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# The Role of Information and Informational and Communication Technologies in Modern Society

*El papel de la información y las tecnologías de la información y la comunicación en la sociedad moderna*

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### ABSTRACT

The article presents the results of a study that determines the role of informational, communication and computer technologies in the development of modern society. The problems of the influence of informational, communication and computer technologies are considered in the framework of three theoretical and methodological approaches: technocratic, information and informational technology recognizes as a means of optimizing production and increasing labor productivity; humanistic, information is considered as one of the resources that have a positive impact on the development of all spheres of life; techno-pessimistic, information, informational and computer technologies are considered as weapons directed against humanity.

**Keywords:** Informational technology; intellectual environment; stability factor; threat to humanity.

### RESUMEN

El artículo presenta los resultados de un estudio que determina el papel de las tecnologías de la información, la comunicación y las tecnologías de computador en el desarrollo de la sociedad moderna. Los problemas de la influencia de las tecnologías de la información, la comunicación y la computación se consideran en el marco de tres enfoques teóricos y metodológicos: la tecnología tecnocrática, la información y la tecnología de la información se reconoce como un medio para la capacidad de producción y el aumento de la pelea laboral; humanista, la información es considerada como uno de los recursos que tienen un impacto positivo en el desarrollo de todas las esferas de la vida; las tecnologías tecno-pesimistas, informáticas son consideradas como armas dirigidas contra la humanidad.

**Palabras clave:** Tecnología de la información; entorno intelectual; factor de estabilidad; amenaza a la humanidad.

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## **INTRODUCTION**

The problem of transmission, processing and preservation of information has been and still remains relevant throughout the human history. In ancient times, rock carvings were used as information, and cliffs, cave walls served as information carriers. The fundamentals of the scientific theory of information were laid by K. Shenon, who views information as "the removed uncertainty of knowledge about something" (Shenon, 1963). Among the set of definitions, the most common one is the definition by N. Wiener, in the interpretation of which, information is the exchange of messages, it is "the content of material obtained from the outside world in the process of adaptation of a person to it" (Wiener, 1983). In the broadest sense, information is data about the objective world received by a person in the process of cognition, transmitted through signals, symbols, and signs. Within the framework of the informational concept, the phase in which modern society is located is called the information.

Having entered the information age, the society actively uses information and communication technologies, automates and robotizes all branches of production, creates an integrative communication system, improves information sources and carriers, which led to its radical transformation. With the formation of the information society, an information and communication and economic space was formed that transformed information into one of the most important resources for the development of society. The active introduction of information and computer technologies, spread of information and communication networks, contribute to the formation of a global information and communication environment that covers the entire planet. Information and communication space is gradually becoming the medium of information influence on the mind of the masses. Influenced by information and computer technology, the structure of society is radically changing, and communicative relations are undergoing changes. The active spread of information, communication and computer technologies and their impact on society is becoming one of the interdisciplinary research problems, since it is directly related to the problem of the future of humankind.

## **SUBJECTS AND METHODS**

In characterizing modern society, the concept of "information society" is widely used, which was introduced by a scientist from Japan Yu. Hayashi in 1969. The concept of the information society developed gradually, forming the scientific direction "information philosophy", exploring the problems of applying information-theoretical and computing technologies to the problems of philosophy. In modern society, the issues of transfer and preservation of information and its impact on public consciousness are especially relevant. The philosophical concept of the information society as a result of dialectical analysis of social, cultural, technological foundations is the basis for the development of information and informational technologies. From a philosophical point of view, the entire objectively existing world has an information structure. Information, embodied in knowledge, or in technology, becomes a product and a reflection of social being, having a certain impact on the public consciousness.

The research is based on the principles of the system approach, due to which the information society is considered as a system. The information concept is based on the following statement: information is a universal category that is the basis of the existing reality (Dyatlov, 1995). To study the information society, the methodology of scientific research is used, the basis of which is the method of information content analysis. The use of this method allows revealing the patterns of development of information technologies and their influence on the dynamics of socio-cultural processes.

## **RESULTS AND DISCUSSION**

A characteristic feature of the modern information society is the growth of knowledge, the transformation of information into the main subject of human labor. Today, it can be confidently stated that in the era of information technology and high-tech production, information production becomes one of the types of manufacturing industry, and science becomes a productive force. Informational society is based on information and a well-developed network of services. This has affected all spheres of society: education, health, cultural institutions, whose members either receive or provide information, transferring their knowledge as a service. Rapid development of Internet technologies has opened new ways of organizing business relations at different levels. Through the Internet and web technologies, new ways of financial calculations, electronic payments appeared, as well as the ability to make purchases, receive various services. Information and communication technologies are used as a means of intercultural communication, which has broadened the opportunities for citizens to communicate with each other throughout our planet on forums, websites, and blogs.

The use of information and computer technologies enhances the ability of citizens to participate in municipal or state governance, makes it possible to assess events happening in the country and abroad. According to sociological research, approximately 50% of Russia's population are covered by information and communication. It should be noted that residents of some regions and remote settlements do not have the opportunity to use information technology. This creates prerequisites for increasing the political, social inequality of citizens. In this regard, the Government of the Russian Federation created the program "Electronic Russia", the main purpose of which was to overcome information inequality, granting the citizens a right to access information and communication networks. This program was implemented until 2010, and, in general, certain results were achieved. During 2002-2010, pilot projects were implemented, infrastructure was formed, the information and communication network was expanded. Informatization of public administration was actively carried out, information technologies were introduced into production, points for collective use of the Internet were created, and personnel were formed and developed. During this period, electronic document management programs were implemented, government portals were created, where citizens of the country could obtain the necessary information, apply, and make an offer.

With the development of telecommunications and the Internet, it became possible to integrate them into educational activities. One of the large-scale projects implemented in life is distance learning. The use of information and communication technologies makes it possible to carry out the process of interaction between the teacher and students at a distance. Two kinds of educational technology are the most developed: synchronous and asynchronous. The most common synchronous technologies include webinars, on-line lectures, on-line consultations. Efforts are focused on the creation of audiovisual texts. Asynchronous include electronic textbooks, virtual laboratories, computer simulators. To check knowledge, testing is used: to fix knowledge, electronic statements, journals are used. Distance education provides an opportunity to get education for people with disabilities, and those who live remotely from large cities, or who are on long expeditions. Particular attention is paid to providing educational institutions with multimedia, electronic and information resources.

To date, most of the projects have been implemented. Local, regional networks are being introduced, the global network is being improved. Russian specialists are working to implement programs that ensure the security of personal information of citizens and the information security of the state. Also, developments are under way to create programs that provide censorship, control over information placed on portals and Internet sites. Work is in progress on active implementation of information, computer technologies into production.

In philosophical discourse, there is no unified approach to assessing advances in information and informational technology. A huge layer of research of the problems of information, communication and

computer technology is composed of works that have two vectors in determining the assessment of the qualitative changes taking place in the modern informational society under their influence. Supporters of technological determinism D. Bell, E. Masuda, N. Moiseev consider the information society as a new stage in human evolution, a new type of communication links. They idealize the newest technologies, considering information technologies as the determinative factor of the progress of the world civilization. According to them, it is information-communicative and computer technologies that contribute to the positive dynamics of social development.

The opposite position is taken by K. Jaspers, A. Peccei, who deny the potential capabilities of technology and information and communication technologies in social progress. They call technics and information technology a factor that determines the instability of modern society. They voice the idea that all the processes associated with the active implementation of technics and technology are humanity's doom. A. Peccei (1985), M. Castells (1999), E. Toffler (2010), believe that current technology is turning into an uncontrollable factor, bringing a modern society closer to the point of bifurcation, capable of destroying humankind.

In contrast to them, the supporters of the theory of the information society J. Masuda (1997), A. Popov (2007) believe that all the positive processes of the development of society are caused precisely by information and communication technologies and computer technologies. These researchers argue that the information technology improves due to the needs of material production, and the accumulation of information is an indicator of social progress. They call information the main value of modern society, capable of acquiring the significance of value. We agree with W. Martin (1993) that the quality of life has changed under the "influence of achievements in the field of information", the prospects for social and economic development have been opened, and the standards of work and rest have changed.

In modern society, information becomes an industrial product, and its production is one of the types of industry. Information and informational and communication technologies are becoming one of the sources of labor productivity and power. People have access to an unlimited amount of information, knowledge of which allows them to build communication with the entire international community. Knowledge of certain information makes it possible to control the society, to influence the public consciousness. In modern society, a new type of information culture is formed, called the "screen culture" of communication, which allows one to conduct a dialogue with people living in all parts of the world. "Screen culture" contributes to the formation of thinking, harmonization of the inner world. The information environment creates conditions not only for intellectual development of a person, but also for acquiring a new type of activity, improving the financial situation, it allows people with disabilities to adapt socially. Due to the implementation of new technologies, the contradictions between production and consumption are gradually eliminated; the structure of employment is changing. "Electronic cottages" (Toffler, 2010), become a reality, transferring working places from the office to your home.

In modern society, due to the wide implementation of information and digital technologies, progress has been made in all branches of science and production, the latest technologies of augmented reality become widespread. The technology of augmented reality is the projection of various information: texts, video, graphics, audio-material on top of the real-time screen in real time. The term "augmented reality" was proposed by the researcher T. Codelet in 1990, which means some space between reality and virtuality. Augmented reality is the implementation of virtual information, perceived as a part/element of real life, into real life. Augmented reality is represented by portable devices, stationary devices (glasses, helmets, smartphones, suits, printers), that are actively entering the entertainment industry, into production. Projection systems that do not require powerful screens, imposing an image on any surface are actively used. Using the augmented reality in production allows one to present information in the form of three-dimensional graphics, animation, and video. In production, this allows ensuring the safety of labor,

increasing labor productivity, shortening staff training time. Augmented reality is used in large concerns at aircraft, cars and other large-sized objects assembling, which reduced the time for assembly, reduced the number of errors, and therefore increased the quality of products.

The introduction of information and computer technologies contributes to the active development of the world economy, formation of the world financial system, electronic labor exchanges, which influenced the formation of a global information society. This is confirmed by the existence of a "World Wide Web" (Internet, Skype, e-mail), allowing at any time to contact the organization or person living anywhere in the world. Digital processing of various sources of information, the process of information exchange has no spatial and geopolitical boundaries, contributing to the interpenetration of cultures, which does not allow preserving the identity of the culture of individual ethnic groups. Information and computer technologies contribute to the creation of cyber space, as a tool for manipulating people's consciousness. The Internet is often used to propagate distorted, falsified information in order to manipulate public consciousness. On the Internet, the information is transmitted in the mode of interactivity and in the absence of censorship. A person, having received it, independently processes, evaluates, falling under the influence of propaganda ideas, changes the system of values, mindset. With the formation of a global information environment, hacker attacks and cyberterrorism are actively used, creating the opportunity for information wars against any state. Information wars use the global information environment as a battlefield, processing and falsifying information.

So, the active implementation of information, communication and computer technologies into the life of modern society is ambivalent in its nature. There is no doubt that implementation and spread of information, communication and computer technologies in modern society has brought a lot of positive, in particular:

- 1) new structures were formed with new ways of providing information: e-government, public services, digital and interactive television, electronic document turnover, e-mail, which allowed to optimize the activity of these structures;
- 2) information has a positive impact on modernization processes in the social sphere, politics, culture; becomes one of the main resources of economic development;
- 3) computerization of industries, and other areas has allowed to optimize their activities, increase their productivity;
- 4) new professions are being formed: analysts, programmers, web designers, involved in collecting, processing, transmitting information;
- 5) spread of information and computer technologies has made it possible to create contacts between partners, which saves their time and resources;
- 6) information technologies have changed traditional activities (private business at home, "electronic cottages" (Toffler, 2010);
- 7) information becomes one of the basic values of modern society. Knowledge and information become the main factor of the economic well-being of society, and, consequently, a factor of stability and sustainable development of society.

Noting the positive dynamics in the development of modern society, one cannot but note the negative manifestations that arise in the process of active implementation of information technologies:

- 1) information, informational technologies become a factor in the globalization of society, creating a single world information space, the global economics;
- 2) television, mobile computer networks providing information to the inhabitants of the planet, standardizes the language, thinking, which leads to a decrease in the intellectual level;
- 3) spread of uniform (identical) information leads to the unification of mass consciousness;

- 4) lack of ability of the younger generation to filter out information becomes the reason for the formation of imaginary values (simulacrum);
- 5) negative information spreading in the information field, contributes to the development of negative attitudes, which neutralizes the moral and ethical principles, changes the mindset;
- 6) a negative manifestation is the Internet addiction leading to the violation of interpersonal relationships, to social exclusion, to health problems;
- 7) information has become a commodity, it is bought and sold;
- 8) the number of crimes in the field of information technology has increased;
- 9) computer games that demonstrate scenes of violence, contribute to the formation of aggression, cruelty;
- 10) longstanding sitting in front of the computer has a negative impact on lifestyle and on health;
- 11) information turned into a weapon of "mass destruction", it is used to spread the ideas of radical nationalism, extremism, religious fundamentalism.
- 12) unauthorized access to servers allows one to hack and disable the electronic control systems of the country, which is aimed at the destruction of states;
- 13) lack of a legislative framework in the field of information technology promotes the spread of indecent material in social networks, the creation of sites dangerous to life.

From our point of view, the solution of the problem can be possible within the framework of three theoretical and methodological approaches:

- technocratic, considering information and informational technology as a means of optimizing and increasing labor productivity;
- humanistic, considering information and informational technologies as one of the resources positively affecting the development of the economics, social and spiritual spheres;
- techno-pessimistic, considering information, information-communicative and computer technologies as weapons directed against a person.

## CONCLUSION

While revealing a number of negative consequences in the process of introduction of information and computer technologies, it should be recognized that it was these technologies that opened new prospects for the progressive development of modern society. Due to the latest technologies, humankind has been able not only to preserve and spread information, but also to use it in solving global problems and predicting the future (Isachenko, 2017). Information as a value becomes one of the regulators that influence the sociocultural changes in society.

In connection with the identified problems, it is necessary to develop a strategy for the further development of the information society and the use of information, communication and computer technologies. We offer the following measures that would minimize the negative influence of information and computer technology on society.

1. Create a legislative framework regulating the activities of the Internet, social networks.
2. All projects that are implemented in the system of information and communication and computer technologies should form the citizens' moral principles, human values.
4. In the process of spread of information, communication and computer technologies, it is necessary to pay great attention to the creation of an "intellectual environment" in the formation of the "information sphere".

In this article, an attempt was made to draw attention to the problems that arise in the process of the active spread of information, communication and computer technologies in the modern society. General approaches to solving this problem were offered.

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