The European Proceedings of
Social & Behavioural Sciences
EpSBS

Future Academy

ISSN: 2357-1330

https://dx.doi.org/10.15405/epsbs.2019.03.16

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

SPECIFIC CHARACTER AND COMPARATIVE CHARACTERISTIC OF INFORMATIZATION OF RUSSIA'S NORTH-ARCTIC TERRITORIES

S.V. Baranov (a), T.P. Skufina (b)*, V.P. Samarina (c), A.V. Samarin (d)
*Corresponding author

(a) Federal Research Centre Kola Science Centre of the Russian Academy of Sciences, Apatity, Russia, email: bars.vl@gmail.com, +7-921-709-11-90
(b) Federal Research Centre Kola Science Centre of the Russian Academy of Sciences, Apatity, Russia, email: skufina@gmail.com, +7-921-709-13-83
(c) Voronezh Institute of Law & Economics (Stary Oskol branch), Staryy Oskol, Russia, email: samarina_vp@mail.ru, +7-915-528-01-80
(d) Belgorod State National Research University (Staryy Oskol Branch), Staryy Oskol, Russia, email: aivic_samarin@mail.ru, +7-915-528-01-80

Abstract

The paper is devoted to the identification of specificity and comparative characteristics of the informatization processes of the North-Arctic territories of the Russian Federation. The evaluation of the informatization processes in Russia's North-Arctic regions was carried out on the basis of a rating assessment method, including the use of the Maholonobis distance. The constructed ratings for the informatization level have shown that the level of informatization of Russia's North-Arctic regions is lower than the All-Russian one. On the basis of separately constructed informatization ratings for organizations and households of the North-Arctic regions of the Russia, the absence of dependence of the informatization process of organizations and the process of informatization of households has been determined. It has been determined that households are usually characterized by higher informatization in comparison with the all-Russian situation. It is a consequence of the increased informatization need in everyday life because of such special factors as peripherality, frigid climate discomfort and, at the same time, the possibility of informatization costs due to high population income in these regions. In the course of discussing the conditions and measures aimed at intensifying the processes of informatization of Russia's North-Arctic regions, it was noted that regions with similar socio-economic and geographical characteristics often differ from each other on the level of informatization very significantly. It has proved the insufficiency of the regional policy of Russia's North-Arctic regions

Keywords: Informatization, the Russian Federation, North-Arctic regions, comparative assessments, specificity, trends.

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

The urgency of revealing the specific character and comparative characteristics of the informatization processes of Russia's North-Arctic territories is determined by several facts. Firstly, every year the processes of socio-economic development of the territories are increasingly associated with the informatization processes (Dittmar, 2011). In fact, it is the level of development of informatization that becomes a kind of criteria of territorial social and economic potentials (Pradhan, Arvin, Norman, & Bele,, 2014).

Secondly, inland differentiation (the differentiation between regions of a country) in terms of socio-economic development (Skufina, Baranov, & Samarina, 2016) and informatization level can be very significant (Lam & Shiu, 2010). These disproportions may limit the realization of the economic and social development of the territorial potential (Visual Networking…). Thirdly, the object of the research is the North-Arctic territories and it generates particular urgency on the part of economy and the social sphere (Andrew, 2014; Lipsey, Carlaw, & Bekar, 2005). Thus, the informatization allows to reduce distances and some interaction costs for the economy and social sphere of these remote territories (Skufina, Samarina, Krachunov, & Savon, 2015; Baranov, Skufina, Samarina, & Shatalova, 2015).

The search for trends and specifics of the development of the informatization of Russia's North-Arctic territories in comparison with All-Russian situation determines scientific and practical significance of the research.

2. Problem Statement

The foregoing facts of the relevance of our research lead to the following problem: the contradiction between extractive character of the economy of Russia's North-Arctic territories and purposes of the formation of postindustrial factors in the development of these Russian territories (Skufina et al., 2015).

It should be noted that these purposes are synchronized with the worldwide problems of the developing northern territories of the world, which signify the need of these territories for active integration into post-industrial space. The solution of this problem requires scientific developments aimed at justifying the conditions for achieving a balance of industrial and postindustrial factors in the development of the Russia's North-Arctic territories (Healy, 2017; Baranov et al., 2015). The rationale for this balance is, furthermore, the disclosure of the specifics of the North-Arctic territories space informatization as a result of the functioning of the economy, the result of state regulation, the result of natural socio-economic transformations. Our research is aimed at solving this problem.

3. Research Questions

- The emphases of the informatization as a main subject of the indicated problem research is closely related to the informatization processes, the development of information and communication infrastructure, the level of technological development etc. and the processes of social and economic development of the territories as well (Cardona, Kretschmer, & Strobel, 2013; Commander, Harrison, & Menezes-Filho, 2011). This is reflected in numerous ratings on

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

various subjects related to technological development (ICT Development Index, IMD World Digital Competitiveness Ranking, Global Competitiveness Report, Bloomberg Innovation Index, Networked Readiness Index, etc.), analytical bulletins devoted to interstate comparisons according to the level of society involvement in the Internet space, factors and results of ICT development, web service indices (Digital Single…; World Development…).

- Further, this information is repeatedly reproduced in research papers and normative legal documents. At the same time, conclusions rightly point to positive dynamics and significant improvement in Russia's position. However, in-country differentiation according to the level of informatization can be more profound than intercountry one. At the same time, the nature of this problem at the intercountry level is fundamentally different.
- So, it is obvious that intercountry differentiation is determined first of all by global redistributions of the modern world-economy structure, that is, the influence of national government on it is minimal. The basis of this redistribution is the further consolidation of the economic and political space polarization. It is believed that unconditional progress in the development of information technology in peripheral countries is an indicator of their successful catching-up development. However, unlikely positive changes markers should be considered quantitative convergence of indicators characterizing informatization, in "catching up" countries with developed economies countries. From the economic point of view, this trend characterizes the expansion of the ICT market with the redistribution of the main geopolitical and economic effect towards developed countries (De Loecker & Goldberg, 2014; Hallward-Driemeier & Pritchett, 2015; Demirguc-Kunt, Klapper, Singer, & Van Oudheusden, 2015).
- The different situation is at the heart of intercountry differentiation in terms of informatization level. Here, this differentiation is the result of internal policy and practice of territorial government. That is, the level of differentiation is managed at the national level and, in part, even at the regional one. At the same time, the management of informatization processes is imposed on the need to eliminate such disproportions, which severely limit the realization of the potential for economic development of the territories. Consequently, the external criterion for a positive assessment of public administration is clear - the indicators of informatization (in our case, the Northern Arctic regions) should have a common vector of changes and a tendency for rapprochement.
- On the whole, it can be concluded that from the point of view of social and economic processes managing at the country level, the research of informatization processes in the regions of these countries are promising not only from the theoretical and methodological positions, but from the stands of management practice as well. In addition, they have clear and unambiguous criteria for diagnosing the situation and evaluating the results of management.
- The subjects of the research of the problem of the North-Arctic territories informatization are very wide and they give rise to many questions. It should be noted that there are questions requiring answers, without which it is impossible to answer any of the following questions: What is the informatization level of the North-Arctic regions of Russia? Is there any specific

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

character of these regions informatization? Is there a connection between household informatization and informatization of the economy in Russia's North-Arctic regions?

4. Purpose of the Study

The purpose of the research is to reveal the specifics of informatization and show the level and problems of its development in the North-Arctic territories of the Russian Federation.

Hypotheses of the research

The level of development of information and communication infrastructure in developed subpolar countries is lower than the national average one. Taking into account the phenomenon of synchronization of socio-economic processes based on the factors of low population and the remoteness of the North-Arctic territories, one can expect that the level of informatization of Russia's North-Arctic territories is low. Thus, the first hypothesis is that the level of informatization of Russia's North-Arctic regions is below All-Russian level.

It is known that there is a relationship between the level of economic development and level of social one, between the level of economic development of a certain territory and the level of informatization. Thus, the second hypothesis is that the processes of informatization of economy and informatization of households in Russia's North-Arctic regions are developing synchronously and unidirectionally.

5. Research Methods

The variety of ratings of countries and regions according to different criteria related to the informatization is made in the world. The part of ratings is based only on the statistical indicators and another part is based on the use of statistical indicators and survey results. In order to test our hypotheses it is quite enough to use only statistical indicators. As a rule, these ratings are associated with different information are so called composite index combining several indicators into one complex measure.

The process of bringing these indicators to a single index is usually based on putting down scores (places) relative to a certain (usually average) level (Dobrota, Martic, Bulajic, & Jeremic, 2015; Milenkovic, Brajovic, Milenkovic, Vukmirovic, & Jeremic, 2016). Such ratings provide clear, easily interpreted information, which is important for monitoring, comparing, contrasting events between countries and regions in the field of the informatization. The simplicity of rating building adds popularity of their use in scientific research as well. In particular, almost all comparative assessments of the levels of economic and social development, informatization of regions and municipalities in Russia are based exactly on ratings based on scores (Baranov et al., 2015). However, these methods have a number of drawbacks: they do not take into account the measure of gaps between indicators (which are included in the assessment), do not take into account the correlation of ones etc. (Baranov et al., 2015).

In order to assess the informatization of Russia's North-Arctic regions, we suggest using a technique based on the Maholonobis distance. This technique provides easily interpretable, unambiguous results and eliminates the problem of the correlation of indicators included in the complex (rating) assessment.

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Used indicators:

1) the number of personal computers per 100 employees (pieces);

2) the number of personal computers per 100 employees (pieces) with Internet access;

3) costs of computers acquisition (million rubles);

4) costs of programs acquisition (million rubles);

5) costs of employees training (million rubles);

6) expenses for service payment of third-party organizations and specialists (except for communication and training services) million roubles.

Before rating assessments calculating indicators 3) - 6) were normalized according to population size in a region in order to achieve the requirement of comparability of regional objects. It should be noted that all indicators are unidirectional, that is larger indicator value corresponds to greater informatization level.

In the technique the Makholonobis's distance is used. The Makhalonobis's distance between sets of indicators u and v characterizing various regions is determined as follows:

$$d(u,v) = \sqrt{(u-v)' S^{-1} (u-v)}, \quad (1)$$

u ; v - indicators characterizing various regions;

S^{-1} - matrix inverse calculated according to a set of the indicators characterizing Northern regions;

' - transposing operation.

In contrast to the Euclidean distance, the Mahalanobis one takes into account the correlation between indices. If the correlation between various indicators is 0 (covariance matrix is diagonal), then the expression (1) is the Euclidean distance.

When calculating rating using the Mahalanobis distance the values of all-Russian indicators were taken for the vector u in (1), and the values of the indicators characterizing a region were taken for v. At the same time, the indicators were previously divided into values characterizing All-Russian level.

In this case, the Mahalonobis distance shows the following: how much strongly one or another region deviates from All-Russian level, taking into account the correlation of the indicators values. In order to determine the best or the worst side of a region deviation, we put a sign of the rating down to the Mahalanobis distance, determined with a typical methodology of rating construction on the basis of All-Russian level scores (Table 01).

The obtained values are the rating of a region information, calculated by means the Mahalanobis distance (Table 02). This rating is more adequate than the one calculated according to scores on All-Russian average level (Table 01), as it takes into account the correlation of the indicators.

Table 01. Ratings of informatization of the North-Arctic regions for 2003-2016 calculated according to scores relative to All-Russian average level

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
The Republic of Karelia	-2.0	-4.3	-2.7	-1.8	-2.3	-0.8	-4.3	-2.2	-4.5	-3.8	-4.2	-4.0	-2.9	-4.3
The Republic of Komi	-2.2	-0.8	-0.8	-1.0	-0.3	-0.7	-2.5	-0.8	-2.5	-3.7	-4.7	-1.5	-1.3	-3.4

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Arkhangelsk Region	-4.8	-2.0	-5.8	-5.2	-3.8	-4.5	-6.0	-4.3	-1.8	-4.0	-5.0	-3.2	-3.8	-1.9
Nenets Autonomous Area	3.7	5.0	1.3	0.7	5.0	-0.5	-1.7	1.5	-1.2	0.2	-1.0	-0.9	1.0	-1.6
Murmansk region	-0.8	0.8	-1.5	1.0	-0.5	-2.0	-2.0	-2.3	-3.2	-3.2	-3.5	-2.6	-1.9	-2.1
Khanty-Mansi Autonomous Area	-1.0	3.5	1.8	1.7	2.5	0.7	-2.0	-0.5	0.3	-1.2	-1.5	-2.1	-1.0	-0.7
Yamal-Nenets Autonomous Area	1.2	0.8	0.3	-0.5	0.3	-0.7	-1.0	-0.3	0.7	0.3	-1.0	-1.1	-0.9	-0.3
The Republic of Tuva	-6.8	-5.7	-1.3	-6.7	-6.2	-7.5	-7.8	-5.2	-5.3	-6.3	-6.8	-6.7	-4.9	-4.8
The Sakha Republic (Yakutia)	1.3	2.3	1.2	-1.2	-1.0	-1.2	-3.0	-1.3	-1.8	-0.3	-2.2	-2.9	-0.9	-1.3
Kamchatka Territory	-1.5	-0.5	1.5	-0.8	-0.5	-2.7	-1.5	-0.7	-5.0	-2.8	-2.5	-1.0	-0.9	-2.8
Magadan Region	0.2	-3.3	-5.8	0.5	2.7	1.5	0.2	4.0	2.5	4.3	2.2	0.1	4.3	1.6
Sakhalin Region	2.2	1.3	-0.5	3.8	4.5	3.8	3.5	4.7	1.8	1.8	2.8	2.9	3.2	2.9
Chukotka Autonomous Area	1.3	2.8	0.7	0.2	2.0	0.5	-2.2	2.8	1.3	0.0	-0.7	-0.2	1.7	-1.8

Table 02. Ratings of informatization of the regions of the North relative to All-Russian level for 2003-2016, calculated by means technique using the Mahalanobis distance

	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
The Republic of Karelia	-1.97	-3.17	-1.96	-2.30	-1.48	-2.15	-2.09	-2.21	-2.05	-3.05	-4.38	-2.12	-2.21	-3.98
The Republic of Komi	-2.03	-1.02	-2.52	-2.40	-2.43	-2.06	-3.93	-3.20	-2.06	-1.41	-3.74	-2.91	-3.67	-3.76
Arkhangelsk Region	-1.95	-1.76	-3.03	-2.00	-2.27	-1.84	-1.79	-2.49	-2.56	-3.02	-3.77	-2.06	-1.99	-2.79
Nenets Autonomous Area	2.90	4.05	2.13	2.95	3.79	-1.82	-3.78	3.17	-3.34	2.26	-2.09	-3.01	3.06	-3.00
Murmansk Region	-1.48	1.21	-1.59	2.66	-0.77	-0.71	-1.00	-1.38	-1.16	-2.10	-2.58	-0.98	-1.87	-2.97
Khanty-Mansi Autonomous Area	-1.84	2.90	3.63	3.69	2.89	3.00	-2.50	-2.51	3.30	-3.68	-4.26	-0.40	-1.99	-0.90
Yamal-Nenets Autonomous Area	3.78	3.88	4.05	-3.86	3.61	-3.44	-3.04	-3.82	3.91	3.90	-3.89	-3.14	-3.88	-2.09
The Republic of Tuva	-2.59	-2.97	-3.53	-2.64	-3.87	-3.57	-2.59	-3.62	-2.75	-3.02	-3.71	-2.78	-2.90	-2.81
The Sakha Republic (Yakutia)	2.59	1.84	0.94	-0.94	-0.46	-0.60	-1.07	-1.39	-0.64	-2.68	-2.03	-2.12	-2.38	-2.03
Kamchatka Territory	-3.10	-2.17	1.63	-1.24	-3.02	-1.55	-2.02	-1.65	-3.10	-3.05	-2.51	-2.01	-2.66	-2.66
Magadan Region	3.47	-3.93	-2.57	1.76	3.25	3.56	3.54	3.81	2.91	3.98	4.11	4.01	3.28	2.01
Sakhalin Region	2.87	3.13	-2.39	2.20	3.66	3.69	3.13	3.02	2.04	1.36	4.46	4.03	3.00	3.11
Chukotka Autonomous Area	3.57	3.69	3.91	3.88	3.49	3.35	-2.78	2.92	4.19	0.00	-3.15	-2.69	2.97	-2.95

In 2016 the first three places in terms of informatization level were occupied by Sakhalin Oblast, Magadan region and Khanty-Mansi Autonomous Area (Table 02). High positions of these regions are explained by the following: 1) significant amounts of financing for information measures from regional budgets and the Russian Federation budget; 2) the specialization of these regions i.e. extraction and processing of natural resources, which bring high profit and therefore, enables local enterprises to invest in the development of territorial informatization.

In 2016 the last three places in terms of informatization were occupied by the Republic of Karelia, the Republic of Komi and Nenets Autonomous Area (Table 02). In many respects, this is the consequence of not only their remoteness and small population, but very weak development of information and telecommunication infrastructures as well.

It should be noted that only two North-Arctic areas (Sakhalin Region and Magadan Region) in 2016 had a level of the informatization higher than the All-Russian average one.

Let us consider the informatization of the North-Arctic regional organizations and households relative to the national level.

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

In the Russian Federation, there is an active process of statistical service improving in the direction of harmonization with world experience, as well as more accurate and comprehensive registration of various objects of statistical observation.

The improving of statistics allows us to obtain corrected characteristics of the informatization of the Russian Federation subjects. So, the Federal State Statistics Agency has been publishing new indicators characterizing regional informatization since 2011:

- use of electronic documents circulation in organizations (as a percentage of the total number of organizations surveyed in a subject of the Russian Federation);
- households having personal computers;
- households having personal computers and Internet access.

The combined use of these indicators and the indicator of ICT expenditures, rationed by the population of a region, allows the following: 1) to build informatization ratings of regional organizations and households; 2) to find out whether there is a link between informatization of organizations and households in the regions.

We will note that the obtained time series is short and does not allow to determine trends in the development of the informatization. Therefore, the ratings presented in Table 02 should be used for tracking trends.

Table 03 shows the ratings of the informatization of organizations and households of Russia's North-Arctic regions relative to the All-Russian level (explanation: the rating of organizations is the number without brackets; the rating of households is the number in brackets). The ratings are based on the foregoing method using the Mahalanobis distance.

The rating of organizations' informatization was based on the following indicators: the number of personal computers per 100 employees (pieces) and the number of personal computers per 100 employees (pieces) with Internet access.

The rating of households informatization was based on the following indicators: the percentage of households with personal computers and the percentage of households with personal computers and Internet access.

Ratings are not concerted between themselves: values of the correlation coefficients between the ratings for 2011, 2012, 2013, 2015, and 2016 are the following: 0.1; - 0.2; - 0.3; - 0.2; 0.3 and 0.1.

Thus, the informatizations of organizations and households of the North-Arctic regions are not dependent on each other. The obtained results are in agreement with the data of our previous research carried out for the territory of the Russian Federation as a whole (Baranov et al., 2015).

Table 03. The ratings of the informatization of organizations and households in the regions of the North (in parentheses) constructed using the Mahalonobis distance according to 2011-2016 data

	2011	**2012**	**2013**	**2014**	**2015**	**2016**
Russian Federation	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
The Republic of Karelia	-1.50 (1.57)	1.02 (1.30)	1.34 (1.44)	-1.02 (1.20)	1.33 (0.40)	1.04 (1.30)
The Republic of Komi	-1.42 (1.12)	-1.18 (1.04)	-1.43 (0.80)	-1.07 (1.10)	-2.01 (0.87)	-0.19 (1.04)

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Arkhangelsk Region	-2.48 (1.83)	-2.29 (1.82)	-1.39 (1.13)	-2.98 (1.76)	-1.31 (0.90)	-1.29 (1.82)
Nenets Autonomous Area	-1.60 (1.10)	-0.59 (0.00)	-0.79 (0.00)	-1.58 (0.07)	-2.00 (0.02)	-0.48 (0.10)
Murmansk Region	-0.80 (2.38)	-1.35 (2.25)	-0.70 (1.43)	-1.00 (2.88)	-0.70 (1.53)	-2.05 (2.05)
Khanty-Mansi Autonomous Area	-1.68 (2.24)	-1.50 (2.85)	-1.66 (2.39)	-0.43 (2.06)	-1.01 (3.06)	-1.65 (3.85)
Yamal-Nenets Autonomous Area	-2.74 (3.94)	-1.95 (0.75)	-2.19 (2.19)	-1.08 (0.08)	-2.55 (1.59)	-2.05 (1.12)
The Republic of Tuva	-2.13 (-2.35)	-2.18 (-2.46)	-0.97 (-2.28)	-2.99 (-2.67)	-1.08 (-2.66)	-2.07 (-2.06)
The Sakha Republic (Yakutia)	-0.40 (3.87)	-0.65 (3.35)	-0.29 (3.23)	-0.75 (3.31)	-0.66 (3.01)	-0.51 (3.45)
Kamchatka Territory	-1.96 (1.31)	1.17 (0.65)	0.98 (0.87)	1.10 (0.25)	1.90 (0.97)	1.07 (0.89)
Magadan Region	2.25 (1.39)	2.84 (-0.99)	2.88 (-0.62)	2.66 (-0.01)	1.88 (-0.02)	2.81 (-0.99)
Sakhalin Region	1.28 (0.64)	0.98 (-0.63)	1.14 (-0.76)	0.98 (-0.06)	1.45 (-0.01)	0.99 (-0.63)
Chukotka Autonomous Area	3.07 (2.04)	2.94 (0.84)	-2.49 (0.93)	2.94 (0.18)	-2.05 (0.93)	2.81 (0.84)

6. Findings

The comparative dynamics of Russia's North-Arctic regions according to the informatization level, which we have presented in the rating assessments, indicated low positions of these regions relative to the All-Russian level (Tables 01 and 02). The stability of these low positions and the frequency of manifestations in the North-Arctic regions allow us to consider this feature as a specific one of Russia's North-Arctic territories. Thus, the first hypothesis has been confirmed i.e. the level of informatization of Russia's North-Arctic regions is lower than the All-Russian one.

The ratings of the informatization of organizations and households in the North-Arctic regions have been constructed and analyzed separately. These ratings indicated that the informatization processes in these groups are independent. Thus, the second hypothesis i.e. the processes of the informatization of the economy and the informatization of households in Russia's North-Arctic regions develop synchronously and unidirectionally has not been confirmed.

7. Conclusion

The low informatization level of Russia's North-Arctic territories which have been established in the research, is explained with insufficient financing, shortage of highly qualified personnel in these remote regions which are characterized by harsh living conditions and greater probability of inconsistencies between different levels of government, which is caused by peripheral problems. "Northern" specificity is manifested in the well-known problem i.e. in weak and extremely uneven development of information and telecommunication infrastructures.

https://dx.doi.org/10.15405/epsbs.2019.03.16
Corresponding Author: T.P. Skufina
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

The lack of link between the development of the informatization of the economy of the North-Arctic regions (characterized by the informatization of organizations) and the informatization of households is explained by the increased importance of the informatization for population as a consequence of a series of factors (remoteness of these territories, severity of natural and climatic conditions, etc.) and at the same time for the informatization in connection with the factor of high income of the population in these regions. This is what motivates people to engage actively in the processes of the informatization. So, it should be noted that only three North-Arctic regions have informatization ratings for households lower than the national level (table 03, given in parentheses).

Thus, management of the regional development of the North-Arctic regions has two interrelated tasks: 1) to intensify the development of information and telecommunications infrastructures; 2) to intensify the processes of the informatization of organizations located in these regions.

A number of difficulties of these problems solving are associated with modern crisis situation: in a crisis period, regions assign budgetary funds for financing the most important social costs i.e. health care, ensuring the undisturbed operation of heating systems in human settlements, maintaining kindergartens, etc. Terms of crisis limit investments of enterprises in the informatization as well. However, our research shows that regions with similar socio-economic and geographical characteristics often differ from each other according to the informatization level very significantly.

It means that the problem lies in the lack of regional policy. Regional management should explain to business elites that the informatization is not only costs, but also fundamentally new opportunities for filling regional budgets, new opportunities for enterprises to promote their products, diversify their activities, reduce the costs of current economic activity, reduction of transaction costs, etc. We see further development of the research in supplementing the obtained estimates and clarifying the situation based on using surveys of the population, entrepreneurs and representatives of Russia's North-Arctic regions authorities.

Acknowledgments

The research includes the results of the state task assignment of the Federal Research Center Kola Science Center of the Russian Academy of Sciences (KSC RAS) (in terms of raising the problem, substantiating the methodology, research methods, conducting calculations for the informatization of organizations), as well as the research work supported by the grant RFBR and the Government of the Murmansk region No. 17-46-510636 "The differentiation of the socio-economic development of cities and regions of the European North of Russia" (in terms of quantitative assessments of informatization households)..

References

Andrew, R. (2014). *Socio-economic drivers of change in the Arctic*. *AMAP technical report no. 9*. Oslo: Arctic Monitoring and Assessment Program.

Baranov, S., Skufina, T., Samarina, V., & Shatalova, T. (2015). Dynamics of interregional differentiation in Russian regions based on the level of development of information and communication technologies. *Mediterranean Journal of Social Sciences, 6*(6), 384-389. https://dx.doi.org/10.5901/mjss.2015.v6n6s2p384.

Baranov, S.V., & Skufina, T.P. (2015). Comparative dynamics of economic growth and interregional differentiation of the Northern region of Russia. *Voprosy Statistiki, 1,* 69-77. [in Russ.].

Cardona, M., Kretschmer, T., & Strobel, T. (2013). ICT and productivity: conclusions from the empirical literature. *Information Economics and Policy, 25*(3), 109–25.

Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–*2021* (2017). Retrieved from: https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html. Accessed 30/09/2018.

Commander, S., Harrison, R., & Menezes-Filho, N. (2011). ICT and productivity in developing countries: new firm-level evidence from Brazil and India. Review of Economics and Statistics, *93*(2), 528–41.

De Loecker, J., & Goldberg, P.K. (2014). Firm performance in a global market. Annual Review of Economics, 6(1), 201–227.

Demirguc-Kunt, A., Klapper, L., Singer D., & Van Oudheusden, P. (2015). *The global Findex Database 2014: measuring financial inclusion around the world*. Policy Research Working Paper 7255. Washington, DC: World Bank.

Digital Dividends: World Development Report (2016). Washington, DC: World Bank. Retrieved from: http://www.worldbank.org/en/publication/wdr2016. Accessed 30/09/2018.

Dittmar, J.E. (2011). Information technology and economic change: the impact of the printing press. *Quarterly Journal of Economics, 126*(3), 1133–72.

Dobrota, M., Martic, M., Bulajic, M., & Jeremic, V. (2015). Two-phased composite I-distance indicator approach for evaluation of countries' information development. *Telecommunications Policy, 39*(5), 406-420.

European Commission. (2015). *Digital Single Market: Bringing Down Barriers to Unlock Online Opportunities.* Retrieved from: http://ec.europa.eu/priorities/digital-single-market_en. Accessed 29/09/2018.

Hallward-Driemeier, M., & Pritchett, L. (2015). How business is done in the developing world: deals versus rules. *Journal of Economic Perspectives, 29*(3), 121–40.

Healy, A. (2017). Innovation in circumpolar regions: new challenges for smart specialization. *Northern Review, 45*, 11-32.

Lam, P.L., & Shiu, A. (2010). Economic growth, telecommunications development and productivity growth of the telecommunications sector: evidence around the world. *Telecommunications Policy, 34*(4), 185–99.

Lipsey, R.G., Carlaw, K.I., & Bekar, C.T. (2005). *Economic transformations: general purpose technologies and long-term economic growth*. Oxford: Oxford University Press.

Milenkovic, M.J., Brajovic, B., Milenkovic, D., Vukmirovic, D., & Jeremic, V. (2016). Beyond the equal-weight framework of the Networked Readiness Index: a multilevel I-distance methodology. *Information Development, 32*(4), 1120-1136.

Pradhan, R.P., Arvin, M.B., Norman, N.R., & Bele, S.K. (2014). Economic growth and the development of telecommunications infrastructure in the G-20 countries: a panel-VAR approach. *Telecommunications Policy, 38*(7), 634-649.

Skufina, T.P., Baranov, S.V., & Samarina, V.P. (2016). Dependency between economic development of the Russian regions and their level of informatization. *Actual Problems of Economics, 7*(181), p. 485-493.

Skufina, T.P., Samarina, V.P., Krachunov, H., & Savon D.Yu. (2015). Problems of Russia's Arctic development in the context of optimization of the mineral raw materials complex use. *Eurasian Mining, 2*, 18-21, https://dx.doi.org/10.17580/em.2015.02.05.