

# Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment

Ibragim Agaevich Ramazanov, Seifullakh Agaevich Ramazanov, Svetlana Viktorovna Panasenko, Elena Aleksandrovna Mayorova, Alexander Fedorovich Nikishin

**Abstract:** *The modern trade exists in the context of globalization and the information society establishment. The authors review the development of online trade in the Russian Federation and put the following research questions: how is the information and communication environment established in Russia? is there a link between the economic, information, communication and trade globalization, on the one hand, and the development of digital technologies in the trade sector, on the other hand? what are the prospects for the development of Russian digital trade in the global space? The results have indicated that the use of personal computers, local computing networks, and landline telephone networks in the Russian Federation has reached a level where a further increase in their number is not accompanied by an adequate increase in digital competencies. As a result of the study, the authors have found a relationship between the public activity in online trade and the development of the information society. They have also identified the factors that contribute to positive changes in the structure of Internet use by the population of the Russian Federation to order goods and services; factors hindering the development of online trade; and factors that do not influence the development of online trade. Regardless of the weak and deteriorating legal environment and the low efficiency of investment in innovation, the information society establishment and the development of online trade and the digital economy in the Russian Federation have positive dynamics supported by the activity of global players in the online space.*

**Index Terms:** *digital economy, globalization, information society, online trade.*

## I. INTRODUCTION

The urgency of studying the problems related to the trade development in the context of the information society establishment and the globalization of the world economy is determined by the importance of this industry for the country's economy in the digital economy.

The trade sector has a positive effect on the socioeconomic development of the state and the region, as well as on the well-being of its population [1]. The modern trade exists in the context of globalization, which is an inevitable

**Revised Manuscript Received on July 20, 2019.**

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phenomenon that occurs through the exchange of goods, information, science, culture, etc., according to the UN Millennium Declaration. The development of globalization leads to the expansion of economic, political, social, cultural, and other relations among countries, the development of international trade and financial markets, and the acceleration of integration processes [2]. The involvement of individual countries in the global economy contributes to the inflow of investments, technology, science-intensive production, etc. [3]. Globalization is accompanied by a reduction in poverty in poor countries [4], expands and improves the quality of financial institutions, increases capital inflows [5], creates prerequisites for the development of innovations [6], and removes entry barriers for new entrepreneurs [7].

The current stage of globalization is described by the development of the digital economy. Digital economy is a complicated dynamically changing global phenomenon, which does not have any unambiguous understanding of definition and boundaries. Following an analysis of approaches to the concept of "digital economy", the researchers of the Global Development Institute [8] consider it as part of an economic activity that relies entirely or mainly on digital technologies and business model of digital products and services.

## II. LITERATURE REVIEW

However, most researchers note the dual nature of globalization and emphasize not only positive but also negative sides of this phenomenon [9]. In particular, they argue that the apocalypse cannot be ruled out, if globalization continues for a long time, and the way out is to abandon violent (subjective) globalization [10]. The globalization creates prerequisites for new threats to the development of humans, society, and the state [11]. Inflow of capital can lead to one-sided development of productive forces, irrational use of national resources, non-equivalent exchange, and loss of control over certain enterprises or industries, undermine the activities of local producers, etc. in some situations [12]. The dual nature of globalization is manifested in the intensification of regional development, on the one hand, and leads to increased interregional differentiation, on the other hand [13]. The study of the globalization consequences is also of a particular interest, because it is accompanied by significant changes in the consumption traditions and structure [14].

## Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment

The authors of the article agree with the opinion of researchers who consider globalization as an objective process with the corresponding positive and negative consequences. Besides, they believe that attempts to accelerate or slow down this process may be temporary, followed by the rapid pace of restoring the globalization process dynamics. For an individual company, it is important to be able to operate in a global environment, which develops under the influence of many factors, rather than to manage this process. Such factors as the society informatization, development of the digital economy, and the country's involvement in the information, communication and trade globalization are of particular importance.

Many researchers consider innovations, information technologies and the society informatization as key factors of globalization [15], [16]. E-commerce is considered an important tool for managing crisis amid globalization [17].

Information technologies and informatization of society are considered as key factors in the establishment of the global information and communication environment [18], e-commerce, and the digital economy, as well as accelerating the globalization [15], [19], [20]. It is suggested that the establishment of the information society allows to raise the status and competitiveness of the country [21]-[23] and has a positive effect on the socioeconomic situation of its population amid globalization [24]-[26].

The new information and communication environment creates conditions for the development of the digital economy, where trade holds the leading position. In particular, it is noted that the rapid pace of the digital economy globalization is observed in the retail sector [27]. The retail sector development amid globalization is accompanied by the development of innovations [28], the interaction between trade and e-sports [29], the development of mobile technologies, the emergence of new business models, and growth in the consumer demand for convenience and the purchase price [30]. It is accompanied not only by the establishment of the basis for merging offline and online trade, personalization of trade offers and communications, but also by increasing the requirements for the compactness of the trade companies in innovations based on information technology of the digital economy development [31]. At the same time, not only B2C markets but also C2C digital trading markets are developing. According to Data Insight (Russia's first research agency specializing in the e-commerce market), more than eight million sellers and about ten million buyers were involved in the Russian C2C digital trading market in 2017; the capacity of this market reached 300 bln rubles [32].

The digital model will improve the competitiveness of retailers in the world markets through the development of omnichannel strategies, automating business processes and increasing productivity, using digital technologies to penetrate new segments, improving the return on assets and logistics solutions based on the advanced technologies, etc. [33], [34]. Digital technologies are being actively implemented by global retail chains, but changes in Russian trade occur slower than in the world practice. At the same time, transformations in the retail trade based on digital technologies are irreversible, while the prospects for the development of digital technologies depend on the state of the information and communication infrastructure, security

of cyberspace from crime, etc. [35], as well as on the ability of the Russian digital industry to overcome barriers to the transition to the information society [36]. Besides, large-scale and high-quality transformations are observed in the retail sector under the influence of globalization and the advances of the digital economy [37].

The digital economy is under focus of not only researchers but also the state. The governments of many countries, including Russia, recognize its importance. In particular, the "Strategy for the development of the information society in the Russian Federation for 2017 – 2030" is implemented in the Russian Federation, aimed at establishing new markets based on the information and communication technologies, developing the digital economy, and strengthening the economy in general.

The following conclusion can be made from the review: the countries that ensure favorable conditions for the development of the digital economy-focused trade become more competitive in the global space. The advances in digital technologies and their speed in the introduction, combined with the rapid pace of consumer and customer involvement in this process, have given rise to new problems associated with the need to understand the implications and factors determining their development trends in the digital economy. The market globalization, which (inter alia) is supported by the formation of the information society, the development of information and communication technologies, and the development of the digital economy is a characteristic feature of the modern world and national economy development. Besides, the content analysis suggests that the prospects for the trade development should be considered taking into account the development of digital technologies and the formation of the information and communication environment, as well as the economic, informational and trade globalization.

Following the above, the authors consider it necessary to understand the following:

- how the information and communication environment in Russia is formed;
- whether there is a connection between the economic, information, communication and trade globalization, on the one hand, and the development of digital technologies in trade, on the other hand; and
- what are the prospects for the development of Russian digital trade in the global space.

### III. PROPOSED METHODOLOGY

#### A. Algorithm

The reliability of the results is secured by the compliance with the methodological requirements from the "Provisions on the organization and conduct of selective observation by Rosstat on the use of information technologies and information telecommunication networks by the population in 2018"; "Methods for calculating the indicator "Share of citizens using the mechanism for obtaining state and municipal electronic services"; "Methodological provisions on calculating the index of physical volume of services in telecommunications"; and recommendations of the

"Guidelines of the International Telecommunication Union on measuring access to and use of the ICT in households and by individuals".

The representativeness of the sample is secured by obtaining representative survey results for entire Russia and its regions, as well as a large sample size: the monthly sample size for the ICT survey is about 77 thous. people aged 15 and older (30 thous. households, 0.06 % of the population of this age), which is formed in accordance with the requirements of

the "Basic methodological and organizational provisions for conducting a sample survey of the labor force."

The method of correlation analysis was used to identify the relationships among quantitative and qualitative variables in the information telecommunications environment, the digital economy, trade, and globalization processes.

**B. Flow Chart**

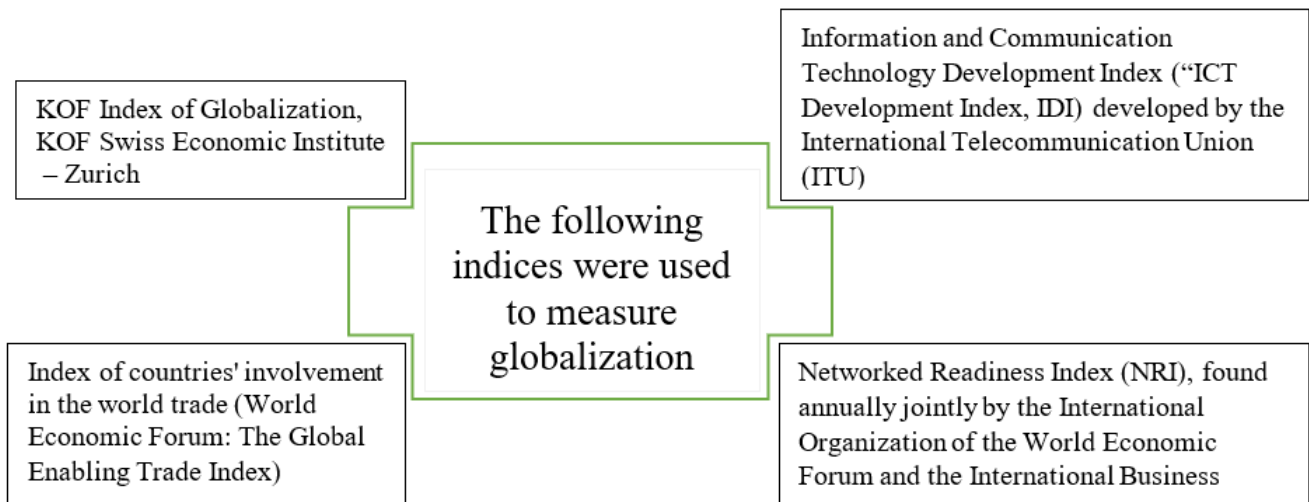


Fig. 1. Indices measuring the process of globalization

**IV. RESULT ANALYSIS**

The establishment of the information society in Russia is accompanied by significant qualitative and quantitative

changes in the use of information and communication technologies by organizations operating in various sectors (Table I).

Table I. State and forecast of the use of information and communication technologies in organizations, %

	Average in Russia			Average in trade organizations		
	2010	2017	2025f	2010	2017	2025f
PC	93.8	92.1	91.2	93.1	94.3	97.2
Servers	18.2	50.6	70.1	22.4	64.3	78.8
Local area networks	68.4	61.1	49.9	72.6	72.1	66.7
Global information networks	83.4	89.7	92.8	88.1	93.5	97.4
Internet	82.4	88.9	91.9	87.5	92.6	95.9
Websites	28.5	47.4	55.1	35.7	52.9	67.3

Sources: Rosstat (2019); Ministry of Digital Development, Communications and Mass Communications of the Russian Federation (2019); calculations of the authors.

The obtained results (Table I) indicate the oncoming significant, multidirectional changes in the use of information and communication technologies by organizations in Russia. In particular, a reduction in the use

of personal computers and local area networks and, conversely, a significant increase in the use of servers, global information networks, Internet, and websites are expected (Fig. 1).

**Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment**

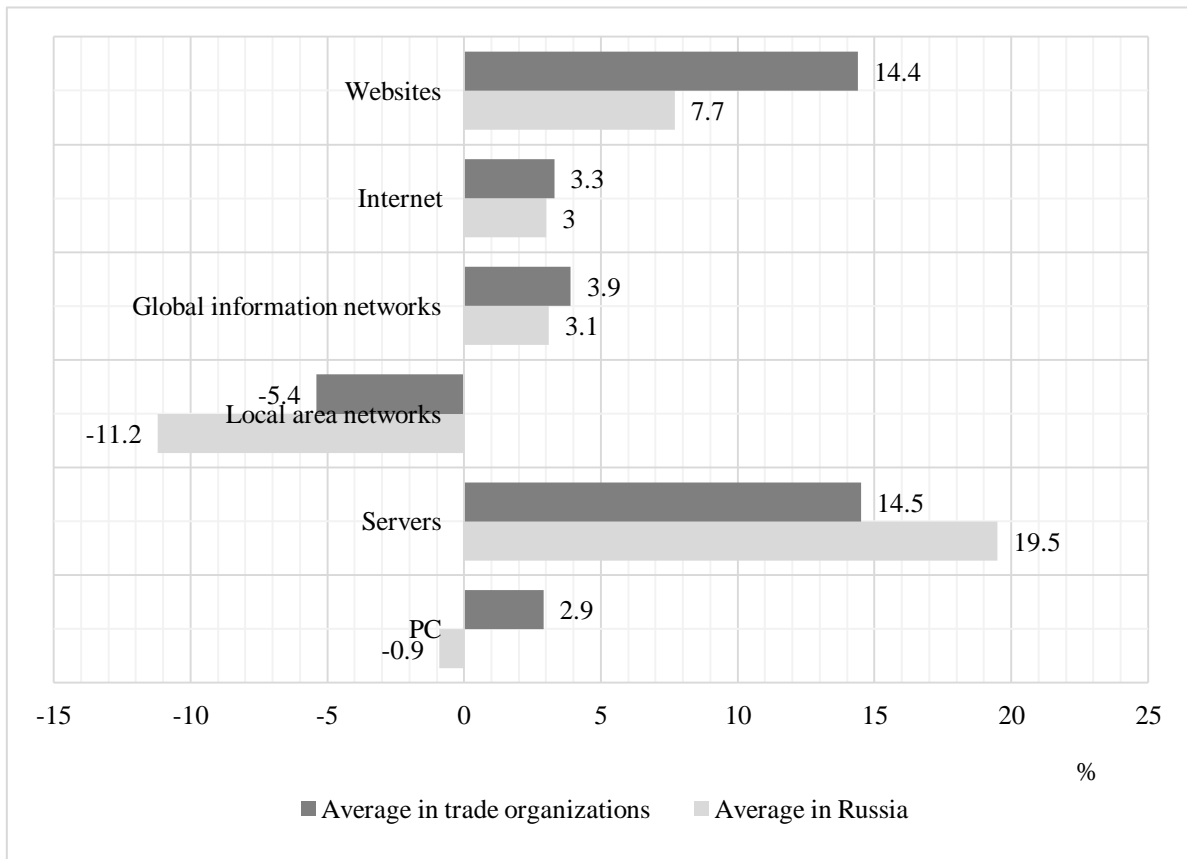


Fig. 1. Projected deviation of the share of organizations using information and communication technologies by 2025 relative to 2018, %

It can be seen from the obtained data (Figure 1) that the positive dynamics are typical for such fields of using information and communication technologies as the development of websites, servers, global information networks, and the use of the Internet. At the same time, a significant reduction in the use of local area networks and personal computers is expected.

Analysis of changes in the use of the landline telephone and mobile networks in the Russian Federation indicates a significant change in favor of mobile telephony: the number of landline telephone subscribers is expected to decrease by

33.4 % by 2025 compared to 2018 (from 32.3 mln in 2018 to 21.5 mln by 2025) and, conversely, an increase in mobile telephone subscribers by 8.6 % is expected (from 300.2 mln in 2018 up to 325.9 mln by 2025, i.e., cellular penetration is 211 units per 100 people).

The information society development in Russia is accompanied by penetration through the mobile and landline broadband Internet access (Figure 2).

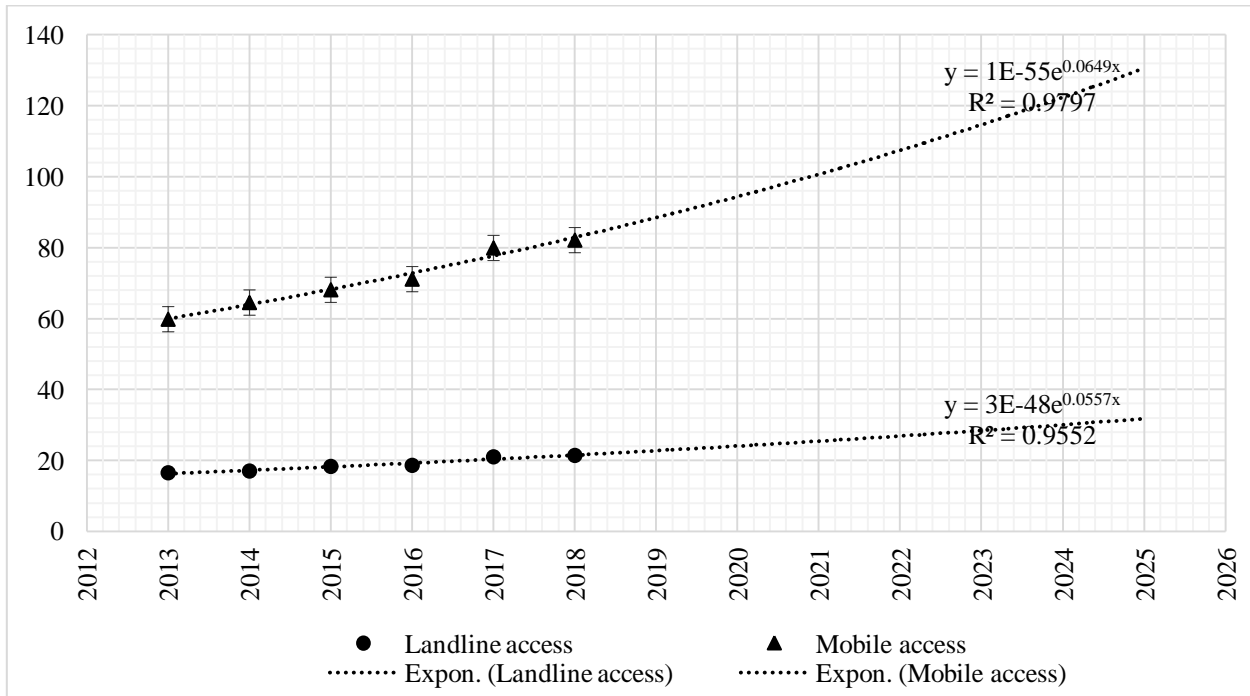


Fig. 2. Projected change in the number of landline and mobile broadband Internet access subscribers per 100 people in the Russian Federation

The penetration of the population into the broadband Internet through the landline and mobile communications has positive trends. However, mobile broadband Internet access is developing at a faster pace than landline broadband Internet access (Fig. 2): the number of subscribers using mobile broadband Internet access can exceed 130 subscribers per 100 people by 2025, while the number of subscribers

using landline broadband internet access can reach 32 subscribers per 100 people in the Russian Federation.

The study of the penetration of information and telecommunication technologies in Russia in the context of global trends indicates a lag compared with countries with developed economies (Fig. 3).

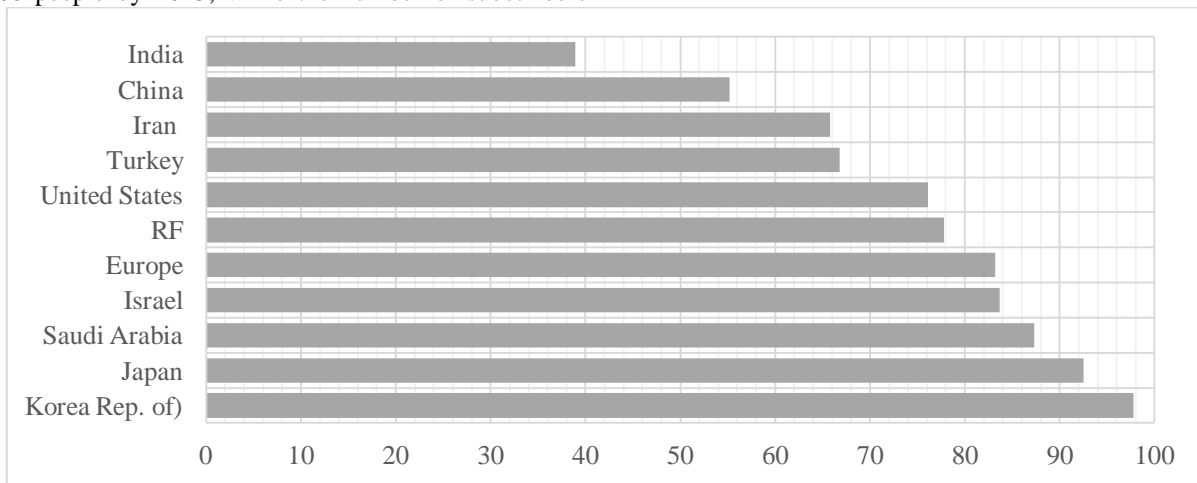


Fig. 3. Share of population using the Internet, 2018, % of the total population

Sources: International Telecommunication Union – ITU, (2018); Rosstat, (2019); Ministry of Communications of the Russian Federation, (2019); and authors' calculations

Comparative analysis (Fig. 4) reveals some lag of the Russian Federation by the share of the population using the Internet compared with Europe and other countries with developed economies and a high technical level of

development (Israel, Saudi Arabia, Japan, and Republic of Korea).

At the same time, there is a fairly high rate of the Internet access penetration in the Russian Federation (Fig. 4).

**Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment**

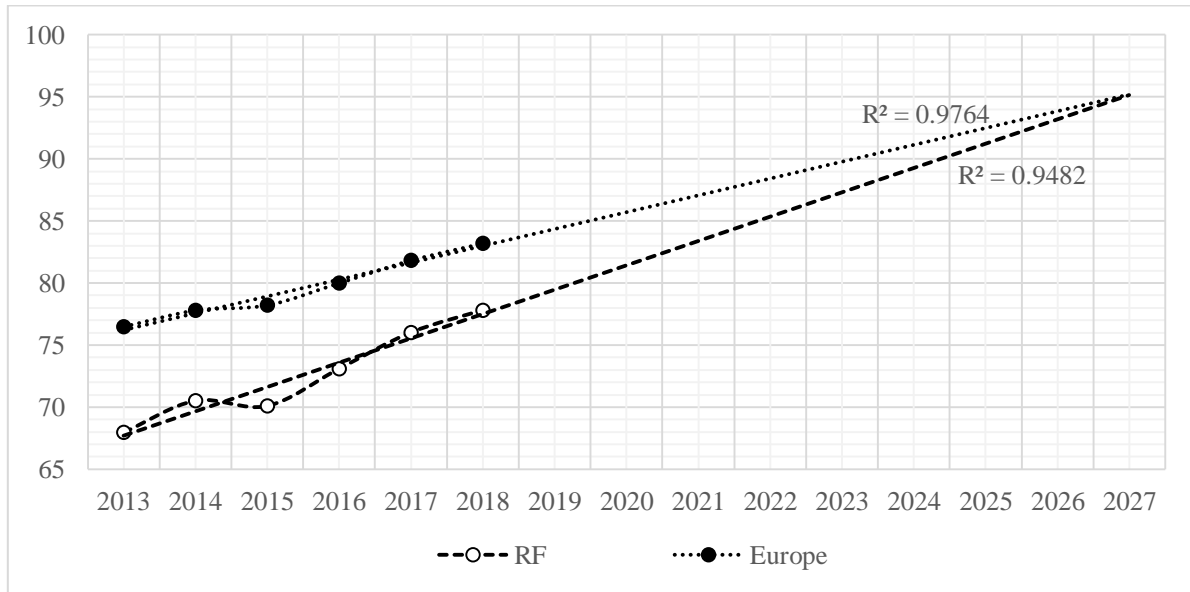


Fig. 4. Projected Internet access penetration in the Russian Federation and Europe

Sources: International Telecommunication Union – ITU (<http://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx>), (2018) Rosstat, (2018), Ministry of Communications of the Russian Federation, (2018); and authors' calculations.

If the prevailing trends of Internet access penetration in Russia continue, the lag from Europe can be narrowed by 2027.

The change in the structure of the population that used the Internet to shop for goods and services by types in the Russian Federation was studied (Fig. 5).

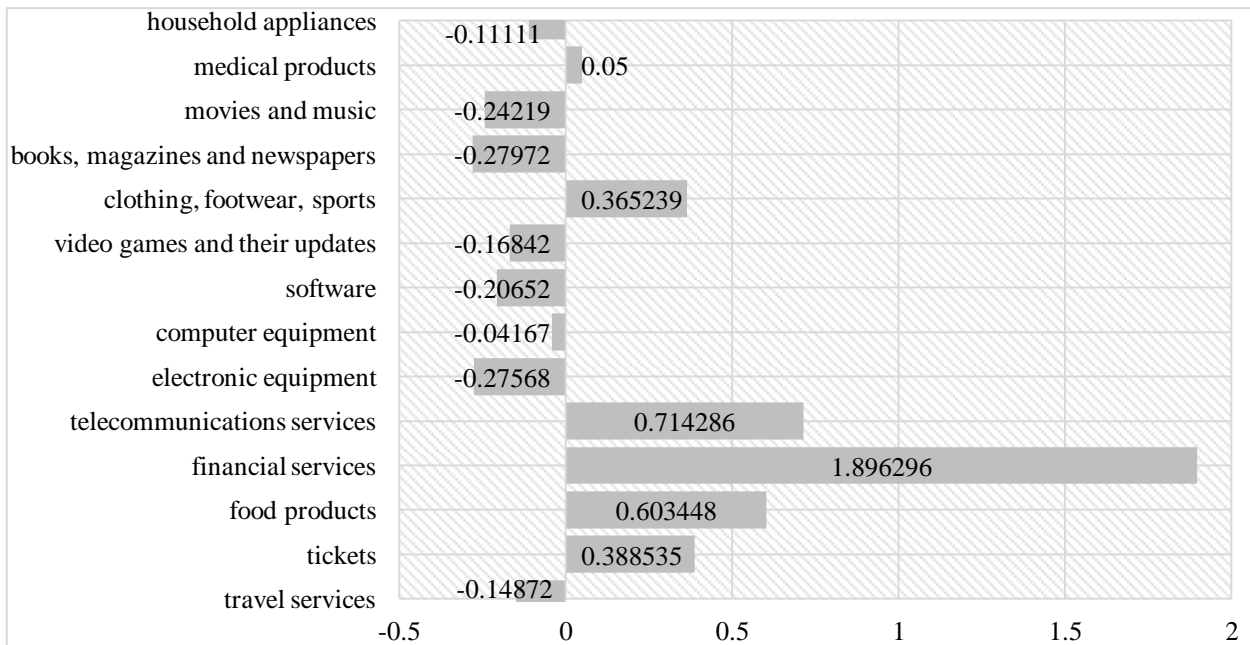


Fig. 5. Changes in the structure of the Internet use by the population of Russia to shop for goods and services by types from 2013 to 2018

The results indicate significant changes in the structure of the Internet use by the Russian population to shop for goods and services by types (Fig. 5): the popularity of shopping for household appliances, movies and music, books, magazines and newspapers, video games and their updates, software, computer equipment, electronic equipment, and travel services is falling and, conversely, the popularity of shopping for medical products, clothing and footwear, telecommunications services, financial services, food products, tickets, etc. is growing. At the same time, the

attitude of the population in obtaining financial services is changing especially fast: the share of the population that received financial services online has almost doubled over the past five years.

The indication of a connection between individual factors of the information society development in the Russian Federation and indicators of the activity of the Russian population in the online trade reveals multidirectionality of



relations between them (Table 2).

Table II. Correlation between the indicators of the online trade and the information society development in the Russian Federation (study period 2010 – 2018)

Indicators of the information society development in the Russian Federation	R – Share of online retail trade turnover (B2C), %	R – Share of population that used the Internet to shop for goods and services, %	R – Share of population that are active Internet users, %	R – Share of population engaged in the sale of goods and services on the Internet (C2C), %
Number of personal computers per 100 people	0.68	0.62	0.19	0.21
Share of organizations that have servers, %	0.90	0.89	0.90	0.85
Share of organizations using local area networks, %	-0.40	-0.45	-0.93	-0.92
Share of organizations using global information networks, %	0.87	0.84	0.61	0.61
Share of organizations using the Internet, %	0.90	0.87	0.71	0.73
Share of organizations using websites, %	0.92	0.91	0.88	0.83
Number of landline broadband Internet subscribers per 100 people	0.98	0.97	0.96	0.96
Number of mobile broadband Internet subscribers per 100 people	0.95	0.94	0.98	0.98
Share of organizations using the Internet, %	0.88	0.85	0.73	0.81
Share of organizations using broadband Internet access, %	0.88	0.85	0.79	0.86
Share of organizations that had a website in the total number of surveyed organizations, %	0.96	0.95	0.94	0.93
Share of organizations that placed orders for goods online, %	0.55	0.51	-0.85	-0.84
Share of households with a telephone, %	0.94	0.93	0.91	0.86
Share of households with a landline telephone only, %	-0.94	-0.92	-0.93	-0.89
Share of households with a mobile telephone only, %	0.99	0.99	0.99	0.99
Share of households with both landline and mobile telephones, %	-0.79	-0.78	-0.62	-0.54
Share of households with broadband Internet access, %	0.89	0.87	0.98	0.97
Share of population that placed orders for goods and services online, %	0.99	-	0.97	0.98
Share of population that are active Internet users, %	0.99	0.97	-	0.99

The results of the analysis indicate a close direct correlation dependence of the population activity in online trade on such indicators of the information society establishment in the Russian Federation as "Number of landline broadband Internet subscribers per 100 people" (R ranges from 0.96 to 0.98), "Number of mobile broadband Internet subscribers per 100 people" (R ranges from 0.94 to 0.98), "Share of organizations that had a website in the total number of surveyed organizations" (R ranges from 0.93 to 0.96), "Share of households with a mobile telephone only" (R ranges from 0.99), "Share of population that placed orders for goods and services online" (R ranges from 0.97 to 0.99), and "Share of population that are active Internet users" (R ranges from 0.97 to 0.99). No correlation or weak correlation describe such indicators as "Availability of a personal computer" (R ranges from -0.40 to -0.93), "Global information networks" (R ranges from -0.40 to -0.93), "Internet access" (R ranges from -0.40 to -0.93), and "Share of organizations using the Internet" (R ranges from -0.40 to

-0.93). At the same time, "Local computer networks" (R ranges from -0.40 to -0.93), "Share of households with a landline telephone only" (R ranges from -0.89 to -0.94), and "Share of households with both landline and mobile telephones" (R ranges from -0.54 to 0.79) all have a restraining effect.

A study of the network readiness of the Russian Federation can ensure greater justification in determining the prospects for the online trade development. According to the World Economic Forum, the Networked Readiness Index (NRI) of Russia is 4.54 (out of 7), which is comparatively higher than the world average (NRI = 4.15). At the same time, it lags far behind the economically developed regions and countries – in particular, Europe (average NRI = 5.22; NRI ranges among countries from 3.99 in Serbia to 5.9 in Finland), the USA (NRI = 5.82), Israel (NRI = 5.44), Korea (NRI = 5.57), Japan (NRI = 5.65), and others.



## Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment

Table III. Comparative characteristics of the NRI subindices (1 – 7 (best)) of Russia and the leading world economies

	Europe (average)	China	Japan	RF	USA
Effectiveness of law-making bodies (1 – 7)	4.45	4.19	5.44	3.58	4.04
Laws relating to ICTs (1 – 7)	4.85	4.24	4.84	3.81	5.27
Judicial independence (1 – 7)	5.23	3.89	6.19	2.90	5.15
Efficiency of legal system in settling disputes (1 – 7)	4.42	3.98	5.39	3.19	4.87
Efficiency of legal system in challenging regs (1 – 7)	4.40	3.49	4.58	2.92	4.79
Intellectual property protection, (1 – 7)	5.19	3.97	6.07	3.02	5.77
Software piracy rate, % software installed	35.30	74.00	19.00	62.00	18.00
Int'l Internet bandwidth, kb/s per user	496.72	5.00	48.64	29.86	70.97
Prepaid mobile cellular tariffs, PPP \$/min.	0.28	0.06	0.37	0.03	0.27
Fixed broadband Internet tariffs, PPP \$/month	29.24	33.99	20.72	15.73	16.32
Individuals using Internet, %	82.59	49.30	90.58	70.52	87.36
Fixed broadband Internet subs/100 pop.	31.92	14.38	29.31	17.51	31.06
Use of virtual social networks (1 – 7)	6.07	4.72	5.88	5.63	6.57
Capacity for innovation (1 – 7)	4.84	4.20	5.27	3.77	5.94
ICT use for business-to-business transactions (1 – 7)	5.49	4.88	6.06	4.82	5.71
Business-to-consumer Internet use (1 – 7)	5.40	5.28	5.95	5.13	6.32
Gov't success in ICT promotion (1 – 7)	4.43	4.52	4.71	4.19	4.78
Impact of ICTs on business models (1 – 7)	5.22	4.72	5.31	4.02	5.52
Impact of ICTs on new organizational models (1 – 7)	4.96	4.74	4.72	4.02	5.77
Impact of ICTs on access to basic services (1 – 7)	5.35	4.64	5.39	3.90	5.73
Networked Readiness Index (1 – 7)	5.22	4.24	5.65	4.54	5.82

According to the World Economic Forum report, the following key factors hinder the increase in the network readiness of the Russian Federation: weak and deteriorating regulatory environment and a high proportion of pirated software (NRI subindices of legal support for network readiness is around three points out of seven possible); cheap plans for mobile and landline Internet (Prepaid mobile cellular plans, PPP \$0.03/min.), which are accompanied by a rapid increase in the number of individual users and lead to a

drop in Internet bandwidth per user (Int'l Internet bandwidth, 29.86 kb/s per user).

At the same time, the NRI subindex "Business-to-consumer Internet use" approaches the values of economically and technologically developed countries (NRI = 5.3).

The authors carried out an analysis of the dynamics of subscription fees, bandwidth, and Internet investments in the Russian Federation for greater justification of individual conclusions (Table IV).

Table IV. Dynamics of subscription fees, bandwidth, and Internet investments in the Russian Federation

	Unit of measurement	2013	2014	2015	2016	2017	2018
subscription fee	rub.	538.67	565.44	571.11	559.44	571.48	581.7
	% to the previous period	100.3	105.0	101.0	98.0	102.2	1.02
	% to 2013		105.0	106.0	103.9	106.1	108.0
Internet bandwidth	kb/s per user	31.71	32.84	41.25	29.86	35.3	36.2
	% to the previous period		1.03564	1.25609	0.72388	1.18218	1.03
	% to 2013		103.6	130.1	0.94	111.3	114.2
telecommunications activities	bln rub.	339.5	348.0	352.4	389.0	369.2	393.7
	% to the previous period		102.5	101.3	110.4	94.9	114.1
	% to 2013		102.5	103.8	114.6	108.7	160.0
information technology activities	bln rub.	12.3	13.0	13.3	14.5	25.5	26.1
	% to the previous period		105.7	102.3	109.0	175.9	119.2
	% to 2013		105.7	108.1	117.9	207.3	212.2
investments in software and databases	bln rub.	36.3	57.3	94.4	157.5	253.9	414.5
	% to the previous period		1.59	1.65	1.67	1.61	1.63
	% to 2013		157.9	260.0	433.9	699.4	1141.9

The results (Table 4) mainly confirm the conclusions of the World Economic Forum. In particular, the Internet bandwidth has increased by only 3 %, and the monthly fee increased by 2 % over the past five years (from 2013 to 2018). At the same time, a direct correlation dependence was found between the dynamics of the Internet bandwidth indices and the subscription fee for services ( $R = 0.72$ ). There

has been a sharp increase in investment in areas related to the information telecommunication technologies development in recent years. For example, investments have increased more than 1.6 times in telecommunications, more than 2.1 times in the field of information technology, and 11.4 times in



software and databases over the past five years.

The dependence of the country's network readiness, the prospects for the online trade and the digital economy development on the innovative activity of organizations necessitates a research into the innovative activity in the Russian Federation. The authors project a significant drop in the innovative activity of organizations in Russia. In particular, the share of innovation-active organizations in the Russian Federation has decreased by 2 % over the past five years (from 2013 to 2018): from 10.1 % in 2013 to 8.1 % by

2018. The authors project a further drop in the innovation activity of organizations: by 2025, the share of innovation-active organizations may decline by almost 3 % (from 8.5 % in 2018 to 5.1 % by 2025). At the same time, a significant drop in innovation activity is projected, including in the areas of activity directly associated with the establishment and development of the information society, the network readiness of the country, online trade and the digital in the Russian Federation economy in general (Fig. 6).

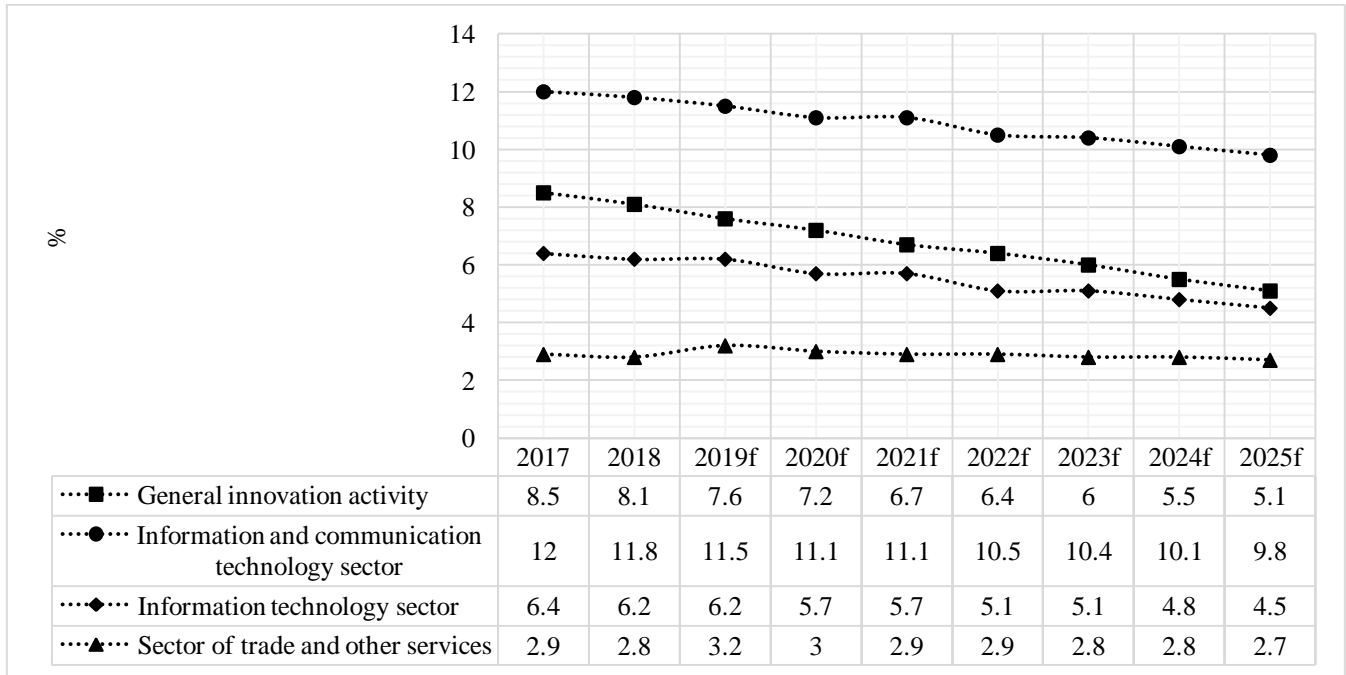


Fig. 6. Projected innovative activity of organizations in certain activity fields in the Russian Federation (Rosstat (2018), Ministry of Communications and Mass Communications (2018), and authors' calculations)

The results reveal (Fig. 6) a decline not only in the total share of innovation-active organizations, but also in the telecommunications sector (decline by 2 % compared to 2018) and information technologies (1.7 %), while the sector of trade and other services is expected to stagnate as before or decline as well (0.1 %).

However, the establishment and rapid development of B2C and C2C Internet market for goods and services is observed against unsatisfactory NRI subindices, low efficiency of investments in the development of the information society, and declining innovative activity of

organizations in areas related to the information and communication technology development. In particular, it was revealed that the share of the population that used the Internet to sell or buy goods had increased 1.7 times over five years and could reach 32.5 % in 2025.

The results necessitate finding out how the development of online trade in the Russian Federation is compensated for under the opposite trends in the development. The authors examined the relationship between the indicators of the online trade development and the globalization of the world economy to answer this question (Table V).

Table V. Correlation between digital trade and globalization indicators

	KOFGI <sub>World</sub>	KOFGI <sub>Europe</sub>	KOFGI <sub>RF</sub>
C2C market of goods and services, %	0.98	0.97	0.84
Using the Internet to shop for goods and services, %	0.97	0.95	0.84
Online retail share in retail turnover, %	0.96	0.94	0.88

The results indicate a fairly close correlation between the indicators of the online trade development and the globalization dynamics. A closer direct correlation has been found between the indicators of the online trade development and the globalization dynamics as a whole (KOFGI<sub>World</sub>; R ranges from 0.96 to 98) and the globalization in Europe (KOFGI<sub>Europe</sub>; R ranges from 0.91 to 92) than between the indicators of the online trade development and the

globalization dynamics in the Russian Federation (KOFGI<sub>KOF-RF</sub>; R is 0.84 – 88).

## V. DISCUSSION

The government of the Russian Federation emphasizes the need for population to acquire digital competencies. At the same time, the main reasons for lagging behind economically and technologically developed countries, including Europe, include the insufficient use of personal computers and the Internet information telecommunications network (Program "Digital economy of the Russian Federation", approved by the order of the Government of the Russian Federation No. 1632-r dated July 28, 2017). However, the results obtained by the authors indicate that the availability of personal computers, Internet access, telephone communications, etc., are no longer the main factors limiting digital competence, the establishment of the digital society, and the development of the digital economy. The study resulted in the following findings. According to the authors, the reduction in the use of PCs, local area networks (Fig. 1), and landline telephone networks is due to their declining relevance: these ICT areas have reached their limits of efficient and effective application in Russia, like in many countries with developed information and telecommunications infrastructure. Besides, their reduction is associated with the development of new information and communication technologies, the market of information and communication services, the need to expand the interaction between economic agents in the global external environment, the expediency of using flexible and more efficient mobile information and communication means, etc. Lagging behind countries with developed economies in the penetration of information and telecommunication technologies significantly influences the development of the digital economy, including the online trade in the Russian Federation. Changes in the structure of the Internet use by the population of the Russian Federation for ordering goods and services (Fig. 5) are determined by many reasons, including the following factors increasing the attractiveness of online trade: increasing technical capabilities and accessibility of the Internet, simplified procedures and reduced time of receiving goods and services via the Internet, attractiveness of the online merchants' pricing, etc. The factors contributing to the narrowing of shopping for goods and services online include changes in consumer behavior, narrowing capacity of the markets for certain goods and services, marketing efforts made by traditional sales channels for goods and services, etc [38]. Analysis of correlation between the indicators of population activity in online trade and the information society development in the Russian Federation (Table 2) leads to the following conclusions: 1) the development of online trade and, therefore, the digital economy as a whole, largely depends on the degree of information society development, which is an important factor in the economy development in the era of the fourth industrial revolution; 2) certain components that make up the information society of the Russian Federation have multidirectional impact on the development of online trade, depending on their degree of development, accessibility and relevance in the era of digital economy; 3) an increase in the number of landline broadband and mobile Internet access subscribers, the activity of organizations in the online space (an increase in the share of organizations that have a website), and an increase in the

share of the population and households with mobile communications and the Internet access, the activity and confidence of the population when using the Internet to order goods and services all have positive impact on the development of online commerce; 4) factors that do not influence the development of online trade include the number of personal computers in the population or organizations, since the balance of online activity shifts in the direction of portable devices; low activity of the population and organizations when ordering goods and services in the global information environment; the use of nonbroadband Internet access by the population and organizations also limits their activity in online trade; 5) a restriction of the organizations' activities in local computer networks, restriction of the population and organizations imposed by landline telephony, and the presence of both landline and mobile cellular networks without Internet access all have a significant restraining effect on the online trade development. Analysis of the dynamics of subscription fees, bandwidth and investment in areas related to the information and telecommunication technologies development (Table 4) suggests that subscription fees and Internet bandwidth are interrelated: low subscription fee is one of the significant factors constraining the Internet bandwidth in the Russian Federation; increased investment in areas related to the information and telecommunication technologies development is not accompanied by an adequate increase in Internet bandwidth; and the low efficiency of investments in areas related to the information and telecommunication technologies development can be explained by a weak and deteriorating legal environment for the protection of intellectual property, a high proportion of pirated software, etc. The analysis suggests that the innovative activity of organizations will fall, regardless of a 2–3-fold increase in investment in this industry, if the situation prevailing in the development of the information society in the Russian Federation persists (Fig. 6). The reasons include a deteriorating legal environment for the protection of intellectual property, a high proportion of pirated software, etc., as well as an increased competition in the global space.

The studies reveal (Table V) that, regardless of the low efficiency of investments in innovative activities of organizations, the establishment of the information society, and the development of online trade and the digital economy in the Russian Federation show a positive trend. As can be seen from the results, a considerable degree of involvement of the Russian Federation in the process of globalization might have a significant positive effect on these processes.

## VI. CONCLUSION

The study has resulted in the following conclusions:

1. The use of personal computers, local area networks, and landline telephone networks in the Russian Federation has reached a level where a further increase in their number is not accompanied by an adequate increase in digital competencies.

The decline in their efficiency is also associated with the development of new information and communication technologies, the market for information communication services, the need to expand the interaction between economic agents in the global external environment, the feasibility of using flexible and more efficient mobile information and communication means, etc. Lagging behind countries with developed economies in the penetration of information and telecommunication technologies has significant impact on the development of the digital economy, including online trade in the Russian Federation.

2. The factors contributing to the positive changes in the structure of the Internet use by the population of the Russian Federation for ordering goods and services and development of the digital economy as a whole include expanding the technical capabilities and accessibility of the Internet, simplifying procedures and reducing the time to acquire goods and services online, the attractiveness of online merchants' pricing, etc. The factors hindering the activity of the population when ordering goods and services online include changes in consumer behavior, narrowing capacity of the markets for certain goods and services, marketing efforts from traditional sales channels for goods and services, etc.

3. There is a connection between the indicators of population activity in online trade and the information society development in the Russian Federation, which demonstrates the following:

- development of online trade and digital economy as a whole largely depends on the level of the information society development;

- individual components that make up the information society of the Russian Federation have multidirectional impact on the online trade development, depending on their degree of development, accessibility and relevance in the digital economy era;

- growth in the number of landline broadband and mobile Internet access subscribers has positive impact on the online trade development;

- activity of organizations in the online space is increasing; and

- share of the population and households with mobile communications and Internet access is growing, and so do their activity and confidence when using the Internet to order goods and services.

4. The factors that do not affect the online trade development include the following:

- the number of personal computers in the population or organizations, since the balance of online activity shifts towards mobile devices;

- low activity of the population and organizations when ordering goods and services in the global information environment; and

- the use of nonbroadband Internet access by the population and organizations also limits their activity in online trade;

5. The following factors exert significant deterrent effect on the online trade development:

- high share of organizations in local computer networks;
- restriction of the population and organizations imposed by landline telephony;

- use of landline and mobile cellular networks without Internet access;

- low efficiency of investment in the development of information and telecommunication networks and a low level of subscription fees, which increases the number of subscribers while reducing the Internet bandwidth; and

- intensifying competition in the global information communication space, a weak and deteriorating legal environment for the protection of intellectual property, and a high proportion of pirated software all lead to a drop in the efficiency of investments in areas related to the information and telecommunication technologies development; and

6) Regardless of the weak and deteriorating legal environment and the low efficiency of investment in innovation activities, the process of the information society establishment, development of online trade and digital economy in the Russian Federation have positive dynamics supported by the activity of global players in the online space.

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## Prospects for the Development of Online Trade in the Russian Federation in the Context of Globalization and the Information Society Establishment

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