

PHILOSOPHICAL SCIENCES

INTERNAL REGULARITIES OF FUNCTIONING AND DEVELOPMENT OF THE INFOCOMMUNICATION TECHNOLOGY SYSTEM

Mishuk S.

*Belarusian Scientific Research Institute of Documentation and Archival affairs,
Department of Archives and Records Management*

Ministry of Justice, Republic of Belarus

Deputy Director for Research

Ph.D. in Philosophy, Associate Professor

Minsk

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Abstract

The article analyses the internal regularities of functioning and development of the system of info-communication technologies at the present stage of human civilisation development. The significance of this system as a naturally occurring element in the structure of the noosphere is revealed. The importance of these technologies as the basis of the global cognition system that turns the Earth into a subject of the Universe and allows each person to participate in the global thought process is shown.

Keywords: noosphere, civilization, information society, infocommunication technologies, global cognition system.

The concept used to define the current stage of human civilisation development - 'information society' - quite accurately and correctly, in our opinion, reveals the essential properties of the current stage of human civilisation development. It is knowledge and information in the broad sense that increasingly determine the degree of humanity's impact on its natural environment, ensure its transcendence beyond the earthly boundaries and at the same time serve as the most important factor in solving problems arising in the process of functioning of the global social organism.

It is obvious that the system of information and communication technologies as the core of the information society includes various structural and functional components (technical devices, software, a corresponding set of services, etc.). However, its most important and primary goal is to ensure information exchange. The degree of implementation of this goal determines the overall importance of the ICT system in the processes of human civilisation. Besides, the development of other elements of this system also depends on the efficiency of this function. Moreover, as the info-communication environment is formed, its essential properties become more and more vivid; the components ensuring their realisation are the most dynamic. They themselves ensure accelerated development of its other elements.

The study of the sphere of information and communication technologies as a necessary component and, at the same time, an important stage in the development of the noosphere allows us to trace its inherent internal regularities of functioning quite clearly.

The ICT sphere understood in this context, should be regarded as a global system in essence and form of existence. Accordingly, its main essential properties also begin to manifest themselves in due measure when it reaches the planetary scale in its development, covers, as a full-fledged shell, the entire Earth, providing

a qualitatively new level of communications. Accordingly, until the sector of info-communication technologies has not passed the necessary stages of development, has not formed sufficiently, its essential characteristics do not manifest themselves in an obvious form. Until they reach the global level within the planet, they are present in a hidden, undeveloped state; they are rather virtual than real.

In this context, the formation and development of the system of info-communication technologies should be considered as a natural stage in the development of the noosphere. The term 'noosphere' was introduced into scientific circulation by Teilhard de Chardin [1, p. 27]. However, the holistic theory of noosphere as a special shell of the Earth was developed in the works of V.I. Vernadsky [2, p. 15]. The noosphere, understood by V.I. Vernadsky as a 'reasonable' shell of the Earth, assumes and, at the same time, should provide not only a potential but also a real opportunity for everyone to participate in the planetary thought process [3, p. 72]. This characteristic turns out to be more important than a disparate set of individual, even if brilliant people. Therefore, the essential properties that must be realised with necessity in the process of functioning of such a global system are fundamentally important.

Firstly, by definition, the functioning of the noosphere is directly and directly connected with the thinking activity of both an individual person and mankind as a whole. The very products of human thought, taken in 'pure' form, should increasingly manifest their value not only in figurative, but also in the direct sense. Knowledge itself must acquire market value.

Secondly, planetary communication systems, which ensure the dynamic unity of the functioning thought of mankind, must develop at a faster pace. A constant increase in the volume of transmitted information is a necessary condition for achieving a qualita-

tively new level of humanity's awareness of the problems it faces and finding effective ways and means of solving them.

Thirdly, each subject of the global thought process should have the possibility of permanent access to the above-mentioned global system, free from spatial and temporal limitations. The inclusion of as many people as possible in the universal planetary flow of thought is ultimately more important for the sustainable progressive development of mankind than the task of enhancing the intellectual abilities of individuals by technical means.

In other words, the systemic characteristics of the sphere of info-communication technologies [4, p. 257] are in the foreground, rather than the means that strengthen its individual elements.

Let us try to consider the realisation of these essential properties of the sphere of info-communication technologies in the historical process of its origin and development.

The very system of modern information and communication technologies gradually grows out of the 'traditional' technical component of the economic and scientific spheres of society, the formation of which began with the industrial revolution. And initially it does not seem to differ from the structures already existing in the above-mentioned spheres. However, this system potentially contains qualitative differences, which become more and more apparent over time.

Initially these processes start with the appearance of large computers localised in special computing centres. The main value here falls on the technical components of electronic-computer complexes. That is, the most valuable initially is the technical component, in which the achievements of science of this period are realised and human knowledge is 'defined'. But over time, the proportion between 'object-realised' and 'pure' knowledge begins to change in favour of the latter. The intellectual component begins to directly and directly manifest its own value, to acquire an obvious, clearly fixed, rather than indirect price on the market. Already the initial spread of personal computers demonstrates a previously unknown and psychologically unfamiliar economic situation. The cost of acquiring licensed software turns out to be, although not the largest, a very visible cost element; its cost starts at ten per cent of the cost of the computer itself. This very fact initially creates certain socio-psychological problems, as it is not very clear what exactly needs to be paid for and how to fix this object of purchase and sale.

However, rather quickly it turns out that the effectiveness of the introduction of personal computers does not give the expected effect, and is very far from the predictions of science-fiction and futurologists. In the 80s in the USA it was directly noted that personal computers are used mainly as electronic typewriters, and the possibilities inherent in them are irrelevant for the majority of users. That is, the appearance of a large number of terminal devices that strengthen the person possessing them did not bring the expected effect precisely because they remained disparate, not permanently connected with each other. It was required to turn them into

elements of a single system, i.e. to give each of them a certain global characteristic.

This process happens quite quickly in the scales of history: local networks and the global network - the Internet - appear. It is the appearance of the latter that completes this stage of development of the info-communication technologies system, when the latter reaches the global level of development, i.e. turns into a truly worldwide network of information exchange.

To reach this level, firstly, a completely new level of telecommunication means (both technical and software) was required, secondly, new software means and, thirdly, special services for their maintenance. It is these components of the ICT system that have gradually come to the fore as compared to the terminal devices.

Let us try to illustrate these processes in concrete figures. It should be noted that the cost characteristics of the components of the info-communication technologies sector can differ in value by one and a half to two times in different sources. (Some elements, such as the number of mobile phones and smartphones currently in use, cannot be accurately estimated at all). This is particularly evident in analyses of the current state of affairs in this area. Therefore, let us take the years 2009-2010 as an example, in the assessment of which there is a relative unity of views.

Thus, according to Gartner, the volume of the global services market was 3.4 trillion US dollars (some estimate it at 3.6 trillion US dollars). However, computers themselves, i.e. the main component of the ICT market in the second half of the 1990s, accounted for 353 billion US dollars, and the purchase of licensed software - 232 billion US dollars, i.e. the cost of purchased standard software was already 65.7% of the cost of computers, compared to 10% in the mid-90s.

However, the total cost of computers and the software required for them was significantly less than the cost of IT services. Consumer spending on the last component of the info-communication technologies sector, representing 'pure' human labour and 'pure' knowledge, was 40% higher and amounted to USD 821 billion. And about \$100 billion was spent on hardware support, while the rest was spent on ICT consulting, consumer-specific software development and support. And about one-third of IT services spending was on information services within companies.

But all of the above costs were less than what was required for such a component of the ICT system as telecommunications. Their cost amounted to 1.9 trillion USD, i.e. more than 55 per cent of all expenditures on the information and communication technology system in the world.

In other words, already about twenty years after the beginning of mass distribution of personal computers, their cost was only about 10 per cent of all info-communication expenditures. And the cost of basic software for them and IT services, i.e. 'pure' thinking products, exceeded the cost of computers three times.

Such a rapid development of the latter is obviously a reflection of the essential regularities of the information and communication technologies system functioning as a necessary component of the noosphere [5,

p. 378-379]. Human knowledge, human thought are the most dynamic of the known processes. Therefore, they should develop ahead of all other components of reality. And the inclusion of hundreds of millions and billions of living people in this process accelerates it many times.

However, in our opinion, there are also factors, purely socio-economic in nature, which cause such a rapid development of these components of the system of info-communication technologies.

First of all, it does not require large investments for job creation. In manufacturing industries, in machine building, the cost of fixed assets is many times higher than the cost of labour force; tens and hundreds of thousands of US dollars are required to create one job. And in the sphere of information and communication technologies the monthly salary of a programmer exceeds the cost of technical means necessary for his effective work. Moreover, these means can be used practically round the clock, which further reduces the required initial capital investments. And often such investments are not required at all, as the programmer uses his own computer.

Further, the very nature of work determines a rather high cost of the produced product, since the latter is quite unique [6, p. 39]. Therefore, this type of activity is highly profitable and provides a quick return on investment. Of course, it requires sufficiently educated and professionally trained people, but it does not require more time than in other areas of human activity.

An important factor is also, in our opinion, the absence of territorial restrictions in attracting the necessary employees. Info-communication technologies themselves ensure the formation, in fact, of a single world market of labour force of this profile. A person can perform the received task remotely; he/she does not need a specific workplace. As a result, both spatial and time constraints on attracting the necessary employees are eliminated, i.e. the importance of a person as the main productive force is fully manifested. In fact, the employer can use the world's resources, the world's mind, to create a product that is thought-provoking in nature in a local space.

Finally, it is necessary to note one more factor of economic efficiency of this particular component of the information and communication technologies system. The capitalisation of companies engaged in this sector of the economy depends to a very large extent on the information support of their activities, a well-functioning system of PR-connections, advertising and marketing component. In other words, their valuation depends

very much on some virtual factors. And the latter can be directly influenced, as these companies work in this sphere. Therefore, there are many examples of how purely advertising actions allowed to significantly increase the stock exchange value of such companies, providing them with an inflow of new money and, as a result, leading to significant real financial success.

Thus, more than twenty years of development of the system of information and communication technologies have clearly revealed several regularities following from its internal essential characteristics.

Firstly, in the functioning of this system the components in which the results of the human mind's activity are manifested in 'pure' form (development of various kinds of software, IT services, etc.) play an increasing role.

Secondly, the production and use of mobile means, which allow each person to be involved in the functioning of the 'global mind', are gradually coming to the fore.

And, thirdly, there is an ever-increasing need for new communication capabilities, which give the ICT sphere a truly systemic character. And it is the systemic properties of this element of the noosphere that give the necessary impulses to its development and ensure the efficiency of the latter.

The manifestation of the above-mentioned regularities becomes more and more obvious as the modern system of information and communication technologies as the core of the information society develops.

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