

Consumer's Digital Literacy as a Condition of IT-Services Development in Russia

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Abstract. IT services development requires considering characteristics of the target audience. The main aim of this article is to analyze digital literacy in Russia minding regional peculiarities and the materials of scientific research centers. Nowadays digital literacy is one of the most important skills of both an individual and the society as it directly influences the adaptation to the contemporary digital culture and affects how the society perceives innovations and participates in their creation. There are two main factors that are holding back digital consumption: insufficiency of digital competence and the age factor. According to experts, there are 7 types of cities in Russia, determined by the abundance of local digital services - from total inaccessibility to total sophistication. Thus, digitalization of Russians is uneven - along with rapid development of “smart cities”, the implementation of digital services into smaller cities is difficult and unequal.

1. Introduction

IT services development and distribution mainly depends on the level of social readiness to consume this type of services. This readiness, in its turn, is defined by the level of digital literacy of consumers, which according to UN is “*an ability to safely and properly manage, understand, integrate, interchange, estimate and create information and moreover to gain the access to it with the help of digital devices and network technologies in order to participate in economic and social life*”. [1]. A regional public organization “The Centre of Internet Technologies” also defines this term as “*a set of skills and knowledge that are necessary for a safe and effective usage of digital technologies and internet resources*” [2].

In this particular approach digital literacy includes:

- digital consumption—considered as fluency in digital competencies in different urgent life circumstances.
- digital competencies, meaning the total of knowledge, skills, and behavior patterns that let their holders understand how different informational technologies function and what are the opportunities of their usage.
- digital security—forming personal behavioral model which lets him or her use information and communication technologies without any danger for himself or herself, for the sake of data safety and sometimes even life safety.

So, what does an IT technologies consumer looks like today, what is his literacy level and why is the issue of literacy distribution and its improvement is of such great importance in Russia?

2. The Analysis of the Actual State of Digital Literacy of the Russian Population

2.1. Digital literacy Parameters

An American organization “The partnership for supporting XXI century skills” considers digital literacy as the most important and leading power that should be developed in the country’s population. When investigating the parameters that make up digital literacy, the following aspects are considered (table 1):

—a cognitive aspect that characterizes person’s awareness of the place and the importance of information and its impact on the everyday and professional life, also defining the knowledge of how to apply and use modern information technologies and communication channels

—a methodical aspect, which expresses the skills connected to searching and processing necessary information, materials from Internet sources, also characterizing the skills of using a computer and various digital devices, as well as Internet resources;

—an ethical aspect that defines a person’s behavior as an Internet-network consumer, the transformation of formed business etiquette standards to digital etiquette, mastering and following new principles and rules of communication in digital sphere.

Table 1. The Content and Structure of Knowledge, Skills and Behavior Models That Compile Digital Literacy.

	Knowledge	Skills	Behavior models
Cognitive aspect	The presence of digital competencies in different forms	The skills of working with digital products and electronic sources	Critical assessment of informational messages in the Internet. Receiving and mastering new digital
Methodical aspect	Computer literacy and understanding technical peculiarities of the electronic devices used, regardless of the interface and the purpose	Searching, sorting out and working with information; knowing how to analyze and combine it	Effective implementation of modern means and communication channels (messengers, social networks, etc.) in everyday and professional life
Ethical aspect	Knowing the rules and the standards of digital etiquette	Technological trends	Skillful and adequate use of the rules of business and group correspondence, and those of account management

2.2. Digital Literacy of Russian Population Considering Regional Peculiarities

Since 2015, ROCIT in close cooperation with an investigation group CIRCON have been carrying out annual researches directed at defining the “Index of digital literacy of the Russian population” on the national scale. [2]. In the basis of this parameter lies a 3-stage model that is comprised of approximately 20 key indicators, covering the sub-indices of digital consumption, digital competencies and digital security.

This digital literacy Index gives an opportunity to diagnose the inconsistencies in distribution and implementation of digitalization in Russia.

The dynamics of digital literacy Index and the corresponding sub-indices is presented at the Table 2.

Table 2. The Dynamics of the Index and Sub-indices of Digital Literacy of the Russian Population.

Indicator	Years			
	2018	2017	2016	2015
Digital literacy Index of the Russian population	4,52	5,99	5,42	4,79
Digital competencies sub-index	5.44	6.48	5.27	4.48
Digital consumption sub-index	4.49	5.35	5.49	5.17
Digital security sub-index	3.29	5.43	5.57	4.86

Note: according to ROCIT data (A regional public organization “The Centre of Internet Technologies”, 2018)

Following from table 2, in 2018 there was a decrease in the value of the digital literacy Index by almost 15% below the value of the same indicator of 2017, as well as below the indicators of the previous years.

Such a rapid decline in the average value of the digital literacy Index, as well as in its constituent sub-indices, is primarily connected to the growing disparity between the levels of digital competencies and of other sub-indices. Thus, in 2015 and 2016 the digital competence of citizens was the weakest issue, but in 2017 and 2018 their importance has grown rapidly and took the first place. This caused a sharp decline in the level of digital security of citizens, which led to an increased gap between the values of sub-indices.

Analyzing the condition of the digital literacy Index in general, it can be noted that approximately 45% of the population currently holds it. We will now look at how the knowledge in the digitalization sphere distributed across our country. The indicators of the ranks of digital literacy in the Federal districts of the Russian Federation are presented in Table 3.

Table 3. Distribution of the Digital Literacy Index Across the Federal Districts of the Russian Federation.

Federal district	Years			
	2018	2017	2016	2015
Central federal district	6,70	6,41	6,78	5,83
Northwestern federal district	6,0	5,95	6,39	6,46
Ural federal district	5,08	5,07	5,07	5,02
Siberian federal district	6,01	5,03	3,71	3,97
Volga federal district	4,50	4,42	4,42	3,3
North Caucasian federal district	2,81	4,40	4,47	4,19
Southern federal district	3,31	4,28	3,47	4,72
Far Eastern federal district	5,20	4,17	4,17	5,17

Note: according to ROCIT data (A regional public organization “The Centre of Internet Technologies”, 2018)

As we can see, an undisputed leader in the level of digital literacy development throughout the observation period is the Central federal district, the Northwestern federal district is also among the three leaders, and the Siberian federal district has recently made a significant progress. The indicators in the southern regions of our country are worse—the lowest rate of digital literacy has been detected in the North Caucasus federal district (2.81) and in the Southern federal district (3.31).

The leadership of the Central federal district in digitalization can be explained by the presence of Moscow and Moscow region as a part of the district, which are flagships of modern educational, scientific, technological, business and everyday digitalization [3].

Moreover, the regions with the highest values of the digital literacy Index are characterized by a large population concentration, stable Internet connection, a large number of Wi-Fi zones, and the sufficiency of social digital infrastructure. We present the data of the investigation "Internet development in the regions of Russia» conducted by Yandex for a comparison [4], table 4.

Table 4. Internet Penetration into the Federal Districts.

Federal district	Rate of people going online at least once a month among the population, in %
Moscow	77 %
Central federal district (except for Moscow)	64%
Saint Petersburg	77%
Northwestern federal district (except for Saint Petersburg)	71%
Southern and North Caucasian federal districts	67%
Volga federal district	64%
Ural federal district	66%
Siberian federal district	67%
Far Eastern federal district	63%
Average value in Russia	67%

Note: according to the research "Internet development in the regions of Russia» carried out by Yandex (2018)

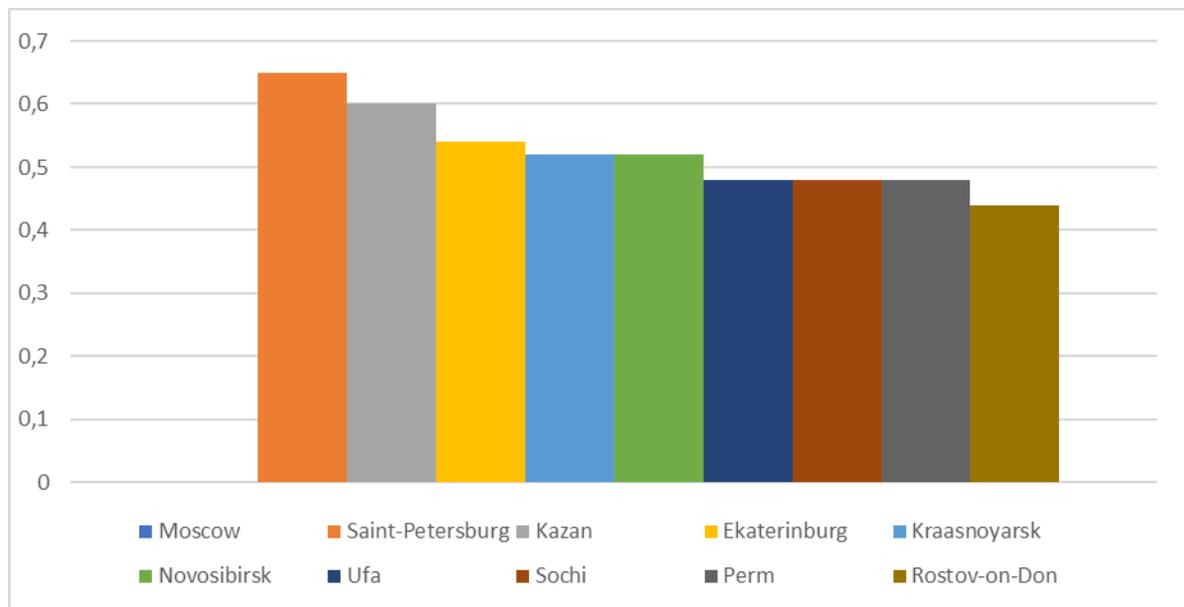
Therefore, the average rate of people going online in Russia is 67% of population. This number is 10% lower than in Moscow and Saint Petersburg. This average directly corresponds to the regional average of digital consumption. Researchers [5] note, that there are some disadvantages in the regions of Russia, which are connected with the implementation of mobile communication that meets modern requirements. Only a third of basic settings that provide cellular communication are equipped in accordance with modern standard of 4G or LTE mobile internet connection.

This situation does not allow regional residents to fully use the opportunities that the state is creating in order to increase the quality of life (in particular, the transfer of various services and social infrastructure to the digital mode by federal and municipal authorities). One of the most famous projects in this area is gosuslugi.ru platform, through which the interaction between the governmental representatives and the population on various issues is carried out, where digitalization and simplification of obtaining a number of national operations and technologies are being implemented.

An effective continuation of this cooperation is the "Smart city" system, which is a complex usage of advanced Internet technologies, a set of today's IT infrastructure opportunities that are accessible in order to create a city with feedback, providing citizens with a wide range of IT solutions for the most important aspects of their life [6].

There are various areas of digitization highlighted in the "Smart city" system, including an opportunity of remote payment for housing and communal services, the development of public access to Wi-Fi, electronic school diary, etc. With an exception of vital processes, some novelties are constantly added to "Smart city" system that make a person's life more comfortable, reducing the time necessary for getting various services [7].

These include various services that can be obtained, formed and paid online: urban transport rent, ranging from scooters to cars in the city car sharing system, online educational programs, electric charging stations, an opportunity to arrange a wide range of documentation, booking tickets and many more. There are some services that are not on the demand in rural areas, such as carsharing and electric charging stations, however for bigger Russian cities most of the services are relevant and needed. Not by chance, population's digitalization, along with the security of citizens, the ecological situation improvement, and many other aspects, was included to the measurement system of the quality of urban environment as one of the 36 indicators, expressed by the quality index of urban environment, which was approved in 2019. Figure 1 shows the rating of the "smartest" cities of the Russian Federation according to the National research Institute of technologies and communications (NIITS), 2018.



Note: according to the data of the National research Institute of technologies and communications (NIITS), 2018

Figure 1. Russian “Smart Cities” TOP-10.

“Smart cities” are the future, but their implementation requires aligning of digital inequality among the population, developing access to broadband and mobile Internet for all the residents of different regions of Russia.

However, there are only a few modern centers that can really be called “smart cities” in Russia. These are cities with population of millions of people, where there is a high population density, where many important life supporting systems and urban governance are concentrated. However, Russia does not only consist of administrative centers of districts and regions. Russia also includes a huge number of small and medium-sized cities and towns, mainly characterized by the lack of local digital services (LCS) supply in terms of digitalization.

A study “Digitalization of small towns in Russia” conducted by The HSE together with “Yandex.Taxi” in 2018 suggests that in almost 800 cities of the Russian Federation, where the population does not exceed 25 thousand people, there is practically no representation of local digital services. Experts concluded that there are 7 types of cities in Russia, determined by the abundance of local digital services—from total inaccessibility to total sophistication.

3. Summary

It is possible to provide some recommendations for the digital literacy development in Russia:

1. Increasing financial support for digitalization processes and technologies, especially on the local level of administration.
2. Ensuring uninterrupted access to the Internet in smaller cities of Russia and in rural areas, as well as providing higher quality of the Internet connection that meets modern standards.
3. Developing and implementing digital literacy subjects into the school curriculum. Organizing career guidance for higher school students by the companies provides digital services.
4. Introducing free professional development programs in terms of digital literacy among Russian population, along with taking measures of educational kind, including implementation of distant programs.
5. Informational centralization for users in the regions. Organizing and conducting regional conferences and meetings for experience exchange between the representatives of different companies,

that implement different projects in the sphere of digitalization on the regional level, providing support in attending exhibitions and conferences of national and world importance.

6. Raising the interest of the employees of different companies and state institutions in perfecting their operations and distributing digital services.

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