Features of strategizing the modernization of the technical structure of production as a form of innovative development

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Abstract. The prerequisites for assessing the significance of studying the processes of strategizing the modernization of the technical structure of production, the results of which are presented in the article, are predetermined by the increase in their role in the activation of innovative processes. The research purpose is to identify the features of strategizing the modernization of the technical structure of modern production as a form of its innovative development, the interpretation of factors and conditions. The methods of analysis, algorithmization, interpretation of factual information, generalizations and other methods were used. The novelty of the study of the issue of strategizing the modernization of the technical structure of production as a form of its innovative development is expressed in identifying the dynamics and direction of changes in the technical mode of production, assessing the development factors of this process, which seems to be very important in interpreting the changing patterns of transitions taking place, the presentation of imperatives of their understanding, the definition of evolutionary dynamics and the boundaries of the life cycle of each technological mode. The scientific results indicating an increase in scientific knowledge in the text of the article include as follows: a presentation of the trends in the modernization of the technical structure of production as a form of its innovative development, interpretation of the motivation and forms of ongoing actions for effective modernization on the examples of US reindustrialization and neo-industrialization of Russia.

Keywords: Modernization · Technological mode · Technical structure of production · Innovations · Reshoring · Digitalization.

1. Introduction

A review of the theoretical research base shows that, based on the ideas about the existence of innovative transformations of the technical structure of production of modern economies, they differ in different depths of its transformational changes.

Using the existing typology (Freemen, 1987), it is legitimate to systematize them precisely on this basis. Moreover, it is advisable to single out systemic, radical, incremental and paradigm changes, paying attention to the need to use a differentiated approach to strategizing the development of these forms of innovative processes. It seems that the strategizing of development of paradigm forms of innovative transformations is connected with a change in the scientific-ideological world outlook platform and a new way of thinking of their subjects.

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Innovative systemic changes are associated with a change in technological modes (Glazyev, 2021) in the development of a technical method of production. As a result, according to Glazyev S.Yu., the dialectics of this process requires, when assessing transition patterns within the framework of strategizing, taking into account a number of factors: assessing the potential of evolutionary dynamics, taking into account the boundaries of the life cycle of each technological mode, recognizing the fact of coexistence of the emerging, dominant and descending modes, experiencing different phases of their evolution, as noted by (Uskov, 2020). In this regard, Ilyina I.E. and Klypin A.V. conclude that the current time period (until 2025) is a transitional one for Russia. Within its framework, the results of the first stage of implementation of the Strategy for Scientific and Technological Development (SSTD) of Russia (Decree of the President of the Russian Federation …, 2021) are evaluated; the ways of solving new tasks facing society and the state are verified and determined. In the long term, the spheres of science, technology and innovation should function only as a single complex structure, since such unity makes it possible to ensure the technological self-sufficiency and competitiveness of Russia (Ilyina and Klypin, 2020).

Revolutionary innovative changes are mutational transformations characterized by the emergence, under the influence of external conditions and due to the adaptive capabilities of the system, of its new properties and qualities. Besides, they are stored in its hereditary-genetic apparatus. The strategizing of the process of development of drastic innovations should be based on the principles of the evolutionary-genetic approach. An example of such changes is the widespread digitalization of the economy, which is characterized by fundamental transformations in the collection, transmission and use of information (Varnavsky, 2019). In modern conditions, digitalization is the introduction of modern digital technologies in various areas of life and production: online services; Internet trading; electronic payments; crowdfunding; Internet advertising; electronic document management, etc.

Incremental innovations refer to modernization transformations, the essence of which is clear from the interpretation of the concept of "modernization" as an update (renovation) of elements of the existing technical structure of production in the format of the dominant technological mode. Therefore, their strategizing should be approached as the development, for example, of foresight projects for developing rationalization-type innovations.

Paradigm innovations are a kind of innovations built on the basis of a set of scientific data or axioms that are beyond question and represent a certain pattern of innovations (Ryabokon, 2009). An example from physics of the beginning of the twentieth century is the transition from the Maxwellian electromagnetic worldview to the Einsteinian relativistic worldview, which did not happen instantly or quietly, but along with a series of heated discussions with empirical evidence and rhetorical and philosophical arguments from both sides.

These are the author's ideas about the strategizing of development of paradigmatic forms of innovative transformations, which are associated with a new way of thinking of their subjects.

The innovative staging nature of the article is predetermined by the definition of strategic prospects for the development of innovations of various types. This is extremely important not only from the point of view of ensuring a methodologically clear differentiation of relevant concepts and the conceptual harmony of the economic theory describing these types of innovations, but also from a purely practical point of view, when it is necessary to determine the policy at each stage of economic development. For example, the implementation of the Economic Development Strategy of the Commonwealth of Independent States over the past thirty years for the period up to 2030 has made it possible to maintain and develop a common economic, cultural-humanitarian and information space. To a large extent, this contributed to the formation and strengthening of sovereign states included in the CIS (Economic Development Strategies …, 2020).

This approach predetermines, in particular, the identification of the current position of the economy of each country on the evolutionary trajectory of its development, including the determination of its position relative to the life cycle phases of the corresponding technological mode. Such procedure is extremely important for a clear orientation in the space-time continuum when determining the ratio of the resource-technological potential of the emerging, dominant and descending modes. This approach

predetermined the objectives of the study, the results of which are presented in the article. It made it possible to update the setting of strategic tasks for the techno-economic development of the national economy of countries at different levels of their development. This allows avoiding both unreasonable running ahead and lagging behind the historical course of events. First of all, this position concerns the assessment of the actual situation and the challenges and trends in the development of the technical and technological structure of public production dictated by life. Miscalculations made in the strategizing of techno-economic development can be fraught with serious economic and social losses for social progress.

The statements predetermined the research purpose and objectives, which consist in identifying the features of strategizing the modernization of the technical structure of modern production in a number of countries as forms of its innovative development, as well as in presenting the factors and conditions that are desirable for positive conditions for country development.

2. Materials and Method

Methods for developing the problem posed: postulates of the dialectic of the relationship between the technical and social structure of production, methods of institutional approach, methods for taking into account previous historical trends, comparative analysis.

3. Results

In applied terms, the problem statement concerns the search for an answer to the question of identifying the signs of the technological mode dominating at this moment in history. Only a reasonable answer to this question will make it possible to clearly define the starting position and develop an effective algorithm for strategic development, fully using the resource and technological potential of the structures that function in modern conditions.

Such problem statement is due to the ongoing discussion about the qualitative certainty of the current stage of social development: In what kind of society, in terms of its technical and technological mode, do we live: in industrial or post-industrial one? (Inozemtsev, 2000)

The United States of America, striving, as always, to be “ahead of the whole world”, declared itself a society of post-industrial development, arguing that the share of the service sector in the structure of their economy exceeded the share of the material production sector. The USA leads the world both in terms of the volume of services rendered and in terms of the share of services in the country’s GDP. The service sector has become the most important driver of US economic leadership in terms of value added, employment and trade. In 2018, service-producing industries provided 69.9% of US GDP, or $14.3 trillion, and also accounted for 80.3% of total employment in the private sector (Popova, 2019). Moreover, the tertiary sector of the economy, as defined by the U.S. Census Bureau, produces all kinds of intangible values and includes 13 areas, including: wholesale and retail trade, information, business, technical and scientific services, healthcare, entertainment, recreation and real estate services.

However, this situation was not caused by objective laws of social development, but was artificially created by transferring a significant part of non-environmentally friendly, resource-intensive and labor-intensive industries to foreign countries for external outsourcing by American corporations. Such industries do not generally require highly skilled workers, who do not claim to have super income. The turn in the development of the US economy was carried out in the interests of saving the cost of raw materials and labor, focused on improving the state of the living environment of the US population, improving the environmental situation in industrially oriented states. This artificial maneuver gave rise to American strategists’ statements about a breakthrough in the technical-economic development (Kondratiev, 2019).

However, life realities quickly put everything in its place, and the adventure started by American strategists failed. At the end of the twentieth century, it became clear how dependent the US economy was on the import of finished goods and components from foreign countries. Then American strategists began to pursue a deoffshorization policy, i.e. to repatriate part of the production facilities previously allocated for external outsourcing to the country’s economic space.

Besides, reshoring is carried out very aggressively: the USA acts very aggressively, but is accused of offshore behavior for criticizing the Brussels antitrust investigations (Gorkina, 2020). Such self-deception can be illustrated by analogy to the failed attempt to create an artificial offside position in football, when the uncoordinated actions of the defensive players lead to the ball in their own net.

The dynamics of civilizational technological processes in the USA has become involutionary, while the modernization of the technical structure of production has the specifics of reshoring, focusing on the form of a shuttle maneuver "outsourcing – reshoring". Thus, a mistake in determining the real coordinates on the trajectory of evolutionary development of the national economy as a result of American strategists' speculative actions and self-deception came at a cost for the US economy, giving rise to the time loop effect, loss of time due to returning to the starting point of movement.

Apparently, the desire to bring the future closer, inherent in "great strategists", played its role. It is no coincidence that folk wisdom says: "A bird in the hand is better is worth two in the bush". Certainly, today's American leaders want to live in a post-industrial society. It is proper to ask the question: "Is the strategic resource of the technical and technological development of the industrial method of production exhausted, i.e. the mass production of machines by machines?" The answer to this question is extremely important for determining the Russian version of modernization of the technical structure of production. To search for it, one should undoubtedly note the difference in the starting positions of the process of modernization of the US and Russian economies (Shocking Consequences of US Deindustrialization, 2014).

The USA began re-industrialization in the form of re-offshorization after its unsuccessful maneuver with the venture of external outsourcing of a number of industrial productions, when the fact that the country's inflexible dependence on imports of many goods was found to threaten national economic sovereignty. In Russia, the process of modernization of the technical structure of production in the form of neo-industrialization began after the destructive effect of the market "reform" conceived by the Jesuits and implemented on Chubais-Gaidar example, which led to the de-industrialization of Russian economy due to its involutionary nature (Ovchinnikov, 2018).

4. Discussion

A significant contribution to the development of fundamental theoretical foundations and applied research of this extremely important issue was made by Russian scientists (Glazyev, 2021; Ilyina and Klypin, 2020; Kuzyk and Yakovets,2005), and in terms of strategizing, a team of researchers from the Institute of Economic Forecasting under the leadership of (Ivanter, 2005). The problems of choosing the Russian way of modernizing the technical structure of production are reflected in scientific publications (Ovchinnikov, 2018; Glazyev, 2021).

Indeed, being thrown back in its evolution to the previous era of the historical path that had already passed, Russia experienced an acute need for re-industrialization – neo-industrialization, i.e. in restoring the industrial nature of the technical structure of public production.

Besides, planning the transition to the post-industrial stage of social development in a strategic perspective, Russia followed the path of implementing a strategy for the full use of the resource-technological potential of the industrial method of production. In the format of this dominant technological mode, this strategy is implemented in the form of a generation change of technical production means in basic industries with a gradual increase in the potential of mastered technologies of the post-industrial method of public production.

5. Conclusion

Thus, both the initial positions of the study conducted and the directly conceptual models of public production modernization in the USA and Russia have a different economic nature, different motivations and different results, which led to fundamental differences in their qualitative certainty: reindustrialization and neoindustrialization.

Russia preserved in its technical structure the basic principles and qualitative characteristics of the industrial method of production, due to the strategy of changing the generations of technical means in

a number of key technical progress areas, such as innovative technologies of the defense industry, consistent advancement in space exploration, aircraft manufacturing, goal-oriented development of the Arctic territories, production and transit of energy carriers. A complex of unique marketing (Ketova, 2020) and other technologies has also been formed. This creates the basis for a very stable position of the Russian economy.

Positive results of the development of the Russian economy and discoveries of 2021 are the created Russian medicinal product "Sputnik" against Covid-19, delivered to more than 30 countries of the world, a neutrino detector, which ensures the prevention of accidents at nuclear power plants, indicators of the possibility of settling the East Siberian Arctic and other regions (Science Magazine listed the most important scientific discoveries of 2021, 2021). They, along with other achievements, provide the basis for the author's verified theoretical conclusions, methodological principles and approaches to strategizing scenarios for the development of the technical structure of production, and make it possible to clearly determine the trajectory of the consistent evolutionary dynamics of social progress.

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