

# *Formation of Information Society in Modern Russia: Problems and Prospects*

Elena Besedina, Aleksei Michurin

Department of History  
St. Petersburg University  
St. Petersburg, Russia

e.besedina@spbu.ru, a.michurin@spbu.ru

**Abstract**—The article deals with the issues of formation of the information society in Russia in the 21<sup>st</sup> century. The information society is a social system in which the production of goods and services essentially depends on the collection, storage, processing and communication of information. In the information society, the tertiary sphere of services (after agriculture and industry) prevails, where science and education take the leading role. The development of the information society is marked by both a huge positive potential and certain risks that need to be identified, studied and analyzed in due time. The main goal of building the global information society is to improve the lives of people, to create conditions for their highest self-realization. Other particular issues that the Russian Federation is facing in the 21<sup>st</sup> century are also being considered.

**Keywords**—*information society; globalization; concept of formation of the information society; the Russian Federation*

## I. INTRODUCTION

Russia is one of active participants in formation of the information society in the modern world. The current stage of Russian society development can be characterized as a transition from industrial to informational society. D. Bell in the preface to the Russian edition of his book "The Coming of Post-Industrial Society", written in 1998, spoke of Russia's post-industrial chances: "If the country achieved internal stability and escaped devastating ethnic conflicts and civil wars, it would be ready to enter the post-industrial age earlier than any other country"[1]. The historiography of the topic "in the classical sense" has not taken shape yet. However, discussions on the history of the information revolution and the development of the information society are being conducted quite widely. Some influential researchers view the information revolution as a myth when others (they are in majority) speak of a quantum leap in the civilization development.

The information revolution is understood not only as a complex of changes in all spheres of the society. It is a radical change of the instrumental basis, methods of transmitting and storing information, and the amount of information available to the active part of the population in the 20th and 21st centuries. The information revolution is creating a technological basis for uniting the intellectual abilities of the mankind. In the 21st century, scientific institutes and corporations have become the workshops of scientific-

technical progress, which led to the creation of new trends of scientific-technical policy of states, including Russia.

The information revolution led to the transformation of public relations due to fundamental changes in the information processing field. The consequence of such transformation was the acquisition by human society of a new quality, which cannot be ignored in modern Russian society.

## II. RESULTS AND DISCUSSION

The term "information society" in the 21st century firmly established itself in the lexicon of politicians of various levels. The very concept of information society appeared in the second half of the 1960s. The concept of the information society has lots of interpretations. The invention of this term is attributed to the professor of Tokyo Institute of Technology Y. Hayashi. For the first time, the main characteristics of the information society were identified in reports to the Japanese government. In 1972 I. Masuda presented "The Plan for Information Society: A National Goal toward the Year 2000" to the Japanese government. The plan was later issued as a separate publication. Post-industrial issues quickly became one of the leading topics in the western sociology. One of the first authors to introduce this term into scientific discourse was F. Machlup. He did it in his book "The Production and Distribution of Knowledge in the USA" that was published in Russian in 1966. He began to talk about "new economy", which included education, science and innovation, and the industry of information and communication technologies (ICT).

Informational (or post-industrial) society is a designation of a new stage of social development, when the change of various technological eras in the world history is viewed as the foundation for social progress. The concept of the "information society" is a further development of the industrial society theories worked out by French sociologist R. Aron as well as the "stages of economic growth" by American sociologist W. Rostow, popular in the 1960s. Later, the concept of "post-industrial" and "information" society, as a sociological theory, was deeper developed by western researchers, who viewed the post-industrial society as a "civilization of services".

National science turned to this issue much later. This had to do with ideology, in particular, the terms "post-industrial"

and “informational” were seen as an alternative to formational terms “socialist” and “communist”. Russian scientists who made significant contribution to this development are D. V. Ivanov, V. M. Glushkov, N. N. Moiseev, A. I. Rakitov, E. A. Rogovsky, A. V. Sokolov, A. D. Ursul, V. P. Terin and others. Common knowledge in Russian historiography on the topic is an ever-increasing amount of information and new means of communication, in which researchers see new opportunities for modern Russian society. On the other hand, as the information society is forming there are more and more problems, which need to be systematized, and the ways to overcome them need to be shown.

As in case with other countries, Russian way to the information society is determined by its current political, socio-economic and socio-cultural characteristics [2]. These features include insufficiently high (compared to developed countries) level of development of information and communication infrastructure and manufacturing of media, products and services; lack of the state funds for their modernization and expansion; relatively cheap intellectual man power that is able to formulate and solve complex scientific and technical problems. The development of Russian telecommunications of all kinds has outperforming growth rates compared to other areas of economy, which makes it possible to count on the successful formation of the infrastructure for providing information and communication services for the population.

The fourth information revolution of the 1970s, the consequences of which we are experiencing, is associated with new challenges for modern Russia. This period is characterized by three fundamental innovations:

- transition from mechanical and electrical means of converting information to electronic ones;
- miniaturization of all parts, devices, instruments and machines;
- creation of software-controlled devices and processes.

The fourth information revolution is viewed by researchers as a “historical challenge” to modern civilization. It can be said with confidence that one of the most important catalysts for this challenge was the worldwide recognition of the computer network – the Internet. It was the Internet that was able to unite millions of people and hundreds of countries, to shorten geographical distances and eliminate barriers to communication in various areas of human activity. It contributes to the globalization of all changes that are taking place when the events, that are geographically distant from each other, turn out to become the links of one chain losing their local character to some extent.

The fourth information revolution is characterized by a great volume and transmissions speed of the information both produced and consumed. Thus, after the invention of radio, it took 30 years to reach an audience of 50 million people, with television it took 13 years, while with the Internet it took only 4 years.

The latest information revolution brings to the forefront a new sector that is the information industry related to technical

equipment production. Information relations in society have two aspects: technical and substantive. The substantive one is quality of information. The technical one includes existing technical means for transmitting information: e-mail messages, methods of printing, wiring, television and the Internet.

The new information revolution covers all aspects of human life and makes changes irreversible. Under these circumstances there are two options for the transition of Russia to the information society [3].

The first option is to repeat the path that has already been taken or is being taken by other countries, mainly European ones. It requires significant capital investments, is comparatively short in time (no more than 7-10 years before reaching an average European level of informational support under the condition of 2-3% economic growth rate). The speed of movement in this case will be provided by allocated funds (at least 5-7% of GDP).

The second option is finding a path that is focused on purely Russian criteria and the quality of life and other socio-cultural characteristics. In today's socio-economic conditions it would require minimal investments on behalf of the state. However, it assumes at least minimal rates of economic growth, political stability in the society, and willpower of the executive and legislative branches that would set the task of transition to the information society as a high priority one [4].

The basis of the Russian way should be:

1. Informational support of the entire system of education and training: from kindergarten to higher education and subsequent forms of training and retraining of specialists; increasing role of qualification, professionalism and creative abilities as the most important characteristics of human potential [5].
2. Formation and development of the informational industry and communicational services including home computerization focused on mass consumers.
3. Providing the service sector with spiritual content that meets Russian cultural and historical traditions including the organization of a powerful Russian-language Internet segment.

The solution of these three large-scale tasks that are historically important for Russia would mean real transformation of information and knowledge into a true resource of socio-economic and spiritual development [6].

As a result, Russia can also act as a carrier of a specific model of civilization, in many ways correcting the western standard. Historical continuity, national identity, the restoration of moral consciousness, the formation of a single spiritual space of the country – these are the main features of Russia's chosen path to the information society. In general, in terms of the overall volume of information resources, Russia occupies a rather decent position in the world. However, their quality and structure, as well as the degree of utilization, fall behind modern needs. Forming the country's unified information space and the development of the information society are a necessary condition for Russia's integration into

the world community not as a mere supplier of raw materials, but as an equal partner [7]. Besides positive aspects, the information society has all problems that were characteristic of the previous stages of the development of human civilization and it gives rise to some new ones. For Russia with its vast territories the problem of digital divide is the most immediate one in light of the transition to the information society [8].

In the post-industrial society, national information resources are the main economic value, the source of wealth and the most significant capital. Given this, every sovereign state is trying to work out a concept for the development of the information society. The United States did this in 1993. The European Union adopted a plan of action called "Europe's Way to the Information Society" in 1994. It can be argued that all countries in the 21st century started towards the future information society, but each of them did it in its own historical time and is moving forward along its own orbit (although all of them are being forced to take into account the global historical challenges and to respond to them).

"The Concept of Forming the Information Society in Russia" was developed and approved by the State Duma in 1999. "The Information Security Doctrine of the Russian Federation" was approved by President of the Russian Federation Vladimir Putin on September 9, 2000. In 2010 the Russian Federation State program "The Information Society" began to be implemented. It was designed to create a holistic and efficient system for information technology usage [9].

The concept of forming of the information society in Russia defines the following: preconditions for the transition of Russia to this stage of development; fundamental propositions of the concept; socio-cultural grounds of the chosen path, etc. Moreover, the features and possible ways of transition to the information society were analyzed.

Russian way to the information society is preconditioned, as in case with other countries, by its current political, socio-economic and socio-cultural characteristics. These features include:

Insufficiently high (compared to advanced countries) level of development of information and communication infrastructure and industrial production of information tools, products and services, lack of state funds for their modernization and expansion.

Relatively cheap intellectual manpower, which is able to formulate and solve complex scientific and technical problems, whereas enthusiasm remains a driving force to a great degree.

Russia has great cultural heritage and modern original multinational culture, which opens up lots of opportunities to fill information services and products provided to the population with Russian content.

The development of Russian telecommunications of all kinds is advancing at a faster pace than other areas of economic activity, which makes it possible to count on successful formation of the infrastructure for providing information and communication services to the public.

Even today in Russia new information and telecommunication technologies are being created and introduced, unique information resources are used and the culture is naturally forming being generated by the information age. At the beginning of the 21st century there are approximately 7 million Russians who used the Internet for work or for entertainment at least once. The number of people constantly working in the net exceeded 3 million, and in 2010 it was already about 26 million [10]. By all means, this is significantly less than in Europe or the USA, but the development is intense. Free software (27%), computer games (22.5%) and entertainment (22.5%) enjoy great popularity in Russia.

In general, in terms of the total volume of information resources, Russia occupies a noteworthy position in the world. However, the quality and structure of such resources, as well as the degree of their utilization, lag behind modern needs. Therefore, the appeal of the President of the country "not to oversleep the information revolution", which is a part of his annual address to the State Duma of the Russian Federation, is very timely. In his annual address to the Federal Assembly of the Russian Federation in 2004 the President of the Russian Federation pointed out the need to modernize the state so that its functions would comply with the current stage of Russia's development. Forming single information space of the country and the development of the information society is a required condition for Russia's integration into the world community.

Russia signed the "Okinawa Charter on Global Information Society", which was adopted on July 22, 2000 by the leaders of the G8 countries [11]. The documents developed in this regard state that new information and telecommunication technologies significantly:

- expand the rights of the citizens by providing instant access to a variety of information;
- increase people's ability to participate in political decision-making and to monitor government actions;
- provide an opportunity to actively produce information and not just consume it;
- provide means of protecting privacy and anonymity of personal messages and communication.

However, these potential opportunities and benefits of the information environment will not become reality by themselves. Growing state intervention into the field of encryption around the world may threaten personal privacy of the citizens. Convenience, speed of sending and receiving information, various information services can result in losing anonymity and privacy.

An important issue in shaping the foundations of the information society in modern Russia is the attitude towards democracy and equality. Changes in the economic sphere of the information society and its social structure are combined with the emergence of new trends in the political field. There is a number of significant innovations:

- Political parties gradually lose their significance and often disintegrate, as their social base disappears,

which leads to a change in the rules and technologies of the political power struggle.

- Political pluralism based on a multitude of different social groups, parties and movements representing different interests strengthens its position. To a certain extent this prevents various attempts to monopolize power and systems of public affairs management.
- The use of systems that combine the capabilities of computers, telephones, fax machines and television in order to develop democracy allowed a number of western political scientists to announce the beginning of the era of “computer democracy”.

At present stage the Russian Federation has not avoided a number of problems of the information society [12], they even have a sharper and more pronounced character due to the specifics of Russian information space.

One of the new problems was called the “information digital divide”. This is a gap in the level of access to information. Digital information gap exists between continents and countries in the same parts of the world, between different regions within one country, between different types of settlements and between different social strata. The problem of information inequality for Russia with its vast territories is the most urgent one in the light of transition to the information society [13].

The extent of the information technology usage determines changes of social structure not only within one state but also in the world community. Advisor to the President of the Russian Federation on regional economic integration, a full member of the Russian Academy of Sciences Sergey Glazyev theoretically divided the world community into three groups:

1. “Inforichmen” are a part of the population with unlimited access to modern technologies and the greatest influence on the development of information and communication technologies (ICT) using them in their own interests and receiving enormous advantages over all others. “Inforichmen” are the elite of society that includes the largest transnational financial corporations and the most developed countries that invest most of their money in ICT development. These corporations have the most powerful computers and the latest telecommunication systems and technologies for electronic information processing that are being created for them. They can well afford it.
2. The “informational middle class” is a part of the population that actively uses the achievements in the area of electronics in their work and everyday life. These people are characterized by high information culture and possess good ICT skills. This group includes the population of the developed and richest countries in the world with incomes above average. It is these people who are the driving force of the “post-industrialism era”, but they are not the ones who control the flow of information and new technologies. They only try to use them as much as possible and do not constitute the majority of the world population.

3. “Information poor people” are not only those people for whom technology is not available due to their low incomes, but also the part of the society that is not prepared for using ICT. They do not know how or even do not want to use new technologies (people with low information culture). They constitute a large part of the Earth population.

Here are the facts supporting the above stated points. According to the World Bank, the distribution of the world market of information and communication technologies between different regions is rather uneven, which corresponds to their overall level of economic development. Thus, the United States accounts for 34% of the world market, Europe - 29%, Japan - 12%, and the rest of the world - 25% [7]. Russia, no doubt, should occupy a rightful place in this complex information space. However, there are issues of regional, national, gender, religious, age related and other features in the way to overcoming the “information-digital divide” in modern Russia that emerge immediately.

Needless to say, such gaps existed before. However, people hoped that the development of information technology will contribute to the elimination of these differences, but life has proved the opposite to be true. Rapid development of information technology leads to the expansion and deepening of the information-digital divide. Without free access to information that is available for all people there is no point in talking about building the information society, that is, the society of collective intelligence on a planetary scale [14].

In the history of the society development the relationship between science, technology and production evolved on the basis of objective connections. Practice, the needs of production has always had a leading impact on science. In the context of the development of the modern Scientific and Technological Revolution (STR), primarily related to information, this relationship is radically changed. Science, becoming the immediate productive force of society, in many respects begins to determine the growth of its effectiveness. Against this background, the effect of the achievements of Scientific and Technological Progress (STP) on the relationship in the “Man-Society-Nature” system deserves special consideration. And here we can say that the rapid development of scientific and technical progress has led to the exacerbation of the global problems of our time.

Awareness of this leads to an understanding of the foundations of the scientific and technical policy of Russia in the conditions of the formation of the “information society”. In March 2002, a new stage in the development of conceptual and regulatory foundations of science and technology policy began with the approval of the “Basic Principles of the Russian Federation Policy on the Development of Science and Technology for the Period to 2010 and beyond”. This document has become an important milestone marking the transition from the policy of preserving the scientific and technological potential to its reproduction in the formation context of the national innovation system. It identified priorities and mechanisms for their implementation. The main provisions of the “Basic Principles” were developed in programs and strategies, in particular in the “Strategy - 2015”.

There was a restructuring of management structures. By the end of the first decade of the 21st century, significant steps were taken in the direction of increasing and streamlining the financing of the scientific and technical sphere, as well as strengthening the national innovation system. However, in conditions of high rates of inflation, the real increase in spending on science was not enough for the innovation component of the economy. In 2006, the following conceptual documents were adopted: "The Strategy of Development of Science and Innovations in the Russian Federation for the Period up to 2015" and the "Concept of the Long-term Social and Economic Development of the Russian Federation". They were aimed at creating a balanced research and development sector, increasing the efficiency of all components of the innovation system. An analysis of strategic documents approved in subsequent years shows that the list of priority areas has been reduced, the main problems of the country's scientific and technological complex are more clearly identified. The lists of critical technologies, approved by the President of the Russian Federation and adjustable priority directions of development of science and technology, began to play an increasingly important role in determining the state policy in the field of the national innovation system. However, the effect of innovation in the country is hardly noticeable. If in 2001 there were 44 thousand enterprises and organizations of high-tech business, in 2004 there were 28 thousand, in 2006 – only 22 thousand. In April 2008, the share of industrial enterprises engaged in the development and introduction of technological innovations did not exceed 10%.

The study of government documents of 2008-2011 allows us to talk about the realization by the authorities of the importance of building up intellectual resources, more efficient use and management of them as one of the most important factors for the successful formation of scientific research in Russia. These documents define the following priorities: optimization of the age and qualification balance of the scientific and technical personnel potential; formation of an effective system of reproduction, promotion and updating of scientific and scientific-pedagogical personnel; increasing the number of scientists and educators using the best practices of leading world universities; increasing the quantity and quality of scientific publications; stimulation of social mobility of scientific and scientific-pedagogical personnel.

The movement of Russia to the information society and the innovation economy is making new demands on the formation of specialists in the field of engineering and technology. The Higher Technical School is designed to create conditions for the evolutionary cultivation of a new generation of highly educated engineering professionals who are able to realize the sustainable dynamic development of a competitive economy and the breakthrough development of various areas of practice based on high educational and knowledge-intensive technologies. Modern engineering training should ensure the efficiency and effectiveness of the chain: "research - design - technology - manufacturing - bringing to the final consumer - ensuring operation". At the same time, there is a reduction in the output of specialists in the field of engineering and technology in Russia. A number of specialties were not demanded by the labor market - about half of the graduates of

engineering universities were employed not by their profile. The process of "brain drain", which reached its climax by the beginning of the 21st century, gained momentum. State policy in this area was distinguished by inconsistency and chronic failure to realize what was intended. Chairman of the Accounts Chamber of the Russian Federation Sergey Stepashin in January 2011 declared that about 1.25 million Russians are now working abroad, which is approximately equal to the number of people who emigrated after the revolutionary events of 1917; first of all, these are scientists and educated specialists.

There are also other problems which Russia must deal with in the modern unstable world:

- Net war is a form of social conflict, in which participants use the methods of network organization, network strategy and technology. Participants in the net war are scattered in form of small groups that communicate, coordinate their activities and conduct joint events.
- The rapid spread of local economic disruptions (financial crises of 1997–1998, the US mortgage crisis of 2007–2008, etc.).
- The risk of pushing the poorest countries to the side of the world economy.
- The danger of imposing other values and models without due regard for national specifics and concrete conditions of economic development of different countries.
- The growth of national organized crime into international, i.e. the spread of terrorism.

The global net war today is the main problem and content of world politics [15]. In such war there are no front lines or clear state borders, there are no barriers, no zones of influence of national administrations. Public conscience becomes the main object of impact. We lived through different epochs of war: states against states, we survived the ideological struggle of two world camps – capitalist and socialist. In the "state-to-state" war model Russia can win, but there is a big question if the Russian Federation can win the ideological war, which is the basis of the net war. The answer to this question depends on current work in the information space.

The progressing globalization of the information society raises a whole layer of questions in the area of international relations [16]. As many influential political analysts in different countries of the world have noted, for the first time in the last few centuries the state is no longer coping with new problems and is losing its power. German researcher Ulrich Beck suggested looking at this process through the lens of the erosion of politics boundaries in modern society [17]. There are already versions of "limited sovereignty", "humanitarian intervention", "the priority of personal security over that of the state" and others. The problem is certainly much deeper. What global rules are going to be implemented: the Treaty of Westphalia (1648) that for more than three hundred years has proclaimed the principle of state's sovereignty over the territory, or the modern revolutionary principle of a nation's

self-determination living in certain territory? This problem is typical for modern Russia as well.

Balance between globalization and national interests and state sovereignty in the era of the information society is one of the essential problems of the international relations. Respect for sovereignty of the state and national interests should remain the main principle of international life. The perspective of the 21st century is the enforcement of this principle. No global system of the information society is going to be viable if it is not built on the co-operation of states, which is also emphasized by political leaders of modern Russia.

### III. CONCLUSION

The information society is a social system in which the production of goods and services essentially depends on the collection, storage, processing and transmission of information. If industrialization made it possible to produce a huge amount of goods, then the advent of the information (computer) technologies era provided an opportunity to produce, process and transmit huge amounts of information. In the information society the tertiary sphere dominates (after agriculture and industry), that is, services, where science and education have the leading role.

Technical innovation tends to accelerate and that is true about Russia as well. The information society has a huge positive potential, contributing to the solution of many social problems, as well as certain risks, hazards and contradictions that must be promptly identified, studied and analyzed. We must not forget that the main goal of building the 21st century global information society, that includes Russia, is to improve people's lives and to create conditions for their highest self-realization. It can be achieved only if the key principle is observed, that is, any development should be based not on objects, but on people.

As for Russia, there is confidence that the country will take the lead in the post-industrial information society and occupy its rightful place among other free nations.

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