Information Technologies in the Context of Forming the Synergy of Post-industrial Consciousness and Digital Economy

Natalya V. Vlasova, Dmitry V. Kuznetsov, Shamsaddin Z. Mehdiev, Ekaterina S. Timofeeva, and Maxim S. Chistyakov

Financial University under the Government of the Russian Federation, Vladimir Branch, Vladimir, Russia
{NVVlasova,DVKuznetsov,SZMekhdiev,ESTimofeeva, mschistyakov}@fa.ru

Abstract. In the collective author’s work on the basis of general scientific methodological approaches, the revolutionary transformation of modern civilization into the format of a post-industrial state and network thinking under the influence of information technologies is considered, taking into account the relevance of awareness of threats to humanity during the convergence of digitalization into everyday reality. The main approach is a theoretical analysis of the impact of modern information technologies and their extrapolation to the near future of civilization from the point of view of the feasibility of creating favorable conditions for life, human improvement from the standpoint of improving moral, ethical, psychological and intellectual qualities. The results, which were obtained, can be used from the position of an interdisciplinary approach as a subjective scientific position of the authors of the article on the evolution of the post-industrial society and the assessment of possible variations in the development of the post-industrial economy on the platform of information technologies, which are part of the convergent ones that form the basis of the VI technological order of the IV industrial revolution. The authors explain that the reasoning given in the article isn’t a dogma and can be transformed directly by the spokesmen of these opinions and by other authors of other works on the topic of post-industrial development in the process of scientific discussions.

Keywords: Postindustrial society · Information technology · Digital economy · NBIC convergence · Artificial intelligence

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1 Introduction

In modern reality, it’s already impossible to imagine the functioning of the economy in isolation from information technologies, which are included in the so-called convergent technologies. The digital economy is a part of economic relations based on modern
technologies and appropriate infrastructure, including technology that forms the network and information configuration of modern communications and information communication systems.

2 Materials and Methods

The theoretical and methodological basis of this work is based on the conceptual scientific provisions and the results of research studies of scientists from domestic and foreign schools dedicated to the evolutionary formation of technological structures, the development of modern society in the context of the philosophical and conceptual aspects of the post-industrial format, considered through the prism of the convergence quintessence of NBIC technologies that make up platform foundation of the VI technological order of the IV industrial revolution. General scientific methods of cognition (dialectical, systemic, complex, method of comparative analysis, method of scientific abstraction, synthesis, analysis, modeling, decomposition) served as the research toolkit.

3 Results

In 1959, Harvard University professor Daniel Bell introduced the definition of «post-industrial society» into terminological circulation (Bell 2004). In sociology and economic science, the specified terminological link expresses the evolutionary transformations of the social structure of the economically and industrially developed states of the world during the last third of the XX - early XXI centuries, including time from a social perspective. The classical theory of post-industrial society, which was formulated by a scientist (period 60–70 years of XX century), contributed to the emergence by 1970 of a terminological apparatus in the first approximation close in semantic load to the society of post-industrial development: a conventional (self-organizing), organized, programmed, information society.

The concept of the post-industrial era is based on the differentiation of evolutionary development into three stages:

✓ Pre-industrial (agrarian) - characterized by agricultural production with the dominant role of the church and the army;
✓ Industrial - a significant component has already determined by industrial potential. The main building blocks are corporations and firms;
✓ Postindustrial - the platform basis is formed by theoretical knowledge. The defining element of their generation is the university.

We are witnessing the emergence of an information («network») society («E-society») of a post-industrial world order, in which the activity of an individual is increasingly associated with a virtual space, which opens up for humanity not only a range of opportunities and development prospects, but also activates secret threats as a component an attribute of the new technological image of civilization and the «network» consciousness of the knowledge economy, which can be verified as a «risk
society». In this regard, information security is becoming a necessary factor in the existence and development of society in the new realities of the digital format of the post-industrial structure.

The digital economy (DEC) is an intensively developing area of economic knowledge. This definition is used in their professional activities by both heads of state, regions (governors), representatives of the deputy corps of various levels, politicians, journalists and the teaching staff of higher educational institutions.

In retrospect, the evolution of the economy of the information society is counted from the era that can be characterized as the era of information transformations, originating progressively from the period of mechanical and analog-electronic technologies to information-digital (Abilov 2008; Castells 2000; Kostyuk et al. 2000).

According to the irreplaceable president and founder of the World Economic Forum in Davos, Klaus Martin Schwab, the III industrial revolution, which began in the 60s of the XX century, takes the form of a digital (computer) revolution (Schwab 2017).

The term «digital economy» was introduced into scientific circulation in 1995 by the American computer scientist N. Negroponte (www.phoenix.edu). We can note that the World Bank experts consider this definition from the point of view of generalized formats: «digital economy is a new paradigm of accelerated economic development» (Silin and Animitsa 2008).

In this context, it’s necessary to formulate the level of technological development, which will contrast in different states depending on the volume of national economies and their complexity that will predetermine the choice and adherence to strategic objectives. Nevertheless, practically all states in foresight forecasts consider their countries in terms of the competitive advantages of digital industrial development.

Those, «Industry 4.0» is a modern stage of industrial development, the basis of which is the development and formation of an innovative format in the economy of high technologies in industrial production and servicing human needs (services).

Information technologies in convergence with high technologies transform the habitually established format of society, which implies the need to implement measures to preserve the habitual place of man at the level of the biosphere and info sphere of the planet. The voiced problems are explained by changes in the parameters of the biosphere under the influence of new high technologies. Digital technologies are a platform for the widespread implementation of total control and not only in the virtual space. Increasingly, the average man in the media hears about information wars. The formation of a different, new look of modern civilized development has become a trigger in the formation of a new interdisciplinary area of scientific knowledge and practical activity - securitology - the science of integrated security, including socio-economic, natural-ecological and climatic systems and considering human, society as object-applied elements, state and neosphere (Krivoshapko 2009).

The vast spectrum of accumulated knowledge from diverse areas of scientific knowledge demonstrates the transdisciplinary format of generating the platform basis for NBIC convergence. A certain orderliness of the layer of an ideological nature is formed along with the advantages of using convergent technologies, including ethical and philosophical points of problem-contradictory manifestation. The world political elite and the scientific community are faced with the issue of moral and humanistic
properties and social philosophy - about the impact of the Big Technological Four on the global society and the entire world civilization from the point of view of transformational restructuring, on changes in the distinctive format that will become part of the life and attitude of every person in the modern world. From the point of view of dialectical significance, the evolutionary formation of NBIC-convergence in the perception of the model of the modern world order in a technologically significant aspect— we can draw a parallel with technological platforms of evolutionary development of a promising orientation. This analogy indicates that the synergistic and emergent manifestation of interaction creates a configurable area of favorable conditions for a positive socio-economic background and comfortable factors of life. Thus, the built architecture of the manifestation-derived character predetermines the trajectory of the further development of the global society in the most significant aspects of the worldview and philosophical nature of the influence of convergent technologies (Chirkov and Chistyakov 2019; Abdrakhmanova et al. 2019; Dmitriev et al. 2020).

Technologies «BigData» can be positioned as one of the landmark products of converged technologies. «Big Data» is a tool for analyzing significant information arrays in various perspective variations of script development, which allows modeling the forecast course of various variations of events - political, economic and social - with high reliable accuracy. Let us note a distinctive feature of these technologies in the ability to process significant amounts of information, which would require spending large resources (including time) while using traditional tools for collecting and processing information. In addition, the involvement of information convergent technologies in the new reality allows us to analytically predict the different course of social processes, including political and socio-economic crises. The script flow of crisis phenomena in the plane of virtual visualization allows you to level or minimize their impact on the global society (Chirkov and Chistyakov 2019; Abdrakhmanova et al. 2019; Dmitriev et al. 2020). We can mention total gamification as negative manifestations of convergent information technologies, which is fraught with a threat of an applied nature in modeling political processes in order to correct them in the right direction for certain political segments, which can be built into the script of a change in political regimes (Podberezkin et al. 2019). The antagonistic manifestation of the voiced possibilities of convergence of information technologies is the use of calculated models of the negative course of various processes in order to refract the consequences of political, economic, social turbulence in the direction of maximum minimization of such consequences and possible positive script manifestation, taking into account all possible factors that have developed for a given chronological period (Chirkov and Chistyakov 2019; Abdrakhmanova et al. 2019; Dmitriev et al. 2020).

It’s impossible not to note the significant component of information technology in the fundamental principle of the source of power.

The main characteristic of the post-industrial era and society is the change in the ratio in the production of goods towards an increase in the provision of services. We can rightly note the increase in the volume of educational services, which directly affects the formation of thinking in digital consciousness. New intellectual technologies are a direct element of the post-industrial society, which are a driving factor in the evolution of a new format of intellectual activity. They also have a direct impact on the behavioral functions of an individual.
New opportunities open up in the synergy of digital technologies with traditional professions at the same time. This variation in technological configuration will lead to the emergence of new professions and it can also lead through great opportunities in the implementation of a creative approach in work, the so-called «Human in human». A significant part of labor relations is being transferred to the digital environment. Whole areas of employment are undergoing a global restructuring and are becoming more flexible. High technologies imply a revision of competencies and the emergence of new ones, leading to a chain reaction that entails a reformatting of the entire education system and a change in the usual appearance of the educational environment into a digital component of the knowledge economy of the post-industrial era, which is especially relevant in the post-coronavirus crisis. Transnational forms of education (cross-border education) are developing and leading to the complication of relations in a highly competitive environment of educational service providers. Trends in the export of education are growing, and the Russian Federation has also joined them (Abdrakhmanova et al. 2019).

There are the same technological shifts in the process of «data mining» now as in any human activity. Changes in recent decades indicate a transformational transition of scientific activity in the usual understanding of organizational and other processes, the effectiveness of the scientific approach and its implementation in the system of public interests and needs - into a different format-specific configuration in correlation with the processes of social transformation associated with the era of transition of civilized development to NIO. 2 (Bodrunov 2018). A certain indicative indicator of the significant role of the DE in the civilization of the post-industrial era is the increase in its component in the GDP of economically developed countries. Practical experience in the formation and implementation of relevant state/corporate programs indicates the importance of this approach in the information component of the national economies of the leading countries of the world (Table 1).

| Japan          | Smart Japan ICT strategy | 2014 |
|---------------|--------------------------|------|
| PRC           | Internet plus China’s official strategy for the ubersation of the economy | 2015 |
| South Korea   | The 3rd science & technology basic plan | 2013 |
| The USA       | Advanced manufacturing partnership IndustrialInternet Consortium (AT&T, Cisco, General Electric, IBM, and Intel) | 2014 |
| France        | Alliance pour L’Industrie du Futur / Nouvelle France Industrielle | 2016 |
| Germany       | PlattformIndustrie 4.0 | 2014 |

Source: (Alekseenko and Ilyin 2018)

The completeness of information and accessibility to information resources is becoming a new trend in modern civilization, in which information is indispensable in
the post-industrial economy. The digital age is characterized by the transformation of information into knowledge and a leading factor in new technological production. Information is characterized by its unlimited transparent transfer during communicative interaction, which contributes to the creation of intellectual activity of a post-industrial format.

Artificial intelligence (AI) is one of the key elements of the transition to the sixth technological order (the fourth industrial revolution) and digital industrialization. The industrial Internet (industrial Internet of things) is a catalyst for the intellectualization of the techno sphere. The Industrial Internet of Things allows you to create a unified information communication configuration for various residents of the production process, including remote at various distances and located in different states. This integrated set of industrial production entities, which is managed from a single center (intellectual core), is the essence of a network (digital) corporation, characterized by flexibility and mobility of synchronous restructuring of production cycles. This feature is a platform for the distinctive advantage of a digital corporation from classical TNCs and other forms of business activity in the format of technological dynamism that provides unprecedented competitive advantages. Stable trends in the development of information technology have generated a range of technological content of possible scripts for the evolution of post-industrial society and also in variations of the practical application of deep digital potential. The formation of the modernization reformatting into a digital format of the post-industrial society is taking place.

4 Conclusion

The information society, the formation of which we are witnessing, along with convergent technologies is characterized by the generation of new sciences and the integration of variations in knowledge into the everyday routine.

The information technologies are the basis for the formation and subsequent evolutionary development of post-industrial consciousness and the digital economy (infonomics) in new manifestations of a civilized mentality and a network structure. Artificial intelligence is a technological brand of post-industrial civilization. The universal ability of AI to solve multifaceted tasks from the standpoint of digital consciousness and self-development will make it possible to move to a qualitatively new technological level of post-industrial society.

The motives and nature of labor are changing under the influence of convergent technologies in a post-industrial society. Labor in the process of creation in such a society is represented by a large filling of interpersonal interaction, which is a characteristic distinguishing feature of pre-industrial and industrial social development and it’s more associated with nature, the impact of man on the environment. The sign of a human constituent in machine production is leveled. It’s a person who becomes the epicenter of a new eventful world filled with a different toolkit for contact with matter in all its manifestations.
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