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The Scientific and Practical Significance of The Paradigm of The Development of Scientific Support of the 10th Technological Order in The World Economy

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ABSTRACTS

The subject of the article is the scientific and practical significance of the paradigm of the development of scientific support of the 10th technological order in the world economy; the object of the article is the effectiveness of the development processes of the tenth technological order in the economy and society; the purpose of the work is to increase the efficiency of the development processes of the tenth technological order; to achieve this goal, the following tasks are solved: socio-economic roles and results are described the transition of organizations to the conditions of the tenth technological order; a systematic analysis of technological orders is carried out; the image of the future tenth technological order is formed; the expediency of applying the theory of technological order in systemic unity with crisis management is justified (it is shown that this will reduce the risks of crises); indicators are given to assess the effectiveness of the processes of the organization's entry into the tenth technological order; the scientific methods of this article are: historical analysis, system analysis, comparative and logical analysis; heuristic synthesis, political science, system-analytical approach, system engineering, expert methods, efficiency theory; Scientific novelty of the work is determined by the description of the scientific and practical significance of the theory of technological regimes to reduce risks and damage from the crisis, which is associated with the formation of the tenth technological regime.

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1. INTRODUCTION

The relevance of this work is determined by the need to improve the efficiency of the processes of entry of organizations into the tenth technological order (TTO) in the world economy. The article deals with commercial organizations (corporations), firms, entrepreneurs) and non-profit organizations (states, local governments, and public organizations). The task of entering the TTO is also faced by other types of organizations: regions, corporations, technology platforms, clusters, and firms. The process of entry of all types of organizations (the state, corporations, and others) is influenced by the global systemic crisis. This crisis is closely connected with the process of forming a new technological order.

The entry of all types of organizations into the TTO can be called the most important problem for the world economy and society for the period up to 2040. The subjects of the process of transition to the TTO are: global governance bodies (the World Trade Organization, the World Monetary Fund, OPEC, the World Bank, etc.), national governments, political parties, managers of corporations and firms, etc. The purpose of the work is to increase the efficiency of the development processes of the tenth technological order. To achieve this goal, the following tasks are solved:

(i) Socio-economic roles and results have described the transition of organizations to the conditions of the tenth technological order;
(ii) A systematic analysis of technological orders is carried out; the image of the future tenth technological order is formed;
(iii) The expediency of applying the theory of technological order in systemic unity with crisis management is justified (it is shown that this will reduce the risks of crises);
(iv) Indicators are given to assess the effectiveness of the processes of the organization's entry into the tenth technological order.

2. METHODS

The object of the article is the effectiveness of the development processes of the tenth technological order in the economy and society. The subject of the article is the scientific and practical significance of the paradigm of the development of scientific support of the 10th technological order in the world economy.

3. RESULTS AND DISCUSSION

The analysis of scientific papers on the topic of this study shows the following. In the conditions of transition to a new technological order, modernization of enterprises is necessary (Sviridova, 2018; Kozina, 2016).

Modernization is also necessary for national economies and the social sphere of states. In the process of modernization, an important role belongs to the industrial policy of the country.

The development of clusters has led to the emergence of cluster policy as a new segment of economic policy (Vertakova, 2015). The regional innovation policy of the country plays an important role in the modernization of regions. A distinctive feature of the policy is the coordination of the interests of the participants in the modernization process (Feldman, 2016). At the same time, innovation policy and strategies of economic entities (corporations, firms) play an important role. An important role in increasing the effectiveness of

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modernization policy belongs to the methodology of system and management approaches in such a policy. It is known that researchers describe the process of capitalist development in the form of six successive technological orders (Glazyev, 2016). The world order determines the external geopolitical conditions of the transition of the world economy to a new technological order (Vilovatykh, 2020). The choice of an enterprise strategy plays an important role. Scientists propose methods for creating programs for the transition of enterprises of various industries to work in the conditions of the new 9th technological order (Glushchenko, 2021b). To substantiate the content of measures for the transition of enterprises to a new technological order, it is necessary to develop a scientific theory of technological orders (ways) (Glushchenko, 2021c).

System analysis can be the basis for the development of modernization programs for enterprises and the global economy as a whole (Glushchenko, 2021a). Such an analysis shows that the technological order is a large multi-level system. The theory of multilevel (hierarchical) systems was proposed for the study and design of large systems. Scientists express the opinion that the level of technological development affects the geopolitical position of the state. Risks can significantly affect the process of formation of a new technological order, and affect the economic efficiency of innovative projects in the country (Glushchenko & Glushchenko, 2020). In the process of developing a new technological order, it is necessary to modernize scientific and innovative activities on a scientific basis.

In the process of developing a new technological order, it is necessary to manage the formation of a system of new institutions (a system of new professional relations) (Gluchshenko, 2021d).

The development of new technologies will affect the risks of the activities of geopolitical and socio-economic entities (Glushchenko, 2020a). The development of the technological basis of organizations affects, among other things, the global and national currency systems (Gluschchenko, 2022). The degree of innovative development of the economy affects the stability of the national currency and currency risks (Glushchenko & Glushchenko, 2016).

The formation of the 9th technological order will affect the forms of educational activity and the development of project higher education (Gluchshenko, 2021e). The development of a new technological order can generate acute conflicts in the scientific environment. Scientific and technological progress leads to the expansion of human rights (Gluschchenko, 2018).

The process of forming a new technological order is usually accompanied by a crisis. This crisis removes obstacles to the creation and implementation of new technologies (Gluschchenko, 2008).

Active synthesis of nanotechnologies is considered the most characteristic feature, characteristic of the new 9th technological order. Scientists predict the emergence of new technological platforms, in particular, in the field of creating neurotechnologies (Gluschchenko, 2020b). For the successful formation of a new technological order in the national economy, it is necessary to create a mechanism for managing the development of the 9th technological order (Gluschchenko, 2020c).

In the process of developing elements of a new technological order, paradoxical management decisions may be made, in particular, in the field of reforming the world monetary system.

Corruption can slow down the processes of creating new technologies, and the formation of a new technological order (Gluschchenko, 2012). Scientific support for the formation of a new technological order may include the creation of new scientific theories (Gluschchenko,

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2008). In the process of forming the 9th technological order, it is necessary to pay great attention to anti-crisis management.

Marketing remains an important development tool. In 2022, the formation of the methodology of anti-crisis management of all sectors of the economy continues (Glushchenko, 2018a).

In anti-crisis management at the state level, the state model can be applied. Within the framework of such a model, the state can be considered a non-profit public corporation.

In the process of transformation of organizations in the conditions of the 10th technological order, it may be necessary to rebrand these organizations (Glushchenko, 2020d). Published scientific papers show that at the beginning of the 21st century there is a transition to a network economy, a network society is developing, and network relations (Ravochkin, 2021). At the same time, there is a change in the degree of influence of various institutions in the economy and society (Ravochkin, 2021). Changes in social relations, including in the world economic order, are also likely to take place. These changes may affect the interests of various social groups, which may be the cause of the crisis (Glushchenko, 2022b). The analysis of publications on the topic of this article, conducted in this article, showed the following:

(i) The prospects for the development of a new technological way of life are of interest to scientists;
(ii) At the same time, scientific publications on the topic of the article are most often of a single nature, which may indicate the absence of powerful scientific centers for studying the process of forming a new technological order;
(iii) Synthesis of the paradigm of development of a new technological way can increase the efficiency of the processes of development of a new technological way;
(iv) The process of forming a new technological order may be the cause of the crisis, so there is a need to reduce the risk of a crisis.

This indicates the relevance of the topic of this article.

The paradigm of the entry of an organization (state, region, corporations, clusters, technological platforms, etc.) into the TTO will be called the systematic unification of such elements of activity: the philosophy of activity; the ideology of activity; the policy of the organization. The concept of "paradigm" can be considered quite close to the concepts of "concept", "model", and "method".

The concept can be interpreted as a systematic view of the process and results of the formation of this technological structure in society and the economy. At the same time, the paradigm harmoniously includes such parts as philosophy, ideology, organizational culture, politics, strategy, and tactics of such a transition to a new technological order.

The philosophy of the organization's entry into the TTO will be called the most general, wise view of this process and its results. There may be a philosophy of self-development of a new technological order. Such a philosophy implies the spontaneous self-development of a new technological order. This philosophy excludes the management of this process.

Another variant of this philosophy should be recognized as the philosophy of purposeful influence of the heads of organizations on the process of entering these organizations into the TTO. The practical significance of the philosophy of the organization's entry into the new technological way is to substantiate the principles of the policy of managing the process of organizations ' entry into the TTO.

The following provisions can be called the principles of the entry of organizations into the TTO:

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(i) The principle of focusing on achieving greater comfort and safety for the population;
(ii) The principle of scientific justification in managing the process of entering an organization into a new technological order;
(iii) The principle of rational use of the available resources of society and the economy;
(iv) The principle of minimizing conflicts in the process of forming a new technological order;
(v) The principle of minimizing losses in the process of transition to a new technological order;
(vi) The principle of managing the efficiency and risks of this process and others.

These principles can become the values of the organizational culture of the management system of the organization's entry into a new technological order.

We agree to call the organizational culture of the organization's entry into a new technological way: norms of behavior; beliefs; values of the organization; ways of responding to the problems of the organization's personnel in this process.

The ideology of the entry of organizations into the TTO can be called: firstly, the way of distributing managerial power in this process; secondly, the key idea of forming a new technological order (improving the safety and comfort of people's lives).

The policy of entering organizations (state, region, corporations, clusters, technology platforms, etc.) into the TTO in this article will be understood as a set of measures. Such a policy includes a set of measures aimed at modernization of the production capacities of organizations; modernization of the products of these organizations; improvement of the organization's management systems; design of new types of technologies (nanotechnologies, neurotechnology's, digitalization technologies, information technologies, resource-saving technologies, environmentally friendly technologies); the introduction of these new technologies into the products of previous technological orders; the development of new economic and social production institution; (Glushchenko, 2021d), etc. The activities included in such a policy should be harmonious and coordinated with each other.

The policy of entering the economy and society into the TTO includes strategy and tactics. The strategy is responsible for the long-term perspective of the entry of organizations into a new technological order (Glushchenko, 2021a). Tactics ensure the current implementation of strategic plans, taking into account the need to fulfill such requirements: the sustainable development of this process of entering a new technological order; ensuring the solvency of the organization and others.

The subjects of the paradigm formation should understand that the "technological order (way)" is a complex multi-level (hierarchical) system. Therefore, the main research methods should be the theory of hierarchical systems; system approach; system analysis; search heuristic forecasting, and others. The subjects of the paradigm development should take into account what we consider:

(i) "First of all, the very concept of system complexity depends on the point of view. What seems to a psychologist to be a complex or large system may turn out to be just an elementary link in the eyes of an economist";
(ii) "We can even say that the importance and wide prevalence of multi-level systems are not yet well understood".

This opinion of the theory of large systems is confirmed by the practice of forming an economic approach in the field of studying technological orders. Economists study the technological order as a purely economic object (Glazyev, 2016). Within the framework of this approach, scientists and economists define the technological order as a set of major global institutions. At the same time, economists express the opinion that the subject of

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technological development is the process of expanded reproduction of capital (Glazyev, 2016). Therefore, within the framework of the economic approach, there is no place for production technologies in the technological order itself.

It is more logical to assume that the structure of the technological order (as a large system) includes: firstly, the technological basis of the organization; secondly, the system of industrial and social relations(institutions); thirdly, methods of personnel management and its organization; fourth, forms of doing business; fifth, the world order and more. At the same time, the technological basis of the organization is primary. For this reason, all economic and humanistic elements should correspond to the specifics of the technological basis of organizations.

The paradigm (philosophy, ideology, policy) of the entry of organizations into a new technological order should be based on the methodology of the system approach. The systematic approach consists in studying and considering all the elements (parts) and/or properties of the technological order (object of research) in their mutual connection.

The system analysis of the TTO can be called: determining the structure of this mode; establishing the nature of structural connections of elements; studying the properties of elements; studying the composition and properties of the entire technological order as a whole.

The system analysis carried out in this article shows the presence of a system connection between the technological basis of organizations and the factors of the world order (Glushchenko, 2020a). The analysis shows that there is a systemic influence of the technological basis of organizations on the following elements: types of the state; types of money (gold, credit money; mottos; cryptocurrencies (Glushchenko, 2022a)); management methods in organizations; the type of the world currency system; forms of doing business in the economy, in the corresponding historical and, at the same time, technological periods of development.

On this basis, we will agree under the concept of "technological order" to understand the system integration into a single whole of such elements: the technological basis of production in the economy and society; social production relations; world order; types of business processes in the economy; management methods and tools; concepts of personnel management of organizations in the economy and society at a certain stage of the historical, technological, economic, social, cultural process of economic and social development.

The main provisions of the general theory of technological orders are described in (Glushchenko, 2021c). Further development of the general theory of technological orders should become an effective methodological tool for forming the paradigm of organizations ' entry into a new technological order.

Historical analysis shows that the invention of a sail for sea and river vessels as a mover can be called the first technological order. Presumably, the Egyptians invented the sail for sea and river vessels.

An example of a systematic analysis of the course of technological development of the economy and society is given in **Table 1**. In **Table 1**, a systematic analysis of the structure and content of elements of technological orders is carried out.

The system analysis of the entire historical technological process of the development of modern civilization carried out above allows: to form descriptive models of all technological structures that took place; to form a descriptive model of the TTO. A descriptive model of the TTO will be obtained in this article by combining descriptions of elements of this order (mode). To do this, you need to combine the contents of row # 10 of the tables given in this article.

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Table 1. System analysis of the structure and elements of technological orders (fragment).

No.	Properties of Technological Orders (Structures) /Number, Names Technological Orders, Period	New Types of Products; Types of Production Enterprises	World Order, Socio-Economic Formation; The Form of The State
(1)	(2)	(3)	(4)
1.	The first technological order; the period from 5500 BC to 2000 BC; sails for river and sea vessels	Products of agriculture and animal husbandry; organization of subsistence farming within the genus	The primitive communal system, rodos, tribes, slavery
2.	The second technological order; Period 2000 bc – 400 bc; Horse traction;	Natural raw materials, agricultural products, transport services; family, community	The basis of the world order are independent empires and states; in the form of government, states are monarchies; in the sphere of money, individual goods (grain, cattle, furs) act as an equivalent; gold as a universal equivalent; credit and currency transactions are carried out by money changers and usurers
3.	The third technological order; period 400 BC-9th century AD; The appearance of saddles for animals; the development of pack transport	Natural raw materials, agricultural products, development of trade based on pack transportation; Family as a production team	World order is based on individual states and empires; in the sphere of money, individual goods (grain, cattle, furs) act as equivalent; gold as a universal equivalent; credit and currency transactions are carried out by money changers and usurers
4.	The fourth technological order; Period 9th century-1770; Windmill, a water mill;	Flour, sunflower oil; products of mechanical processing of agricultural products; family, clan, craftsman, miller	Imperial world order; land empires; principalities; kingdoms; feudalism;
5.	The fifth technological order; Period 1770-1830; Textile machines;	Machine-made fabrics, manufactory products; textile manufactories, Enterprises;	Maritime empires; monarchies; capitalism;
6.	The sixth technological order; Period 1830-1880; Steam engine;	Steam engines; mechanisms; locomotives, rails; sleepers; international monopolies	Land and sea empires; monarchies; capitalism;
7.	The seventh technological order; Period 1880-1930; Electric motor and internal combustion engine;	Cars, diesel locomotives, airplanes, washing machines, refrigerators; radio, telegraph; multinational corporations,	Capitalism; imperialism; nation-states; republics; In the period 1920-1945, the multipolar world, which included three currency blocs and the ussr;

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Table 1 (continue). System analysis of the structure and elements of technological orders (fragment).

No.	Properties of Technological Orders (Structures) /Number, Names Technological Orders, Period	New Types of Products; Types of Production Enterprises	World Order, Socio-Economic Formation; The Form of The State
(1)	(2)	(3)	(4)
8.	The eighth technological order; Period 1930-1970; a nuclear bomb, nuclear reactor; automation of production; electronic computers;	Electronic computers, televisions; automation tools; flexible automated production complexes; multinational corporations,	The coexistence of two competing socio-economic systems; states, military-political blocs of states, and a bipolar world; the united nations (un)
9.	The ninth technological order; Period 1970-2010; Microelectronics and microprocessors;	Personal computers; atms; plastic bank cards; mobile phones; multinational corporations, virtual corporations; Strategic alliances of corporations	Globalization; global consumer society; disintegration of the socialist bloc of states; trade and economic blocs of states; military-political blocs of states; Global unipolar world, post-industrial society
10.	The tenth technological order; Period 2010-2040; SMART technologies; Nanotechnologies; bio-technologies; neurotechnologies;	3-D printing products, information products, the transformation of human thinking (clip thinking); global information systems; clusters; technology platforms	Networked world economic order; trade and economic blocs of states; optimization of state functions; The process of decentralization of the global unipolar world; Post-industrial global consumer society;

This descriptive model of TTO acts as an image of the future for the current period of historical and technological development.

This descriptive model of TTO acts as an image of the future for the current period of historical and technological development.

The image of the future TTO may include such structural elements:

(i) New elements in the technological base of organizations: Smart technologies; nanotechnologies; neurotechnologies; information technologies; digitalization technologies; resource-saving technologies; environmentally friendly technologies.

(ii) The sector of advanced economic development is a service sector, including science and education.

(iii) The main direction of the development of the monetary system: settlements in national currencies of global actors; the development of cryptocurrencies and digital money; settlements on the Internet.

(iv) The direction of development of management systems: distributed management systems; management of social development of personnel; application of neurotechnologies in management; development of design thinking.

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(v) Methods of competition between organizations: at the level of organizational cultures, organizational design, and company values.
(vi) Main types of resources: intellectual and financial resources.
(vii) New organizational structures in business will be technology platforms, clusters, an ecosystem approach, and others.

In turn, this image of the future becomes the basis for the formation of the paradigm of the development of the TTO. At the same time, the very paradigm of such development acts as a philosophical and ideological basis for developing a policy for the transition of organizations to the TTO.

The role of the paradigm of development of the TTO is related to the following. The formation of the correct paradigm for the development of the TTO will allow the organization to get the maximum effect in the process of technological development.

We explain the importance of effective development of TTO by the example of an organization such as the state.

The formation of the TTO means the transition of the technological base of advanced organizations to this ninth technological level. The products of enterprises of the ninth technological order will have a higher (ninth) technological level. For this reason, these products will be characterized by a higher monetary multiplier of innovation. The innovative money multiplier shows how many times the cost of the final product exceeds the cost of raw materials (Glushchenko, 2022a; Glushchenko & Glushchenko, 2016).

It is known that a modern automobile engine is about 30 times more expensive than the aluminum from which it is made. Timely modernization of this engine through the use of technologies of the TTO will increase its quality. The possibility of such modernization is confirmed in (Glushchenko, 2021b).

At the same time, the innovative money multiplier will increase. For example, this multiplier will become equal to 38. This means that a particular company will receive more profit. This means an increase in revenues to the country's budget. This means an increase in the hardness of the national currency. This means increasing the stability of the national monetary system.

At the same time, the increase in the stability of the national monetary system will be the result of the fact that the innovative money multiplier will be significantly larger than the bank money multiplier. As is known, the bank multiplier characterizes the effect of increasing (multiplying) money on deposit accounts of commercial banks as a result of their movement from one economic entity to another. In this case, the total value of goods is greater than the money supply in the economy. Therefore, in this case: there is no development of inflation; the national currency is solid.

At the same time, the gross domestic product increases; the volume of budget funds increases; the country's development opportunities grow.

If the modernization of the economy is not carried out, then there is a drop in the competitiveness of products. In this case: the gross domestic product is falling; the amount of budget funds is decreasing; the socio-economic crisis is developing; the geopolitical situation of the state is deteriorating.

The paradigm of an organization's entry into the TTO can be formed based on consensus or a confrontational basis. The paradigm of the development of the TTO in the organization is consensual if all subjects agree with its provisions. This paradigm has a confrontational character if its implementation is accompanied by conflict.

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The analysis shows that there is a relationship between the specifics of technologies and the characteristics of public institutions. If the nature of institutions does not correspond to the specifics of the technological basis of organizations (world order, state, firm, etc.), a systemic crisis arises. This kind of crisis reflects the process of transition of the economy and society from one technological way to a new technological way. At the same time, the crisis will continue until the nature of State institutions comes into line with the requirements of technological progress.

Therefore, the formation of an effective paradigm and policy for the transition of organizations to the TTO is very important for organizations in the 21st century.

Therefore, the paradigm of transition to a new technological order should include measures aimed at detecting mental conflicts. Great attention should be paid to the rule of law and respect for human rights (Glushchenko, 2018b).

If we talk about the composition of technological directions in which, as predicted, the development of the TTO will take place, then we can say the following.

The method of system analysis of the technological order is described in (Vladimirovich, 2021). The paradigm and policy of transition to a new technological order should include measures: firstly, for the development of new technologies; secondly, measures for the development of social institutions.

It should be remembered that it is the disharmony between the essence of technologies and the content of production institutions that is the source of the crisis.

Some researchers believe that the TTO will be based on nanotechnologies. However, a more advanced system analysis has shown that the technological basis of this technological order will be: neurotechnologies; nanotechnologies; information technologies; resource-saving technologies; digitalization technologies; environmentally friendly technologies (Glushchenko, 2021c).

The sources of new scientific achievements will be a deeper penetration into the structure of the material world (nanotechnology); a more adequate knowledge of the work of the human brain (neurotechnology); more rational use of raw materials; minimizing damage to nature and more.

The following areas of work can be included in the structure of the paradigm of the organization's transition to a new technological order:

(i) Development of proposals for the further development of methodological provisions of the general theory of technological orders;
(ii) Development of research on practical problems of the general theory of technological orders in specific sectors of the national economy and society;
(iii) Formation of a set of measures to improve the effectiveness of social development programs for society and individual social groups;
(iv) Development of legal norms and a set of measures aimed at the formation of technological platforms and clusters that carry out the development of new technologies of the tto (nanotechnologies; neurotechnologies; information technologies; digitalization technologies; resource-saving technologies; environmentally friendly technologies);
(v) Formation of a system of measures aimed at the development of social and industrial institutions of the tto;
(vi) Creation of a multi-contour management system for the development of industries of a new technological order;
(vii) Development of a set of measures for the formation of a set of indicators to assess the effectiveness of the development processes of the tto, and much more. At the same time, all these directions of this paradigm should be coordinated with each other.

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We consider these areas of the paradigm of the organization's transition to a new technological order in more detail. Proposals for the further development of the theoretical provisions of the general theory of technological orders may include the development of methodology as part of all the functions of this theory. These are the following functions of the scientific theory of technological orders: integrative function; methodological function; prognostic function; preventive function; function of knowledge socialization; instrumental function. The content of the function of the general theory of technological orders is reflected in more detail in the work (Glushchenko, 2021c).

The category of events for the development of applied problems of the theory of technological orders by branches of the national economy can include the formation of branch directions of the theory of technological orders.

The practical geopolitical direction of the general theory of technological orders can solve the following tasks: defining the shape of the future world order, and world economic order; forecasting geopolitical changes; assessing the geopolitical consequences of the development of a new technological order; developing adequate geopolitical measures, and others. The significance of this direction of the theory of technological orders is evidenced by the fact that the First and Second World Wars arose during the 6th and 7th technological orders. These wars were the result of changes in the economic power of States. In the middle of the 8th technological order, the collapse of the USSR occurred.

This collapse was largely due to the technological lag of the USSR from the leading countries. As a result of the collapse of the USSR, the bipolar world was transformed into a unipolar world. It can be predicted that in the TTO, the technological and economic differentiation of countries will increase. Therefore, the geopolitical results of the development of TTO will be even more significant.

The analysis shows that a hypothesis can be put forward about the network nature of the future world economic order, world order. This hypothesis requires its confirmation or refutation within the framework of scientific research and observations of real processes. The reason for putting forward such a hypothesis may be, firstly, that a multipolar world already existed in the period 1920 to 1945. Then there were three currency blocs and the USSR (the four poles of the world) in the international arena.

So just going back 100 years probably wo not work? Secondly, the development of technology has led to the formation of a network community; network economy; network marketing; consumer society in general. In turn, the consumer society in the process of its development will create a networked world order. If such a trend develops further, will it lead to an increase in the importance of horizontal ties between states and their national economies? Will this lead to an increase in the number of associations between states and their economies based on mutual interest? Then the geopolitical significance of the state will largely be determined by the set of products that this state can offer to the global consumer society.

The political science director of the theory of technological orders (structures) can solve the following tasks: justification of programs for the development of the national economy and society; restructuring in the system of state law; development of adequate scientific and technical policy; justification of changes in social and industrial policy during the TTO. Since the development process in the period of the sixth technological order is becoming more and more complex, will this lead to an increase in the importance of political science and political activity?

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The applied sociological direction of the general theory of technological orders can deal with the issues of forecasting: trends in demographic development; forecasting the social structure of society; estimating human life expectancy; forecasting changes in the sphere of family relations, and others.

The culturological branch component of the general theory of technological order can carry out studies of cause-and-effect relationships between the features of the technological order and cultural trends. This kind of interrelationships can be studied in the following areas: fiction; painting; theater and cinema; pop music and others.

The medical branch theory of technological orders will be practical. The medical branch theory of technological orders should investigate such problems: technical progress in the field of medical equipment; cause-and-effect relationships between the frequency of occurrence of various diseases and the characteristics of the technological order. For example, it should be recommended to study the dependence of the number of diseases of the heart and other organs on the characteristics of the technological order. Such studies allow you to carry out: the prognosis of the development of various types of diseases during the TTO; design new medical equipment based on new technologies; modernization of existing medical equipment by introducing technologies of the TTO.

In the process of industry research, a systematic analysis of the development of certain industries can be carried out. For example, in the field of medicine, two tables can be developed. In one table, it can be recommended to display the change in the structure of the frequency of various diseases in the population, depending on the technological order. The second table can describe the process of development of medical equipment in the periods of specific technological orders.

Within the framework of the paradigm of the state's entry into the NTO, there should be a program for the development of individual technological platforms. These technology platforms should be engaged in the development and implementation of new technologies in practice. As already noted, new technologies include nanotechnologies; neurotechnologies; information technologies; digitalization technologies; environmentally friendly technologies; resource-saving technologies. The tools for the development of such platforms are described in (Glushchenko, 2020b).

Within the framework of the paradigm of the state's entry into the TTO, there should be a program for the development of new technological platforms. These technology platforms should be engaged in the development and implementation of new technologies in practice. As already noted, new technologies include nanotechnologies; neurotechnologies; information technologies; digitalization technologies; environmentally friendly technologies; resource-saving technologies. The tools for the development of such platforms are described in (Glushchenko, 2020b).

However, new technologies will develop successfully only if new production institutions contribute to their development.

The mechanism of development of new industrial and social institutions of the NTO is described in (Glushchenko, 2021d). The process of forming a management system for the formation of the TTO is presented in (Glushchenko, 2020c).

Measures for the formation of a set of indicators for analyzing the effectiveness of the development processes of the NTO will be described in the part called "Discussion" of this article.

It is recommended to include the commercialization of new technologies and innovations among the most important tasks. The process of obtaining economic benefits from the repeated use of new technologies should be organized in the national economy. Multiple

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introductions of new technologies can be called "technology multiplication". Such "technology multiplication" should be carried out by purposefully introducing these new technologies into existing products. The method of modernization of products or production capacities of firms when they enter the TTO is as follows:

(i) It is recommended to study the composition of each of the types of technologies of the TTO (CMART technologies; nanotechnologies, neurotechnologies, and others).
(ii) It is necessary to study the principle of operation of the structural elements of the modernization object.
(iii) Next, it is necessary to synthesize specific proposals to improve the comfort and safety of the practical use of the modernization object.
(iv) After that, it is necessary to analyze the possibility of introducing new technologies into an existing modernization object (products and production facilities of the company).
(v) It is necessary to create a project for the introduction of new technology into the object of modernization.
(vi) It is necessary to analyze and evaluate the real impact of the new technology on the comfort and safety of the modernization object.
(vii) It is recommended to obtain an assessment of the economic effect of the work on the modernization of this object.

The economic efficiency of the introduction of new technologies in the economy is determined by the number of such implementations. When a new technology is introduced, it is systematically combined with the technologies of previous technological orders. To characterize the intensity of the process of introducing new technologies in the economy, we will introduce the concept of "technology multiplication". The concept of "multiplication of technologies" in this paper will act as an integral characteristic of the number and depth of integration of new and old technologies in the economy during the transition to a new technological order.

The concept of "multiplication of technologies" allows us to assess the economic efficiency of using new technologies in the national economy of the country. The greater the number of integrations of new technologies with technologies of previous technological orders, the higher the economic efficiency of new technologies.

The subjects of the development of the paradigm for the entry of organizations into the TTO can be international organizations; national academies of sciences; national governments; political parties; top managers of corporations; heads of clusters and technology platforms; ecosystem developers, developers of new technologies themselves, and others.

As subjects of the development of the paradigm of the organization's entry into the TTO, they can develop their ideas. For example, political parties can present their ideas on such issues: as strengthening the geopolitical position of the state; optimal distribution of productive forces in the economy; increasing the efficiency of the process of socio-economic development; harmonization of social and industrial relations; development of culture; improvement of medical services for citizens and other issues. In the Parliament, political parties can take legislative initiatives. These draft laws can be focused on the synthesis of legal norms that contribute to the acceleration of the development of the TTO.

At the same time, political parties should provide support and mentor to those entities whose activities contribute to the formation of the NTO in the economy and society. Such social and economic assistance (mentoring) concerning the developers of new scientific and

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technical ideas is very important. Such assistance to developers is especially important in the initial period of development of the TTO.

Public business associations should also provide support to developers of new technologies.

An important element of the support system for new technologies is the work of business angels and venture funds. Developed countries have their systems of support and mentoring of innovations. In countries where such a mentoring system does not exist, there is a "brain drain". This reduces the pace of development of such states.

Therefore, the paradigm of organizations entering the TTO should contain measures to support developers of new technologies.

A necessary element of effective management of the entry of organizations into the TTO is the formation of a system of indicators of the effectiveness of this process. It is proposed to include the following characteristics in such a system of indicators:

(i) The share of products (goods and services) belonging to the TTO in the total output of the national economy;
(ii) The share of production technologies related to the TTO in the technological basis of the national economy;
(iii) The share of employees engaged in the production processes of the TTO;
(iv) The amount of revenue per employee at enterprises of the TTO;
(v) The cost of fixed assets of enterprises belonging to the TTO;
(vi) The contribution of enterprises of the TTO to the gross domestic product of the country;
(vii) The rate of the annual increase in the share of firms of the NTO in the gross domestic product of the state;
(viii) The share of fixed assets of the national economy that are used in the activities of organizations belonging to the TTO;
(ix) The volume of "brain drain" or the influx of high-tech personnel into the economy.

To determine these indicators, it is necessary to propose criteria based on which an organization or a product can be attributed to the TTO. In this article, it is proposed to create a rating of states that best solve the problem of entering the NTO. In this case, the indicators described above can be used.

In the process of developing a paradigm for the entry of organizations into the TTO, it is necessary to take into account the situation of a qualitative leap in the development of scientific and technological progress. Such a leap is associated with the formation of the TTO. At the same time, the fact of the existence of a qualitative leap in scientific and technological progress makes it impossible to use such research methods: the continuation of existing trends; the use of statistical methods; the use of analytical models. In the conditions of a qualitative leap in the development of the forecasting object, heuristic methods gain an advantage.

Another characteristic feature of the process of synthesis of the paradigm of the organization's entry into a new technological order can be considered the following. Such a paradigm should be systemic. This means that in such a paradigm, elements that have a technical, economic, and organizational nature should be systematically combined.

At the same time, the very process of forming such a paradigm can be recognized as a research strategic project. This project of developing such a concept is based on the application of methods of many sciences: geopolitics, economics, sociology, technical sciences, theory of technological order, and others.

Therefore, the third feature of the process of synthesis of the paradigm of the organization's entry into the TTO is as follows. All proposals included in the paradigm of

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entering the TTO must be scientifically justified. The lack of scientific justification for the activities included in this paradigm can lead to errors.

The third methodological feature of the paradigm of transition to a new technological way is that such a paradigm is formulated for the entire period of existence of this technological way. Therefore, the paradigm under consideration should be formed throughout the entire life cycle of a new technological order in the global and national economy. Therefore, such a paradigm of transition to TTO should be developed for the period up to 2030-2040. The fourth feature of such a paradigm may be that this paradigm should also cover risk analysis. Based on the results of such an analysis, it is necessary to compile a list of measures aimed at reducing the level of risks of the entry of organizations, and the national economy into the TTO.

The fifth characteristic feature of such a paradigm is that it is necessary to use the methodology of predictive analysis. Such a predictive analysis is focused on analyzing not the current, but the future situation. This predictive situation is formed in the process of entering the 10th technological order.

The sixth feature of the studied paradigm is as follows. The content of this paradigm should be critically reviewed periodically. When significant changes observed in the external and internal environment of the national economy and society are detected, adjustments should be made to this paradigm.

The seventh feature of this paradigm is the following. This paradigm should initially be formed as a flexible document. This means that this paradigm should initially include the possibility of making changes to goals and tools in the event of a change in the situation.

We will keep in mind that the process of practical implementation of the approved paradigm of transition to the 10th technological order is closely related to the following processes: the development of new technologies and products; the introduction of these new technologies and products; the restructuring of the entire old economy. These changes in the sphere of production lead to changes in the sphere of professional relations and social institutions of society.

The introduction of new technologies changes the positioning of these organizations. Therefore, in the process of restructuring the economy and society, there is a need to rebrand the subjects of this process (government agencies, clusters, clusters, ecosystems, technology platforms).

Such a rebranding can be used by an organization (state, corporation, and others) to strengthen its position in the international arena and markets. At the same time, it should be taken into account that the rebranding procedure allows you to change the philosophy of activity and carry out internal coordination of activities in the organization.

The term "brand" is described in the book on marketing. We agree to understand the brand as a corporate symbol (sign) that reflects the style and effectiveness of the management system in the organization. Such a brand forms and reflects the competitive position of the organization in the international and national economy, and the system of geopolitical management.

Positioning and using such a brand can affect the effectiveness of various types of management (geopolitical, social, corporate, etc.).

The situation of the global crisis leads to the need for changes in the functioning of management systems of organizations. The changes proposed during the rebranding should increase the efficiency and improve the perception of management processes in all areas: production processes; education and science; social environment; in the international

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community; contribute to improving the situation in the markets; increase loyalty and efficiency in the work of personnel.

To solve this set of tasks, one of the most effective tools can be rebranding. When rebranding government agencies, you can apply the methods used in marketing. This is because the state (to a certain extent) can be considered a geopolitical non-profit corporation in the post-industrial global world.

Under the rebranding of the management system in this article, it is proposed to understand the purposeful change of the image and brand of such a system. Rebranding is carried out to improve the perception of the management system in the external and internal environment of the organization.

The decision on rebranding should be scientifically justified. To this end, it is necessary to form the methodological foundations of such a rebranding.

The philosophy of rebranding an organization is understood as the most general wise idea of the need, conditions, concept, process, and expected results of such a rebranding.

Therefore, there should be an element in the paradigm that describes the rebranding options. Such rebranding should be accompanied by the development of a private rebranding program for a specific subject of the TTO.

When forming the general concept of the organization's transition to a new technological order, it may be proposed to rebrand the organization. The need for rebranding may be related to many factors: a change in the positioning of the organization; a change in external conditions; a change in the internal environment of the organization; a change in organizational culture and others. With deeper analysis, it is possible to show exactly what such a rebranding may consist of.

A variant of the rebranding policy of organizations was published in. The idea of such a rebranding could well find interested readers. Further development of the methodology of rebranding organizations led to the formation of a detailed theory of rebranding, reflected in many publications (Glushchenko, 2020d). Such a scientific theory of branding and rebranding of organizations can be useful. This is because it contains a methodology that can be practically used by various economic entities in the process of their entry into the TTO.

At the same time, the development of the paradigm of the development of the 10th technological way and the theory of technological ways as the core of scientific support for the development of a new technological way opens up new opportunities. These opportunities exist both for the development of science itself and for the practice of developing a new technological order in economic sectors and various geographical regions.

The technological theory of post-industrial money can be considered a structural element of the theory of technological orders (Glushchenko, 2022a).

These new, unprecedented opportunities for science and practice are connected with the fact that the obtained scientific results allow us to logically justify the creation of programs for the modernization of products and production capacities of enterprises of the real economy.

However, when developing such programs, it should be understood that any knowledge about an object contains explicit and implicit knowledge about this object. Implicit knowledge arises at the junctions of subject areas. In addition, implicit knowledge can arise in the process of combining individual elements into a single system. Implicit knowledge is the knowledge that cannot be expressed verbally (for example, the text in a scientific article or the text of the methodology of the program).

Implicit knowledge can be transferred only in the process of direct communication with an expert. This is exactly the case: students did not understand what was being said when they

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read only the text. At the same time, students understood well what they needed to do and could complete a practical task after communicating with the head of their educational project.

The materials of the theory of technological orders were practically tested in educational projects, which consisted of the modernization of products and production facilities through the use of technologies of a new technological order.

You can increase the level of your training for the correct perception of the theory of technological orders by reading materials on the theory of hierarchical systems. This is because the technological order, as the object of research, belongs precisely to the category of complex hierarchical systems.

At the same time, the theory of technological orders itself is based on the theory of hierarchical systems (and not on economic theory). Therefore, mastering the basics of the theory of complex hierarchical systems creates a kind of "multidimensional" scientific thinking, which differs from a purely economic approach.

The methodological basis of the theory of technological s orders can be considered system engineering (but not economic theory). At the same time, the knowledge of the theory of technological orders can become a mental basis for ensuring the competitiveness of organizations in a new technological order.

The formation of an organization's modernization program in the process of mastering a new technological order (way) can strengthen the competitive position of this organization in the market.

And, conversely, the absence (due to a lack of understanding of such a need) of an enterprise modernization program can lead to a loss of competitiveness of this organization in the conditions of the formation of a new technological order.

In general, scientific research shows that the transition to a new technological order affects all aspects of society. Scientists note the formation of a network society (Ravochkin, 2021). The analysis shows a change in the level of influence of various factors in society (Ravochkin, 2021).

There is a change in social relations, including the world order [46, pp. 67-69]. This could be the source of the crisis. The joint use of the scientific theory of crisis management and the theory of technological orders can: identify the sources of crises; reduce the damage from crises; form rational ways out of crises (Glushchenko, 2022b).

For the first time in history, the theory of technological orders creates an opportunity for a purposeful and controlled (and not random, chaotic, as it was before) transition of your organization into the mode of competitive functioning of the organization with the onset of a new technological order.

Therefore, the development of such a modernization program can become a competitive advantage for the organization that will develop a modernization program. This is the anti-crisis significance of the theory of technological orders.

4. CONCLUSION

The article describes the content and scientific and practical significance of the paradigm of the development of scientific support of the 10th technological order in the world economy. This article proves that the synthesis of the paradigm of transition to a new technological order allows for optimizing the process of the formation of new scientific knowledge for a given period. In addition, the creation of a paradigm of transition to a new

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technological order reduces the likelihood of accidental occurrence, and adoption of paradoxical, inefficient management decisions by the management bodies of organizations. The article develops a methodology for the formation of a paradigm for the entry of various types of organizations (world economic order, states, corporations, and other types of organizations) into TTO in the economy and society. The paradigm is understood as a systematic combination of such elements: philosophy; ideology; organizational culture; the policy of the organization's accession to the TTO.

The article discusses and substantiates the concept of "technological order". The technological order is understood as the system integration into a single whole of such elements: the technological basis of the organization; production institutions; forms of doing business; methods and management structures in organizations.

The article proves that the technological order is a large multilevel system. Therefore, the study of technological orders should be carried out within the framework of the theory of large systems, system analysis, and synthesis.

The article describes the content of these elements of the paradigm of the organization's entry into a new technological order. The article proves that the beginning of the development of such a paradigm should be a systematic analysis of the technological order. Based on this system analysis, an image of the future of the new tenth technological order can be synthesized.

The article describes the practical tasks of many branch theories of technological orders (geopolitics, politics, sociology, culture, medicine).

The article proves that the rebranding of organizations can be an important part of the process of joining an organization to the TTO. The article proves that the application of the theory of technological orders together with the theory of crisis management will reduce the risk of socio-economic crises.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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