Sustainable economic development of the territory is a process of economic development of a territorial entity, mandatory and integral conditions of which are: account the stability of the social sphere, with respect to the interests of all segments of society; respect for the cultural sphere, involving the preservation of the inherent cultural and historical heritage; acceptable interference in the sphere of ecology, accompanied by the preservation of its reliable state and allowing to ensure the safety of life of individuals at the moment and in the future. Applying this concept in the context of rural development, the authors made some clarifications, given the huge gap between urban and rural areas, as well as the post-industrial nature of modern society, that is, the age of communications and information

technology, namely the development of innovation in rural areas.

It should be noted that the innovative component for the city and for the rural area is not the same. The development of innovation in rural areas involves, first of all, the creation of conditions for the use of information resources and increase the level of information security of the rural population. For example, the improvement of telephone channels, mobile network lines, Internet lines, which will contribute to the development of the involvement of the rural population in the world community.

The purpose of the study is to substantiate the digital economy as a factor of sustainable socio-economic development of rural areas.

The object of study – rural areas of the Chelyabinsk region. The subject of the research is the relations developing in the formation of the digital economy between institutions in rural areas.

The scientific novelty of the research consists in the development of methodological provisions and characteristics of the tools of the digital economy as one of the determining factors in improving the socio-economic stability of rural areas.

II. LITERATURE REVIEW

A large number of works of domestic and foreign researchers are devoted to the problem of digitalization of the economy. In particular, the issues of management of territorial formations in the conditions of penetration of the digital economy in the sphere of the society are reflected in the works of Ogorodnikov P. I., Zaloznaya G. M., Borovsky A. S. [1], Dyatlov S. A., Lobanov O. S., Zhou W. V. [2], Nissen V., Lezina T., Saltan A. [3], Sadovaya E. S. [4], Golova I. M., Sukhovey A. F. [5]. The problems related to the functioning of the agricultural sector in the conditions of transition to the digital economy were: Skvortsov E. A., Skvortsova E. G., Sandu I. S., Iovlev G. A. [6], Altukhov A. I., Drokin V. V., Zhuravlev A. S. [7], Strochenko N. I., Koblianska I. I. [8]. However, the problem of digitalization of life support in rural areas is not sufficiently investigated, in addition, given the strategic importance of rural development for the state as a whole, we consider the chosen topic to be reasonably relevant.

III. RESEARCH METODOLOGY

Digitalization of life support, in our opinion, is the introduction of digital technologies in all spheres of society in order to improve the quality and living standard of the population. There are primary and secondary levels of digitalization. The first level is the formation and provision of appropriate infrastructure. Quite popular and often occurring name of this level-informatization of life. The second level includes a deeper penetration of digital technologies in the spheres of society, accompanied by the formation of digital competencies, which involves intensive and regular use of digital services in solving any problems arising in the population.

Levels of digitalization can be represented in the form of stages of formation of an effectively functioning digital economy, where the beginning is laid in the creation of

digital infrastructure and fixed by the use of digital services in everyday life, and then the result of this process is the formation of digital competencies of the population, which consists in the competent use of all the possibilities of digital technologies, which will contribute to the rationalization of the way of life of individuals.

Thus, digitalization is one of the stages in the formation of the digital economy of territorial education, which, in turn, represents a system of socio-economic, industrial, spiritual relations based on the introduction of digital opportunities. In other words, affecting all spheres of society, the digital economy is based on the provision of a comprehensive digital space. As a rule, the main services of the digital economy are all kinds of services related to the search for information, payment, savings, training, leisure, purchase and sale of goods and other things that can be obtained remotely, thereby reducing transaction costs.

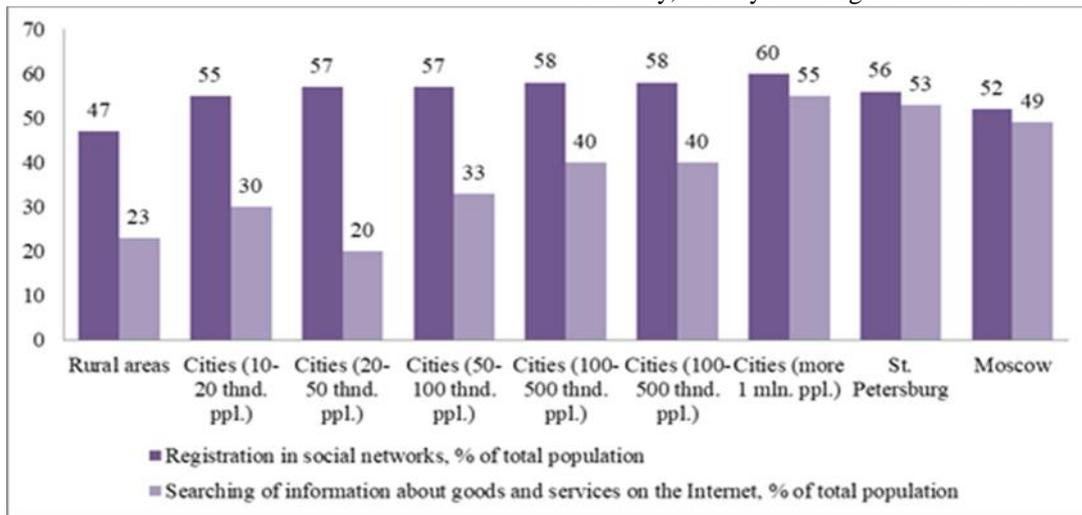


Fig. 1. Functional using of the Internet by residents of various territorial entities in 2017.

According to the results of research conducted by the Federal State Statistics Service, a change was detected in the activity of residents of territorially diverse populations in using the Internet functionality. Thus, the share of the rural population registered in social networks makes up 47 % of the total population of rural areas, in large cities this figure reaches 60 %. Information about goods and services on the

Internet is obtained by 23 % of rural residents, while in large cities over 50 % of residents receive interesting information on the network (Fig. 1). We also note that in urban residents more often than residents of villages and small towns, the Internet services used to pay for housing and medical services (Fig. 2).

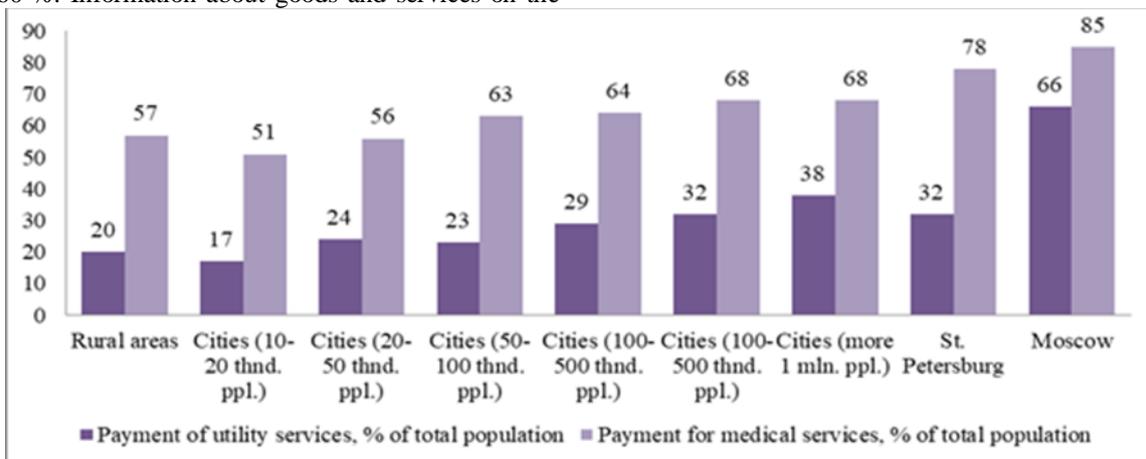


Fig. 2. Consumption of services through the use of the Internet by residents of various territorial entities in 2017.

Given the above, the digital economy can rightly be considered one of the most important factors in improving

the sustainability of socio-economic development of a territorial entity, from large metropolitan areas to rural areas.

The formation of the digital economy helps to increase employment, increase the level of education and improve the quality of human resources, reduce costs and time spent, increase the level of information support and involvement in the world community, improve the environmental situation, increase the size and quality of social relations, improve the welfare of the population as a whole.

During the study, the factors of formation and development of the digital economy were divided into two groups: territorial and personal. The first group includes the type of territorial formation and the level of socio-economic development of the territory. There is a two-way link between sustainability and digitalization. The group of

personal factors include the level of education, income, and age of potential users of digital services.

Based on the analysis of statistical data, Russia as a whole is a group of leaders in the development of the digital economy. In particular, 74 % of the country's population has Internet access, while in Western and Eastern Europe this figure is 90 % and 74 %, respectively, and the global average is 53 % of the population. Mobile network connectivity is 112 % of Russian citizens, and the world average is 112 %. Mobile Internet is used by 98 % of the country's population, which is similar to the value of this indicator in Western Europe, and the global average is 63 % (Table I).

TABLE I. PROVISION OF DIGITAL TECHNOLOGIES OF THE POPULATION OF RUSSIA AND THE WORLD SPACE

Indicator	World average	Western Europe	Eastern Europe	Russia
Share of the population provided with Internet access, %	53	90	74	74
Share of the population provided by the connection to the mobile network, %	112	119	157	176
Share of population involved in social networks, %	42	54	45	47
Share of the population provided with Internet access via mobile connection, %	63	98	92	98
Share of population using mobile social networks, %	39	44	37	39

In rural areas, the pace of development of the digital economy and digitalization of life support is much lower. According to the results of the study of families living in rural areas, for the use of information technology revealed that provided with personal computers only 62.6 % of the

number of respondents surveyed, access to the Internet have 66.5 %, of them access from a personal computer provided 56.3%, broadband Internet access provided 59.6 % of families (according to the Federal State Statistics Service) (Table II).

TABLE II. THE USING OF DIGITAL TECHNOLOGIES AND INFORMATION AND TELECOMMUNICATION NETWORKS IN THE RUSSIAN FEDERATION BY TYPE OF SETTLEMENT AND IN SOME SUBJECTS

Type of territories	Number of surveyed respondents, thousand people	Share of respondents provided with:			
		a personal computer	Internet access	Internet access from a personal computer	broadband internet access
Cities and urban settlements	41 762.4	78.3	79.5	74.8	76.8
Rural areas	13 605.2	62.6	66.5	56.3	59.6
Russian Federation	55 367.6	74.4	76.3	70.3	72.6
Ural federal district	4 750.0	73.8	75.6	70.0	73.6
Kurgan region	370.7	62.0	67.0	57.8	62.3
Sverdlovsk region	1 739.1	69.0	71.6	65.5	70.5
Tyumen region, including:	1 241.6	84.9	85.3	80.4	82.9
Khanty-Mansiysk aut. district	546.9	89.5	90.5	84.0	87.0
Yamalo-Nenets aut. district	186.5	94.7	95.3	92.9	93.3
Tyumen region without aut. counties	508.2	76.3	76.1	72.1	74.7
Chelyabinsk region	1 398.6	72.9	74.3	69.7	72.1

Various devices are used for access to the Internet, for example, stationary computers, laptops, tablet devices, mobile phones, game consoles, TVs of the new generation. According to the results of research and official statistics, the most popular Internet access devices in Russia are mobile

phones (56% of respondents), stationary computers and portable devices (laptops, netbooks) are in second place, tablet devices are in third place. For rural residents mobile phones and personal computers are also the most popular devices (Table III).

TABLE III. TYPES OF DEVICES USED TO ACCESS THE INTERNET IN THE RUSSIAN FEDERATION BY TYPES OF SETTLEMENTS AND IN SOME SUBJECTS

Type of territories	Stationary computers	Portable computers (laptops, netbooks)	Tablet computers	Mobile devices (mobile phones, smartphones, devices for reading electronic books, etc.)	Video game consoles	TVs with a special device (Smart TV)
Cities and urban settlements	43.6	44.2	30.1	59.8	3.3	9.1
Rural areas	31.5	29.6	16.8	44.3	1.3	4.1
Russian Federation	40.6	40.6	26.8	56.0	2.8	7.8
Ural federal district	38.9	42.3	26.2	57.1	2.2	9.0
Kurgan region	35.7	28.7	12.5	45.1	0.9	3.0
Sverdlovsk region	38.4	36.5	25.2	56.7	2.0	5.1
Tyumen region, including:	44.1	57.1	31.4	63.7	2.6	12.1
Khanty-Mansiysk aut. district	36.2	57.8	38.3	66.9	3.6	17.2
Yamalo-Nenets aut. district	54.0	68.7	58.6	71.6	5.3	16.9
Tyumen region without aut. counties	49.0	52.1	14.0	57.4	0.6	4.9
Chelyabinsk region	35.8	40.1	26.6	55.0	2.4	12.6

A study was also conducted on the reasons for the refusal to use the Internet. According to the results of the study, the most popular reasons were the following: lack of interest in the use of the Internet (22 %); lack of sufficient knowledge

and skills to use the Internet (8.9 %); high cost of Internet connection (5.9 %); no technical ability to conduct the Internet (4.1 %) (Table IV).

TABLE IV. THE MAIN REASONS FOR NOT USING THE INTERNET IN THE RUSSIAN FEDERATION BY TYPES OF SETTLEMENTS AND IN SOME SUBJECTS

Type of territories	Availability of Internet access in other places (at work, friends, acquaintances, in public places)	Lack of interest in using the Internet	The high cost of connecting to the Internet	Lack of knowledge and skills to use the Internet	There is no technical possibility for the Internet	In order to ensure the security and confidentiality of personal data	Other reasons
Cities and urban settlements	1.7	14.9	3.8	5.6	0.6	0.2	2.1
Rural areas	1.8	22.0	5.9	8.9	4.1	0.2	3.6
Russian Federation	1.7	16.7	4.3	6.4	1.5	0.2	2.5
Ural federal district	1.3	18.8	3.8	6.6	1.6	0.2	1.8
Kurgan region	0.9	25.0	3.5	5.7	2.4	0.4	3.2
Sverdlovsk region	0.9	23.1	3.4	6.6	1.6	0.1	1.5
Tyumen region, including:	1.1	9.9	3.8	6.2	1.1	0.2	1.6
Khanty-Mansiysk aut. district	0.8	5.5	2.6	3.3	0.8	-	1.1
Yamalo-Nenets aut. district	1.3	3.0	0.8	2.0	-	-	1.0
Tyumen region without aut. counties	1.3	17.2	6.3	10.8	1.9	0.5	2.4
Chelyabinsk region	2.0	19.7	4.4	7.2	1.7	0.2	1.9

Analyzing the modern approaches to the establishment of the factors of the digital economy that affect the socio-economic sustainability of rural areas, the authors propose a methodological approach based on the account of the set of characteristics of the digital economy indicators that affect the sustainability of rural areas (Table V).

IV. CONCLUSION

The proposed set of characteristics of the digital economy indicators was formed in such a way that these indicators were suitable for the calculation of official statistics, which will ensure the availability of source information, and will

also contribute to improving the reliability of research results in this area.

The proposed methodological approach to determining the tools of the digital economy as a factor of increasing socio-economic stability in rural areas can be used by regional, regional and local governments of rural settlements in the development programs for the growing of the digital economy in the territorial spaces.

TABLE V. CHARACTERISTICS OF THE DIGITAL ECONOMY INDICATORS FOR ASSESSING THE SUSTAINABILITY OF RURAL AREAS

№	Characteristics of indicators	Justification
1	Systematic	Consideration of the influence of internal and external factors and synergetic effect.
2	Target	Indicator growth results reflect the tactical and strategic objectives of the digital economy and rural sustainability.
3	Objectivity	Indicators information is available in the area of digital economy competence.
4	Expediency	Consistency and relevance of the criteria and indicators for the effective development of the digital economy in rural areas.
5	Simplicity and flexibility	The indicators are simple to calculate an increasing assessment of the rural areas' socio-economic sustainability.
6	Unification	Using of the unified information support.
7	Dynamic	Reflecting the dynamics of the digital economy in rural areas through indicators.
8	Scale	Comprehensive reflection of the digital economy's impact on improving the sustainability of rural areas.
9	Multistage	Definition of integrated indicators characterizing the main factors of the digital economy, causing increasing of rural areas' social and economic sustainability.

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