

The Competitiveness of the Amur Region in the Use of Information and Communication Technologies

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Abstract. Article is devoted to a research of competitiveness of the Amur region in the field of use of information and communication technologies in the organizations. Interregional comparisons of use of ICT in the regions entering the Far Eastern Federal District are presented in article. Comparison of regions on a share of the enterprises using personal computers, servers, local computer networks, wide information networks, the website as products means of promoting is represented. Assessment of competitiveness of the Amur region in the Far Eastern Federal District showed low competitiveness of the region in the field of use of information and communication technologies in the organizations. For improving competitiveness of the region in the field of use of information and communication technologies it is necessary to increase costs of acquisition of ICT.

1. Introduction

The development of information and communication technologies (ICT) has a significant impact on the competitiveness of the region. The rapid development and penetration of ICT in all sectors of the economy makes it possible to consider them as the most important source of quality growth and expansion of the range of goods and services, reduction of labour intensity of production, increase of labor productivity, efficiency of production.

At the state level, great attention is paid to the development of the information technology industry. Adopted in 2017, the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030 is aimed at the intensive use of information and communication technologies in the country, first of all, by the state authorities of the Russian Federation, business and citizens. Wide application of domestic information and communication technologies is aimed at attracting investments in the production of innovative technologies, increasing the competitiveness of the Russian Federation in world markets, ensuring its sustainable and balanced long-term development [1, 2].

Analysis of the literature showed that ICT is considered one of the most important sources of growth of international competitiveness of countries [3]. According to the World Economic Forum, the competitiveness index of the economies of States has a high level of correlation with the development index in the countries of information and communication technologies [1].

Problems and prospects of information technology market development in Russia are considered in works [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]. For example, in the work of Baranov S. V., Skufina T. P., it

is shown that despite the significant growth rate in all positions reflecting the development of ICT, Russia is still lagging behind the developed countries of the world. At the same time, the authors formulate the main reasons for Russia's lag in the field of ICT.

The importance of ICT for building the competitiveness of the region is presented in the works [15, 16, 17, 18, 19, 20]. At the same time, it should be noted that there are no publications related to the analysis of the use of ICT in the Amur region. In this regard, the study of the competitiveness of the Amur region in the use of ICT is important both for the analysis and identification of trends and for the development of a strategy to enhance the competitiveness of the region through ICT.

2. Main part

In terms of the level of use of personal computers in organizations, the Amurskaya region is ranked 8th in the Far East Federal District (FSD), in 2017 the indicator amounted to 91.6% of the total number of surveyed organizations in the region (Table 1).

Table 1. Use of information and communication technologies (personal computers) in organizations (As a percentage of the total number of surveyed organizations of the relevant subject of the Russian Federation) [21].

Region	2005	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	91,1	93,8	94,1	94	94	93,8	92,3	92,4	92,1
Far Eastern Federal District	90,1	92	91,1	92,9	93,3	94,9	93,4	93,6	93,1
Republic of Saha (Yakutia)	90,1	94,7	91,3	92,9	94,5	97,7	98,3	95,1	95,8
Kamchatsky Krai	93,5	96,6	96,3	97,1	98,2	98	99,1	99,4	98,6
Primorsky Krai	84,4	87,5	89,4	90,8	91,1	92,4	85,7	87,4	87,9
Khabarovsk Krai	99,8	99,6	99,5	99,2	98,1	98,7	99,1	98,4	94,9
Amur Region	87,3	84,1	81,1	86	87,2	91	93	95,2	91,6
Magadan Region	97	95,8	93	95,6	96,6	96,4	98,3	96,3	94,3
Sakhalin Oblast	92,2	91,8	92,5	94,5	93,6	93,9	94,4	92,2	95,8
Jewish Autonomous Region	92,7	90,9	90,9	92,4	91,4	91,2	81,4	92,7	91,8
Chukot Autonomous District	100	98,7	99,1	98,2	99,2	98,9	97,9	97,9	94,3

This value is less than the all-Russian level by 0.5 p.p. and less than the Far East level by 1.5 p.p. In FSD the lowest level of use of personal computers in organizations is observed in Primorsky Krai - 87.9% in 2017. The leader in FSD on this indicator is Kamchatsky Krai - 98.6% in 2017.

Considering the position of the Amur region as a whole in the Russian Federation, its situation in the country is not the worst, because according to statistics in some regions of the country the level of use of personal computers in organizations is much lower than the average Russian figure. Thus, in Tomsk region the share of use of personal computers in organizations in 2017 was only 76.6%, in Samara region - 80.9%, in Novosibirsk region - 81.9%, in Volgograd region - 82.9%, in Omsk region - 84.4%. In the Russian Federation only in Moscow and two other regions: in the republics of Crimea and Ingushetia in 2017 there was 100% use of personal computers in all organizations.

According to dynamics of an indicator in the Amur region for the considered period the level of use of personal computers in the organizations increased from 87.3% in 2005 up to 91.6% in 2017 or by 4.3 items. Therefore, it is possible to speak also about improving competitiveness of the region in use of information and communication technologies in the organizations.

The leading role in the organization of computing systems and networks is played by servers which are the powerful computers with big disk memory used for storage of files and programs. Servers are used to accumulation and transfer of public information in computer networks and work usually 24 hours a day.

Since 2014 use of servers sharply increases in the organizations in all regions of the country. In the Amur region use of servers in the organizations grew from 6.6% in 2005 to 44.8% in 2017 or on 38.2 items (by 6.8 times). The average share of the organizations using servers in Russia in 2017 made 50.6%, and in the FEFD – 51.4%. The greatest share of the organizations using servers in work in 2017 was observed in St. Petersburg – 75.0%, in Moscow – 74.8%, on the third place – Khanty-Mansi Autonomous Okrug – 66.6%. Further regions of the FEFD follow, in particular, in Chukotka Autonomous Okrug the value of an indicator was 65.3%, in Kamchatka Krai – 63.7%, in the Sakhalin region – 62.5%. Among regions of the FEFD the Amur region on this indicator also takes the eighth place.

It is known that the necessary condition for effective work of the modern company in which not to do without computers, of modems, servers, routers, switches, operating systems, network protocols and other electronic devices is existence of the local computer network (LCN). However dynamics of use of a LAN by the organizations has multidirectional character. In some regions use of a LAN in the organizations increased, in others was reduced. So, the peak of use of a LAN in the organizations in Russia fell on 2013 – 73.4% of total number of the inspected organizations in the country. Further sharp reduction of use of a LAN in the organizations is observed. In the Russian Federation the share of the organizations using local computer networks was reduced to 61.1% in 2017, in the FEFD – from 71.1% in 2013 up to 61.9% in 2017. In the Amur region in 2017 in comparison with 2013 the specific weight of the organizations using a LAN was reduced slightly – by only 1.2 items, and in comparison with 2005 grew by 24.9 items up to 62.4%. Among regions of the FEFD the Amur region on the level of use of local computer networks in the organizations in 2017 was in the 6th place.

Local area networks are integrated into global information networks, which connect computers that are geographically distant from each other and are a powerful global means of information exchange. Global information networks enhance the use of information and communications technology in organizations.

In the Amur region, the share of organizations using global information networks increased from 41.2% in 2005 to 88.7% in 2017 or by 47.5 p.p. This indicator is high in almost all regions of the Russian Federation and averages 89.7 per cent. In the Far East, the largest share of organizations using global information networks is observed in Kamchatov Krai (96.1% in 2017), Sakhalin Region (94.5%), Khabarovsk Krai (93.6%). The Amurskaya region in this rating occupies the sixth position. It follows that the potential of global information networks in the Amur region has not been fully exploited.

Similarly in the region Internet resources in the organizations are under-exploited. The share of the organizations of the Amur region using the Internet in 2017 made 84.4%, from them the specific weight of the organizations using broadband access is equal to 76.1%.

In the conditions of dynamic development of information society by one of productive means of promoting of products of the organization on the market existence of the website is. Use of the website allows the modern organizations to create image of the company, its recognition, to establish feedback coupling with consumers of the organization, to improve customer service, communications, to cut down expenses on other types of advertizing media, to increase income of the company due to Internet sales, gives unlimited opportunities to demonstration of a product and other competitive advantages. However in Russia the specified instrument of marketing is used not rather widely.

Specific weight of the organizations which had the website in the Russian Federation from 2005 to 2017 grew from 14.8% to 47.4%, i.e. for the studied period growth of a share of such organizations by 32.6 items is observed. In the Amur region the share of the organizations which had the website grew from 9.4% in 2005 to 35.8% in 2017 or on 26.4 items. As well as in general in the country, in the Amur region there was a considerable expansion of use of websites in activity of the modern

organizations. Nevertheless, in the FEFD the Amur region in 2017 was in the last place on the considered indicator. In three regions of the FEFD the share of the organizations which had the website exceeded average value across Russia (47.4%), in particular, in Khabarovsk Krai the indicator was 53.6%, in Kamchatka Krai – 52.9%, in the Sakhalin region – 51.7%.

Leading regions in the country on use of websites by the organizations treat the Republic of Ingushetia – 73.8%, St. Petersburg – 68.4%, Moscow – 66.8%, the Tambov region – 64.9%, the Chuvash Republic – 64.1%.

It should be noted that the Amur region lags behind regions of the FEFD and on number of personal computers on 100 workers. In spite of the fact that for the considered period the number of personal computers on 100 workers in the Amur region grew from 19 pieces in 2005 to 42 pieces in 2017, nevertheless, this indicator less average Russian indicator on 8 pieces and Far East – on 6 pieces. In the FEFD in four regions the specified indicator exceeds the average Russian value, in particular, in the Magadan region – 56 pieces, in Kamchatka Krai – 54 pieces, in the Sakhalin region – 53 pieces, in Khabarovsk Krai – 52 pieces.

Carrying out the analysis of use of information and communication technologies in regions, it is necessary to consider costs of their acquisition. In the Amur region in 2017 in comparison with 2013 the level of costs of ICT decreased by 20% from 4770.9 million rubles in 2005 up to 3830.7 million rubles in 2017. In structure of costs of ICT in the region the largest specific weight is occupied by costs of acquisition of ADP equipment and office equipment (25.85%), costs of acquisition of the software (24.25%), costs of telecommunication fee (17.36%).

In the Amurskaya region, the share of organizations using electronic document circulation is high (68.9% in 2017), which is higher than the average Russian level (66.1%). In addition, the region leads in the FSD in the share of organizations that used electronic data interchange between their and external information systems. In 2017, the value of this indicator amounted to 76.5% of the total number of surveyed organizations in the region, which is higher than the average Russian level by 13.4 p.p.

According to the above-mentioned indicators, the competitiveness of the Amur region in the Far East Federal District in the field of use of information and communication technologies in organizations has been assessed. The evaluation of the competitiveness of the region was based on the following sequence of actions:

- 1) collection, processing and analysis of statistical data on the use of information and communication technologies in organizations of practically all types of economic activities (without small business entities);
- 2) selection of statistical indicators to assess the competitiveness of the region in the use of information and communication technologies;
- 3) calculation of single indicators of competitiveness of each region by means of correlation of the value of the compared indicator with the maximum value of the indicator for all considered regions in the corresponding year;
- 4) calculation of the average competitiveness index of regions;
- 5) rating the competitiveness of regions in the sphere of use of information and communication technologies in organizations;
- 6) formulation of conclusions and development of recommendations to improve competitiveness of the analysed region.

The results of the calculations are shown in Table 2.

In 2010-2016, the leader in the use of information and communication technologies in the organizations was Khabarovsk Krai, but in 2017 the region lost its position to Kamchatov Krai. Until 2017 Kamchatsky Krai for a long period occupied the second place in the rating of competitiveness. The rating of the Amur region in the sphere of use of information and communication technologies in organizations during the period under review increased from the 9th place in 2005 to the 6th place in 2017.

Table 2. Rating of competitiveness of FSD regions in the sphere of use of information and communication technologies in organizations.

Region	2005	2010	2011	2012	2013	2014	2015	2016	2017
Republic of Saha (Yakutia)	7	7	7	7	7	8	8	8	8
Kamchatsky Krai	5	2	5	2	2	2	2	2	1
Primorsky Krai	4	6	6	6	6	6	7	7	7
Khabarovsk Krai	2	1	1	1	1	1	1	1	3
Amur Region	9	9	9	9	8	7	6	6	6
Magadan Region	6	3	2	3	3	4	4	3	4
Sakhalin Oblast	3	4	3	4	4	3	3	4	2
Jewish Autonomous Region	8	8	8	8	9	9	9	9	9
Chukot Autonomous District	1	5	4	5	5	5	5	5	5

The calculation of the correlation coefficient ($r = 0.959$) showed that there was a strong correlation between the Amur region's competitiveness coefficient in the use of information and communication technologies in organizations and the gross regional product (GRP) per capita. The more competitive the region is, the more GRP is produced in the region. The regression equation is $Y = - 510.47 + 10.545 * x$. The regression parameter shows that as the value of the competitiveness coefficient increases by one unit, the gross regional product per capita increases by 10.545 thousand rubles.

3. Conclusion

In the Amur region rather high share of the enterprises using personal computers (91.6%) is observed, however in the Far Eastern Federal District on the specified indicator the area lags behind other regions and takes a penultimate position in rating. For 2005-2017 the level of use of personal computers in the organizations of the Amur region increased by 4.3 items that demonstrates gain of intensity of use of information and communication technologies in the region.

Unlike the previous indicator the share of the organizations using servers in the region rather low also makes only 44.8% in 2017 though for the considered period the value of this indicator grew by 6.8 times.

Irreplaceable thing in work of the enterprise in addition to servers is existence of local computer networks. On a share of the enterprises using a LAN the Amur region in the FEFD is in the sixth place. In too time the value of the specified indicator exceeds average about the country and to the Far East.

Level of use of wide information networks in the Amur region is higher, than local (88.7% in 2017 against 62.4%). In too time potentialities of both global, and local information networks in the region are used not fully.

As in general in the Russian Federation, and in the Amur region use of the website as means of promoting of products remains rather expensive tool. In the Amur region the share of the organizations which had the website in 2017 made only 35.8%

The Amur region lags behind regions of the FEFD and on number of personal computers on 100 workers. If in Kamchatka Krai 54 pieces, then in the Amur region – only 42 pieces are the share of 100 workers.

Nevertheless, not on all indicators the region lags behind in use of ICT. So, in the Amur region the share of the organizations using electronic document management (68.9% in 2017) that above the average Russian level on 2.8 items and also using Electronic Data Interchange between the and external information systems (76.5%) is high.

The evaluation of the competitiveness of the Amur region in the Far East Federal District showed the low competitiveness of the region in the use of information and communication technologies in organizations. At the same time, during the period under review, the rating of the Amurskaya region increased from 9th place in 2005 to 6th place in 2017.

It is clear that in order to enhance the region's competitiveness in the use of information and communications technologies, it is first and foremost necessary to increase the cost of acquiring ICT.

IR-technologies in the modern world have affected all spheres of activity of the organization, their introduction into various industries allows to achieve qualitatively new level of production and provision of services, which affects economic performance of the enterprise. The competitiveness of the region is directly related to the level of development of information and communication technologies, as their use increases the efficiency of business, increases the standard of living of the population, stimulates economic growth in the region.

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