

Research of the factors and conditions for development of the digital economy in Russia

S.M. Ilchenko¹

Non-State Educational Institution of Higher Professional Education «Omsk Humanitarian Academy»,
Omsk, Russia

Abstract. The basis of the study is the compilation and analysis of works by domestic and foreign economists, study of the information from official websites of government bodies, methods of analysis, comparison and generalization, and mathematical modeling. Results and conclusions: in order to develop the effective approaches and directions for the research program for development and transformation of the digital economy in Russia, in addition to global processes and digitalization trends at the regional level, along with politics, economic environment, macro-processes, it is important to take into account the sum of factors of the ecosystem of the digital economy as a new economic order: economic, demographic, scientific and technical, geo-potential, state and legal factor. The scientific novelty of the study is reflected in the proposed understanding of the term “digital ecosystem” for solving the above set problem using interdisciplinary approach.

1 Introduction

Growth of the digital economy in Russian Federation is implemented on the basis of the formation of a state approach and completion of national programs, including the development and implementation of end-to-end technologies, analysis technologies, forecasting and introduction of new management methods, and, thus, completion of tasks of strategic importance, primarily in the context of internal socio-economic well-being of the state and fulfillment of the key condition for its development – strengthening of national sovereignty under the conditions of globalization and the implementation of programs for digital competition with other players in the global market. In this regard, the *digital transformation process* deeply affected key public and industry institutions, when the entire civil society perceives and uses the services of the “digital world” realizing the concept of “open society” in various ways (according to [21]), see Fig. 1.

¹ Corresponding author: ilchenkosm@yandex.ru

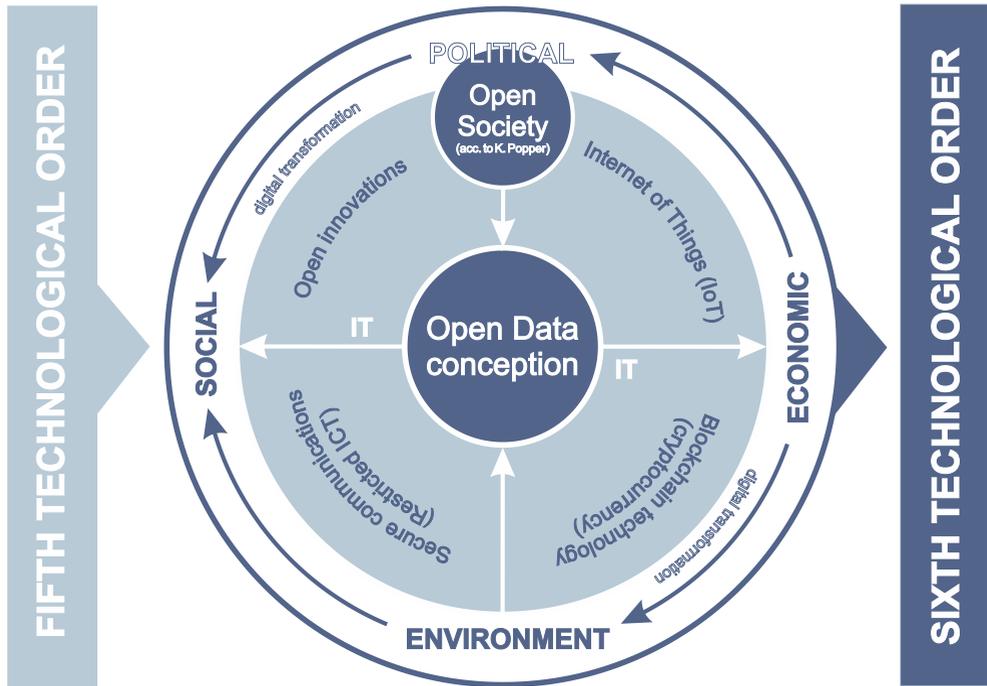


Fig. 1. The Open Society conception in the context of digital transformation towards the Digital Economy.

Without a doubt, the formation of the digital economy [24] is accompanied by powerful technological, legal and resource support, the basis of which, primarily, is the Constitution of Russian Federation, Federal Law dated June 28, 2014 No. 172-FZ “On Strategic Planning in Russian Federation”, “Strategy for the Development of the Information Society in Russian Federation for 2017-2030” [23], as well as the provisions of legislative acts and other regulatory documents of public bodies regulating the sphere of information and communication technologies and national security in relation to formation of a new scientific technological basis for the national economy.

2 Materials and methods

According to S.Iu. Glazev. [6, 7, 8] a “technological order” suggests understanding the sum of technologies specific for a certain level of production development. Due to *scientific and technical and technological progress* (STP), the transition from lower orders to more progressive ones occurs [6]. Each order covers a closed reproduction cycle – from the extraction of material resources and professional training of personnel to non-production consumption. Accordingly, within each technological order, a closed macro-production cycle is present, including procurement of primary resources, all stages of their processing and production of a range of final products that satisfy the corresponding *type of public consumption*. This thesis is supported by K. Perez [18], who asserts that a new technical economic paradigm develops as a result of the transfer of new technologies, which, in turn, leads to the multiplier effect on the economy, additionally changing socio-institutional structures. Thus, it is possible to define the emerging technical and economic paradigm as a set of the most successful and profitable practices, existing under conditions of the need to choose the principles, methods and technologies within the framework of organizational structures, business models and strategies. These mutually compatible principles and

criteria develop as a result of the processes of overcoming obstacles and finding the most adequate procedures, proven practices and structures [19], processes of using new technologies – the purposeful transformation processes. Thus, the concept of “digital economy” as a new form of economic activity organization of society and socio-economic relations within it, is, in practice, an unconditional reflection of the changes that are taking place in the world as a whole, and within the framework of individual national economies, in the process of transition from one state to another, i.e. from the 5th technological order to the 6th one (see Fig. 1). At the same time, those are the most adaptive expressions of this form that will become the basis for maintaining and increasing the rates of socio-economic development of nations. Authors such as O.V. Godina, Iu.Iu. Kosenkova, L.S. Maksimenko, Iu.R. Mezentseva, T.A. Shcherbakova [9], while analyzing the defining trends in the innovative development of the Russian economy, explained by the change in technological orders, signify the importance of the humanitarian component of the set of intangible assets of economic growth – the formation and development of human potential.

According to S.L. Sazanova, N.V. Kuznetsov. [22], the digital economy is a new type of economic system that has features and levels of the evolutionary economy: micro-, meso- and macro- levels with adaptive projection of these features onto the main institutional characteristics.

In our opinion, the systemic “digital economy” is formed by organization of the economic activity of society and socio-economic relations within it, developing as a result of STP, and, with the best practices aimed at creating more value, thanks to the use of both technologies of the 6th technological order and reactive social processes [1], directly affecting the possibility of long-term and sustainable development. In this case, it becomes evident that the use of the same solutions, both for national economies and for microeconomics with different levels of political, economic or business development, is not always an efficient approach, since the assessment of the resource support of the public marginality of such solutions (business projects) should take into consideration the existing features, resources and real forecasts on the actualization of new technologies.

Theoretical model for assessing the national economic potential [20] and the functional successfulness of the state (1) in the main spheres of activity, reviewed in a number of contemporary publications, reflects the factorial approach that allows building a technical model of a stable economic state (1) [4]:

$$G(t) = 0,5 \left(1 + X_M^{0,43} \right) \cdot X_T^{0,11} \cdot X_D^{0,19} \cdot X_E^{0,27} \quad , \text{ where:} \tag{1}$$

$X_i \cdot (i = T, D, E, M)$ – shares of the state in global indicators, in the territorial, demographic, economic and innovation technical spheres respectively.

In this regard, the work [5] by G.N. Vinokurov, V.I. Kovalev, G.G. Malinetskii, S.Iu. Malkov, Iu.A. Podkorytov is theoretically close; they project the assessment of the economic status as a function u_i of the socio-economic stability and socio-economic arrangement (2):

$$u_i = \left(1 + \frac{I_i}{100} \right)^x \left(\frac{z_i}{z_{max}} \right)^\omega \left(\frac{s_i}{s_{max}} \right)^{1-\omega} \left(\frac{\zeta_i}{z_i} \right)^{\delta_i \mu_i} \quad , \text{ where:} \tag{2}$$

parameter $\omega = 0.65-0.75$ of the importance of the *market capacity factor in relation to the processing industry* [10; 14] (coefficient of elasticity by the amount of the population involved in the creation and consumption of GNP), leaning on estimates of the corresponding parameter of the Cobb – Douglas production function (3) [10] and function of the *state geopotential* (model by G.N. Vinokurov et al. [5]);

statistical parameter $x = 2-2.55$, reflecting the contribution of the technological factor to

the independent development and realization of national interests in all spheres of economic and social activity, for guaranteed provision of the sovereignty index of the national economy and the state as a whole (evaluated using the concepts of *economically active individuals* and *economically efficient space* for the implementation of economic activities);

parameter $\mu_{ij} \geq$ of proximity of the j -th business groups to the i -th state structures (the state itself, state-owned companies and corporations), implementing priority national goals and objectives of state economic policy (as specified in the “Strategy for Development of the Information Society in Russian Federation for 2017-2030” [22], assessed based on *digital transformation indicators* (DTI) of industry markets (y_3, z_3 – in (4));

parameter $\delta_i > 0$ of complementarity, reflecting the *additionality and compatibility* of the transactional development of the ecosystem of the digital economy.

$$Y = AL^\omega \cdot F^{1-\omega} \quad , \text{ where:} \quad (3)$$

A – STP factor providing the development of new production factors (total productivity), L – human resources involved in the production process, F – financial resources, ω – labor elasticity coefficient.

3 Results and Discussion

Evaluation of the genesis of transformation in social and economic development of the digital economy is inevitably influenced by new factors, caused by evolution of existing ones and the emergence of new ones, reflecting both favorable and dangerous trends and risks of a new stage of development. It is this paradigm, the importance of updating which in the digital economy, is the definition, the derivatives of which are part of the spheres of forecasting and long-term evaluation of any projects. Such *processes* management should be viewed from the perspective of digital economy and is directly related to *information and technological infrastructure* in such areas designated by the state as: economics, science, transport, communication, power generation, healthcare, banking, fuel and energy complex, nuclear energy, defense and aerospace industries, mining, metallurgical and chemical industries.

At the same time, definition of areas of activity sensitive to the development of digital economy, presented in the Federal Laws and other legislative and regulatory documents, in our opinion, covers only a part of the most vulnerable spheres of the “industrial” functioning of society and the state, since they do not cover new systemic technological and formational changes specific for “*postindustrial*” stage of development. It is the “*postindustrial*” stage (at the very essence of the digital economy) that is characterized by the correlation of relations and connections and the formation of the ecosystem of economic activity, both its “industrial” and “public and social” components and the formation of a complex convergent system of the modern social order.

4 Conclusion

Thus, as both theoretical conclusions and practices of the current state of the world economy demonstrate, which economy periodically experiences crisis shocks, unevenness and imbalances in its various spheres, such interaction is realized and develops under the conditions of many factors and feedbacks that form the contours of *human-machine* and *social-and-mental* relations, having both indirect effects and externalities, depending on complex combined processes of socio-economic development, high speed and scale of global geopolitical, technological and economic processes, as factors of deformation of ideas about social order in the ecosystem of the new economic order.

Specifics of the current stage of economic development are defined by the fact that under the conditions of large-scale formation of the 4th economic order of the world economic space, the technical basis of these spheres is the information infrastructure, and the information basis are the information systems and data (BigData), which are formed, generated, stored and used by business entities on the basis of the principles of global digital transformation and the introduction of end-to-end IT at all levels of economic activity. Transboundary human participation (as a manager, operator, and user, and a creative subject) in this ecosystem is the component, which actively influences the successfulness of every existing and newly created object of the digital economy. The systemic elements of the ecosystem are directly related to the social goal setting of public order and include, in addition to the economic system being a system of distribution of resources, benefits and income of community members, the cultural and ideological (an example of this is the ideology of the “consumer society” or the philosophy of the “information society”.) subsystem of society and individuals as objects of the digital economy with the corresponding symbolic subsystem, associated to a certain extent with political symbols. With the new economic order, new symbolic forms are formed simultaneously, which are set in the national society, both as an ideology and as a factor of emotional, motivational and information impact and interaction of subjects of modern society.

An imbalance in the ecosystem of the digital economy, in the process of the transition from the 5th technological order to the 6th we are reviewing, is related to lack of the required level of complementarity in business groups and has indicative characteristics that are due, inter alia, to the drain of professional staff, the withdrawal of capital abroad, negative factors of import dependence in sectors of the economy having priority for digital transformation. In the new economic order, apart from global processes and the trend of digitalization in the economy at various levels (micro, meso, macro), along with politics, economic environment, ecosystem factors are activated: economical, including the level and structure of incomes, inflation rates, unemployment, etc.; demographic (*economically active individuals*); scientific and technical (STP in the aspect of digital transformation), geopolitical factor, including one in relation to natural resources; state and legal, in terms of the favorableness and sufficiency of the legal and regulatory framework.

Against this background, a dynamic ecosystem of the digital economy and economic interaction forms, built on the basis of information and digital and traditional ties that form the processes of either cooperation, or competition and confrontation (society, individuals, labor collective, employers). Accordingly, the *synergetic aspect* (see [15]) of the economic environment is updated, which, in turn, forms the *activity aspects*, concepts and processes of sustainable and holistic development and existence of the ecosystem of the digital economy, forms the economic activity regulated by society and the state (for details see [6, 11, 12]). It is evident that at this stage, it is the digital economy that creates a new ecosystem where these aspects are manifested. The task of forming a modern, successfully functioning digital economy subject is to determine the principles of management and to justify the choice of such management methods that will be maximally harmonized with the implementation conditions both in the short and in the long term.

Therefore, in modern approaches to the management practices in complex (integrated) market systems [11, 12, 16] (to which the ecosystem of the digital economy belongs as a whole at the metasystem level), digital technologies are connected, on one hand, with personality priorities (goals, ideals, values, meaning of life) and general cultural and ideological components, on the other hand, the tasks of creating business process management systems are updated, in which all possible transactions would occur in automatic modes, creating modern technological platforms operating with “digital doubles” (models, see [3, 13]) of business systems based on the principles of *real-time management*,

allowing for proactive policy for managing business processes at any level and on any management object. Systemic issues affecting the conditions for the manifestation of factors of sustainable and continuous economic development [12] in the ecosystem of the digital economy in this case are the area of responsibility of the manager of a business unit and, de facto, require the formation of their own roadmap, providing the management concept and other business processes.

In this regard, the differentiation of space of the economic segment itself is possible, in particular, the allocation of sectors of the real economic block, and differentiation of business virtual information spaces (with three main functions: communication, interaction, socialization). Without a doubt, digital transformation of economic reality does not imply extinction of the classic economic relations, but its obvious consequence is the concentration of main efforts in the information and communication sphere of the cross-border information environment and the information services market as such. Under such conditions, the globalization of interactions between the human personality and the information space is both an indirect factor of technological growth and a factor of risk activation for the objects involved [17].

Thus, one of the signs of the digital economy is creation of added value through the generation of digital economic benefits with the increasing role of non-digital factors for ensuring economic growth associated with scientific and technological changes in the field of end-to-end technologies, and the will of states to use their *advantages in the level of economic development, high technologies* (including IT) as tools in global competition. There are appearing conditions when the same subject plays several roles in everyday life. It is important that in a digital society the citizens received new knowledge and rights related to protection of their personal digital sovereignty over intellectual property, personal data, assets in physical and digital form, etc., and the economy of the state and society as a whole, received opportunities to strengthen their national and public interests, while the business community, in its turn, experienced less shocks that would offset its efforts in terms of economic growth stability.

References

1. K.R. Avetisian, Bulletin of the East Siberian Institute of the Ministry of Internal Affairs of Russia, **1(76)** (2016)
2. I.A. Arenkov, S.A. Smirnov, Russian Journal of Entrepreneurship, **19(5)**, 1711 (2018)
3. Iu.S. Vasilev, G.N. Nuryshev, Geopolitics and Security, 1(25), 104 (2014)
4. G.N. Vinokurov, V.I. Kovalev, G.G. Malinetskii, S.Iu. Malkov, Iu.A. Podkorytov, Projects and risks of the future. Concepts, models, tools, forecasts (KRASAND, 2011)
5. S.Iu. Glazev, International Economics, **5**, 5 (2010)
6. S.Iu. Glazev, Scientific report, 6 (2007)
7. S.Iu. Glazev, The theory of long-term technical and economic development (1993)
8. O.V. Godina, Y.Y. Kosenkova, L.S. Maksimenko, Y.R. Mezentseva, T.A. Shcherbakova, ISC 2017 Advances in Intelligent Systems and Computing, 726 (2019)
9. P.Kh. Duglas, Milestones of Economic Thought. Production Factor Markets, 3, 26 (School of Economics, 1999)
10. S.M. Ilchenko, F.V. Katerov, Economics and modern management: theory and practice, 26 (2013)
11. S.M. Ilchenko, Ia.V. Krukovskii, Strategic planning and enterprise development. Materials of the XV All-Russian Symposium, 210 (TSEMI RAN, 2014)

12. V.B. Kondratev, *World Economy and International Relations*, **7**, 5 (2015)
13. Ia.V. Krukovskii, *Region of Russia*, 1, 36 (2002)
14. B. Latur, *Sociological education*, **6(2)**, 79 (2007)
15. K. Perez, *World development*, 13(3), 441 (1985)
16. K. Perez, *Cambridge journal of economics*, 34(1), 185 (2010)
17. A.A. Akaev, S.Iu. Malkov, *Geopolitics and security*, **4** (2009)
18. K. Popper, Tr. from English ed. by V.N. Sadovskii (1992)
19. S.L. Sazanova, N.V. Kuznetsov, *Lecture Notes in Networks and Systems*, vol 129. Springer, Cham (2020)
20. Decree of the President of Russian Federation dated May 9, **203** (2017)
21. State Corporation “Rostekh”, <http://ar2016.rostec.ru/>
22. Strategy for development of the information society in Russian Federation dated February 7, 2008 No. Pr-212, <https://rg.ru/>