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FORECASTING THE DIRECTIONS OF MODERNIZATION OF ECONOMIC SECTORS AND REGIONS OF THE COUNTRY DURING THE DEVELOPMENT OF THE EIGHTH TECHNOLOGICAL ORDER

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ABSTRACT

The subject of the article is forecasting the directions of modernization of economic sectors and regions of the country during the development of the eighth technological mode (ETO); the object of the article is the 8th technological mode in the economy of the country; the purpose of the work is to increase the efficiency of forecasting the processes of formation of the eighth technological mode; to achieve this goal, the following tasks are solved: synthesis of a system-descriptive model of the 8th technological order (ETO); formation of prognostic branch system models of scientific and technological development (fuel and energy complex, military-technical sphere, region of the state); research of factors of ecosystem approach and nature-like (convergent) technologies; description of methods of formation of an effective business plan of an innovative project; scientific methods in the article are logical and historical analysis; synthesis; theory of forecasting and planning, theory of technological orders, theory of modeling; project approach; expert assessments; the scientific novelty of the article is connected with the formation of a methodology for predicting the development of the eighth technological order.

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1. INTRODUCTION

The relevance of the study is determined by the importance of improving the methods of forecasting the directions of development and improving the development management system of the eighth technological order (ETO). Management of the development of branch areas of the VETO includes the implementation of the following management functions: planning of industry innovations; organization of innovation activities in the industry; motivation of industry personnel; control of the results of innovation activities. Forecasting usually precedes planning. Forecasting can be exploratory (defining development goals) and normative (determining ways to achieve goals). Improving the effectiveness of innovative projects can be achieved by: forecasting optimal goals and ways of developing industries; synthesis of effective ideas; formation of a conceptual approach to innovation; transition of organizations to a project model of activity; improvement of business planning of innovative projects and other innovations. The transition to the use of the project model of the activities of enterprises (organizations) will

have a positive impact on the implementation of the function of organizing innovative projects during the development of ETO. Such a transition to the project model of organizations (enterprises) will increase the validity of motivation and control of the results of innovative activity in the organization.

The hypothesis of this article is the assumption that: forecasting the scientific and technological progress of the industry based on system models, developing a project approach, implementing a project model of organizations' activities and improving the methodology of business planning of innovative projects during the development of VETOS will ensure the sustainability of development and increase the economic efficiency of innovative projects of enterprises in the forecast period (2021-2040).

The purpose of the work is to increase the efficiency of forecasting the processes of formation of the eighth technological order; to achieve this goal, the following tasks are solved:

- synthesis of the system-descriptive model of the 8th technological order (WTO);
- formation of predictive industry system models of scientific and technological development (fuel and energy complex, military-technical sphere, region of the state);
- studies of ecosystem approach factors and nature-like (convergent) technologies;
- description of methods for forming an effective business plan for an innovative project;

The object of the article is the 8th technological order in the country's economy.

The subject of the article is forecasting the directions of modernization of economic sectors and regions of the country during the development of the eighth technological order (WTO).

The study of the content of scientific publications on the topic of this work assumes the following. Forecasting of development processes is a function of the governing bodies of the country's regions Vanchikova and Arkhipova (2015).

Forecasting is an important element of the management of scientific and technological progress Rafikova (2020). Patent analysis can be used to predict scientific and technological development Perepechko and Zukerblat (2020). Forecasting plays a particularly important role in high-tech engineering Gaponenko and Soboleva (2019). Важно It is important to improve the efficiency and methods of business planning in the activities of firms Katsibaev (2016). During the ETO period, the transition of organizations to the project model of the work of organizations is predicted Glushchenko (2021). For this reason, the development of the design methodology of higher engineering education is predicted Glushchenko (2021).

Improving the effectiveness of forecasting the results of innovative projects in this area can be achieved by: improving the accuracy and reliability of forecasting the directions of development of economic sectors; increasing the effectiveness of the ideas of innovative projects of companies; developing a methodology for the comprehensive modernization of the regions of the state and economic sectors. The task of increasing the effectiveness of innovative ideas is carried out by applying the theory of solving inventive problems Altshuller (1986), Vikentiev and Kaikov (1992).

Innovative ideas can be synthesized by the following methods: on the basis of analogy with already occurred earlier in practice, success stories of others How to

become enterprising and rich (1991); the method of marketing the study of markets and buyers Kotler (1990).

You can improve the forecasting results of the development programs of innovative projects on the basis of application methodolgy, called "systems engineering"Potapov (2016), Sychev (2018), Orlova (2019).

To ensure the accuracy and reliability of forecasting the results of the analysis of innovative projects, researchers need to perform: pre-investment analysis and research of innovative projects Kurilova (2017) modeling for the purpose of system ranking of innovative projects of the corporation Tsapenko (2015). A new trend in the development of organizational forms of innovation activity during the ETO period can be considered the development of: technological platforms and clusters in the economy V. Glushchenko and Glushchenko (2015); ecosystem approach; convergent (nature-like) technologies.

In the initial period of ETO development, the importance of synthesizing new scientific theories increases. At the same time, new scientific theories create conditions for generating new concepts of ETO development. Such theories create additional opportunities for an integrated approach in the process of modernization of industries and regions V. Glushchenko and Glushchenko (2015), Valery (2021), Glushchenko (2021).

The effectiveness of innovative project management can be improved by applying the project model of the company's activities. A comparative analysis of the design and process models of enterprises' activities is carried out in work Glushchenko (2021). The analysis shows that promising areas for generating innovative ideas during the ETO period can be: the concept of nature-like (convergent) technologies Kovalchuk (2021), Kovalchuk (2021) development of a methodology for designing and creating ecosystems Borovik and Doroshenko (2020).

An important part of the successful implementation of an innovative project is the formation of an effective project team (project team) Glushchenko (2020). In the process of its development, the following may be important: the formation of the theory of management of this process and educational policy Glushchenko (2021) development of a strategic approach to the management of innovative projects Glushchenko (2006) synthesis of innovation policy and strategy for the company [26, p. 2]; development of labor economics methodology Glushchenko and Glushchenko (2016) formation of a personnel motivation system in the innovation activities of corporations Glushchenko and Glushchenko (2019).

It is proposed to assess the competence of the project team based on the results of the innovative project obtained by this team in the conditions of ETO Glushchenko and Glushchenko (2016), Glushchenko (2021). Based on the assessment of the real competence of employees, it is necessary to increase the effectiveness of competitive procedures for selecting employees to the innovation project team Glushchenko (2021), Glushchenko (2021). The analysis shows that mental conflicts can also be a source of risk in innovative projects in the conditions of ETO Glushchenko (2021), Glushchenko (2021).

The development of new systems of professional and social relations (institutions) in ETO should be recognized as an important part of the process of forming a new ETO Glushchenko (2021), Glushchenko (2021). To reduce the risks of the development of a new technological order, it is necessary to increase the efficiency of management Glushchenko and Glushchenko (2000), Workbook on forecasting (1982). Risk management of innovative projects to reduce risks of this kind Glushchenko (2006), Glushchenko and Glushchenko (2014).

An important role in the development of the ETO can be played by: the formation of new types of venture innovation funds and the system of innovative entrepreneurship Valery (2021) improvement of the methodology for the development and implementation of innovative projects Valery (2021).

At the same time, ETO technologies in 2021 already have a comprehensive impact on all aspects of the economy and the life of global society, including the development of neuromarketing, neuromanagement, neuroeconomics, neurogeopolitics Glushchenko (2021), Glushchenko (2020), Glushchenko (2020).

The analysis of scientific publications on the topic of this article confirms the relevance of the chosen research topic.

2. METHOD

Forecasting the development processes of ETO should increase the efficiency of the management processes of scientific and technological progress in the sectors of the economy and regions of the country during the transition from one technological mode to another technological mode. Without forecasting the development processes, the risks of this process may increase. The reasons for increasing the risk of sustainable development of a country's region (corporations, branches of the economy, society) may be: physical and/or moral aging of the technological base of a branch of the economy or a region of the country; violation of the proportions between the elements of socio-economic development; loss of competitiveness of products caused by moral aging; change in the structure of global markets and the economy; lag in the development of new social and professional institutions, etc. and others. The unpredictable and uncontrolled development of ETO increases such risks. History testifies to the extent of the damage caused by the risks of the development of a new technological way: catastrophic geopolitical risks arise during periods of crises that accompany the change of technological ways.

During the formation of ETO, the risk of sustainable development of the subjects of this process can be considered at several hierarchical levels: global-geopolitical; state; economic sector; region of the country; corporation, etc.

It is possible to reduce the risk of sustainable development of the country's region by predicting the situation and taking adequate measures of this orientation: preventing the growth of imbalances in the development of economic sectors and regions; taking measures aimed at the development of innovative activities; by taking adequate measures to modernize and restructure socio-economic relations and other measures.

The development of predictive industry models of scientific and technological development within the framework of the theory of technological structures can become a tool for shaping the directions of development of these industries.

Forecasting the directions of development and a conceptual approach to the development of ETO increases the efficiency of managing the transition of the economy and society to a new state. The conceptual approach makes it possible to synthesize a whole range of innovative tasks, the coordinated solution of which makes it possible to ensure the competitiveness and sustainability of the development of the subject, the region of the country in ETO.

At the same time, in 2021 there is still no unified concept in the field of the theory of technological order

s. There is no agreed opinion on the issues of names and identification of numbers of technological orders. A significant number of researchers believe that ETO, which develops in the period from 2010 to 2040, should be considered the 6th technological order. But this periodization of technological orders (structures)

includes only the phase of capitalist economic development. However, it is obvious that the process of technological development existed before capitalism. Based on this, it is more correct to carry out the periodization of technological orders for the entire period of development of human civilization.

The emergence of new types of engines is considered a factor in the periodization of technological structures. Analysis of the pre-capitalist period of development has shown that it is possible to distinguish such periods of time: firstly, it is the period of time associated with the use of horse traction; secondly, the period of time associated with the invention of windmills and watermills. These are two technological orders (ways) of the pre-capitalist period of human development. If we add six technological modes to these two technological modes, then we must assume that in 2021 humanity lives in the eighth technological order (ETO).

At the same time, it is known that the sail was invented by man about 5 thousand years BC. The sail was supposedly invented by the Egyptians. Wind power was used in the sails. The invention of the sail by the Egyptians can be considered a zero ("0") technological order.

In this paper, it is proposed to call the use of horse traction by a person the first technological order (way). The first technological order continues for a period of time, starting from 2000 BC and ending with the 9th century AD. The second technological order is associated with the invention of windmills and watermills by man. Wind engines used the power of water and wind. The second technological order begins with the 9th century and continues until 1770. The third technological order covers the period from 1770 to 1830. This technological order is not related to the engine. The third technological mode was called "textile machines". The fourth technological order is called the "steam engine". Its duration is from 1830 to 1880. The fifth technological order existed in the period from 1880 to 1930. The fifth technological order is characterized by the invention of an electric motor and an internal combustion engine. At the same time, the history of technology suggests that the serial production of internal combustion engines begins in the period 1900-1910. So the Wright brothers' airplane was invented in 1903. The Ford T production car has been mass-produced since 1908. Internal combustion engines are the most important part of an airplane and a car. Therefore, we can say that in the period 1990-1910, reliable and economical internal combustion engines already existed. Therefore, the fifth technological order should have the name: "electric motor and internal combustion engine".

The sixth technological order is proposed to be called: "nuclear reactor and computers". The nuclear reactor as a type of propulsion systems and a source of electricity was invented in the mid-1950s. For the period of time from the 1930s to the 1950s, the invention and creation of electronic computing machines (computers) accounted for. It is known from history that the first fairly complete computer analogue appeared in 1941. The creation of a computer required the development of a new science - technical cybernetics. Computers are the largest not only technical, but also civilizational invention. The advent of information technology using computers has changed the existing world. The creation of a nuclear reactor and a computer falls on the 6th technological order. The sixth technological order covers the time period from the 1930s to the 1970s. In this scientific article, the 6th technological order will be called: "nuclear reactor and computers".

The seventh technological order is associated with the development of new production technologies and new materials (semiconductors) This technological order (structure) is dedicated to the development of microprocessor technology and microelectronics. The seventh technological order covers the period from 1970 to

2010. The eighth technological order is also connected with the development of new technologies. The eighth technological order will be called for brevity: "nanotechnology". The eighth technological order will be associated with the development of such types of technologies: neurotechnologies, nanotechnologies; information technologies; digitalization technologies and much more.

The eighth technological mode is characterized by the creation of a scientific theory of technological orders (modes) Glushchenko (2021).

Search prediction can be used to determine the shape of the future ETO. The image of the future of ETO is a descriptive model of ETO. This model should reflect the structure and main characteristics of the ETO. Such a model can be obtained by the method of heuristic forecasting. The image of the future of ETO can be considered according to its structural directions: science, innovation and education are recognized as key resources for the development of society; acceleration of scientific and technological progress in all spheres; advanced development of the service sector; intensification of innovation; integration of fundamental and applied science, innovation; development of neuromarketing and neuromanagement in the field of management; advanced developments will receive the development of ecosystems and/or nature-like (convergent) technologies; the social sphere will develop in the form of ecosystems; management in science and education will become increasingly distributed; projects will become the main organizational form of the development of science and education; research and innovation will move to small laboratories and project teams (groups); the science and practice of the project approach in science and education will develop, and much more.

Further development of science and technology in ETO will be associated with the following trends: firstly, the development of scientific theories (ecosystems, nature-like technologies, technological theory of money and others) will become a stage of an innovative project; secondly, innovations in the field of new nanotechnologies and/or nanomaterials will be associated with an ever deeper penetration into the essence, structure and nature of the material world (nanotechnology, environmentally friendly technologies and resource-saving technologies); thirdly, innovations in the field of neurotechnologies, intelligent technologies, information technologies will be associated with an increasingly deep and comprehensive study of the properties of the human brain and the human psyche, etc.

To predict the shape of the future (models) of ETO in various fields of activity (military, fuel and energy complex, medicine, etc.), regions of the country and sectors of the economy, it can be recommended to develop sectoral system models of scientific and technological progress. These models will have a predictive property.

The system model of the shape of the future in the field of the fuel and energy complex is reflected in Table 1.

Table 1 System model of the sequence of technological structures in the field of fuel and energy complex

№ п/п	Properties of technological orders /Number, name of technological order, time period,	Energy source	New types of fuel	energy machines
1	The first technological order, Horse traction, the period 2000 BC. – IX century AD;	Physical strength of people and animals	firewood, coal, animal excrement	Horse-drawn traction

2	The second technological order, windmill, watermill; period IX century - 1770;	Wind and water energy, physical strength of animals,	animal excrement, firewood, coal	Sailing ships, Windmills and watermills
3	**The third technological order, Textile machines; Period 1770-1830;**	**Wind and water energy, physical strength of animals,**	**Firewood, coal, animal excrement,**	**Sailing vessels, horse-drawn traction, Windmills and watermills**
4	The fourth technological order, Steam engine; period 1830-1880;	Energy of the burned fuel, steam	firewood, coal, animal excrement,	Steam engine
5	Fifth technological order; Electric motor, Internal combustion engine; period 1880-1930;	Energy of burned fuel, oil products, wind and water energy,	petroleum products	Thermal power plants, hydroelectric power plants
6	Sixth technological order; Nuclear reactor and computer; period 1930-1970;	Nuclear energy	Radioactive materials, nuclear fuel	Nuclear reactor
7	Seventh technological order; microelectronics; Period 1970-2010;	Solar, wind, water energy; natural gas	Green energy	Wind power generators, solar panels
8	The eighth technological order; Nanotechnology, nanotechnology, IT technologies, Resource-saving technologies, etc.; Period 2010-2040;	natural gas, biofuels; Solar, wind, water energy;	Biofuels, ls, Green energy,	Wind power generators, solar panels; application of intelligent technologies for energy saving

Source: developed by the author

The image of the future branch of the economy (the model of the branch of the economy, the economy of the country's region) has prognostic properties. Such a model is important for managing the process of further development of the industry in ETO.

It is important to develop the military-technical direction of the scientific theory of technological orders due to the great influence of geopolitical risk on the overall process of socio-economic development. Such a direction of the general theory of technological orders can be engaged in research of the processes of development of military equipment and military art as a function of the periodization of technological order. Such a scientific direction in the general theory of technological orders can increase the prognostic capabilities of this theory in geopolitics.

Specialists in the field of military-technical activities are invited to independently synthesize a system model for the development of this sphere. Anyone who wishes to do so is invited to fill out Table No2. Here is an example of filling in Table 2, which is hypothetical and purely demonstrative.

Table 2 System model of military-technical activity as a function of the sequence of technological structures

№ п/п	Properties of technological structures/Number of technological orders, time period, name	The concept of warfare, forms of geopolitics	The main types of military equipment, geopolitical tools	methods of geopolitical competition, the main types of troops,

1	The first technological order, 2000 BC. – IX century AD; Horse traction	Macedonian Phalanx, the art of warfare	Rowing vessels, shields, swords, chariots, war elephants, fortress construction	Infantry, cavalry, rowing Navy
2	Second technological order, IX century - 1770; Windmill, watermill	Infantry combat formations, interaction with cavalry, navy	Sailing ships, shields, swords, chariots, war elephants, fortress construction	Infantry, cavalry, sailing Navy
3	The third technological order, 1770-1830; Textile machines	Infantry combat formations, interaction with cavalry, navy	Sailing ships, cannons, guns, fortress construction	Infantry, cavalry, sailing Navy
4	The fourth technological order, 1830-1880; Steam engine	Infantry combat formations, interaction with cavalry, navy	armored trains, cannons, guns, fortress construction	Infantry, cavalry, steam navy, transportation of troops by rail
5	The fifth technological order, 1880-1930; Electric Motor, Internal Combustion Engine	The concept of tank wedges, the concept of air supremacy	Tanks, guns, planes, construction of fortified areas	Armored troops, aircraft
6	Sixth technological order, 1930-1970; computers, rockets, atomic bomb	The concept of guaranteed destruction of the enemy by a retaliatory nuclear strike	Strategic nuclear missiles, submarines with missiles on board	Rocket troops
7	The seventh technological order, 1970-2010; microelectronics	The concept of guaranteed destruction of the enemy by a retaliatory nuclear strike	Strategic nuclear missiles, cruise missiles flying at low altitude	Electronic warfare equipment, missiles flying at low altitude
8	Eighth technological order, 2010-2040; Nanotechnology, nanotechnology, IT technologies, Resource-saving technologies, etc.	The concept of hybrid warfare, the strategy of "color revolutions", neurogeopolitics and more	Global information systems, geopolitical neuromarketing, hypersonic missiles	Economic power, attractiveness of lifestyle and culture, impact on the creation of society and the individual

Source: developed by the author

The concept of "geopolitical neuromarketing" defines the use of neurotechnologies, neuromarketing methods in the field of management and geopolitics Glushchenko (2021), Glushchenko (2020), Glushchenko (2020).

It is recommended to predict the shape of the future in the form of a model, a table for all spheres of human activity (art, medicine, social relations, world order, etc.). Such tables (predictive models of the future of different spheres of human activity) not only explain the essence of the processes taking place, but are also predictive. To improve the predictive properties of such tables, it is recommended to add a fourth column to them. This fourth predictive column of the table may have the title: "the main directions of scientific and technological progress". The development of such predictive models (tables) will make it possible to more accurately determine, predict the directions and trends in the development of certain industries and/or spheres of human activity, and effectively solve the tasks of developing a new ETO.

The intensification of innovation activity during the ETO period creates the need to change the methodology of management in organizations: firstly, it is recommended that organizations switch to a project model of their functioning; secondly, to improve the efficiency of management, it is better for organizations to switch to a matrix organizational structure.

At the same time, at the beginning of the 21st century in the real economy, the main model of organizations' activity is the process model of organizations' functioning. When investigating this issue, it is necessary to take into account the different understanding of the process model in the management and economic activities of firms. It is necessary to distinguish from each other: the process model of the organization's activity; the process model of the company's management. The process model of organization management is based on the fact that the process of organization management is displayed in the form of a continuous sequence of control actions on the company. The process model of the company's (organization's) activity consists in dividing all the activities of organizations into three types of technologies (core technologies; supporting technologies; auxiliary technologies). This model was proposed by Henri Fayol in the 1920s Glushchenko (2021), Valery (2021). This model of organization activity is suitable for firms that are constantly engaged in routine activities (steel smelting, etc.). For firms that are often engaged in innovation, a project model of their activities is needed.

The process model of the functioning of organizations is the basic one in the modern system of accounting and financial management of organizations. At the same time, one of the key concepts of financial management is the hypothesis of the infinite duration of the organization's activities. In contrast, the project model is based on the time-limited duration of the firm's project.

Within the framework of the project model of the functioning of firms, all types of the firm's activities are divided into the following types: firstly, all the activities of the firm are divided into routine and innovative activities; secondly, all the innovative activities of the firm are presented as a set of innovative projects that this firm carries out in the current period of time. It is this project model of the organization's activity that is considered in works Glushchenko (2021), Valery (2021), Valery (2021). When using the project model of organizations, the hypothesis of the infinite continuation of the organization's activities is not put forward: the duration of the organization's activities is related to the duration of its projects. At the same time, the projects implemented by the company are characterized by a finite period of time for their implementation.

The decision to use the firm's project model of its work must be confirmed at the level of the organizational structure of this company. The choice of projects as a factor in the decomposition of the company's activities, relatively independent organizational processes of the company lead to the need for the transition of this company to a matrix organizational structure. Therefore, we can say that the matrix organizational structure corresponds to the project model of the companies' activities Glushchenko and Glushchenko (2000). The matrix organizational structure of the company is characterized by the possibility of ensuring a balance between the functional and project components of the company's work in the process of work.

At the same time, the matrix organizational structure provides a good process of adaptation of the company to the external environment. The instrument of adaptation of the company to the external environment is the implementation of innovative projects by this company. At the same time, the importance of innovation policy and effective business planning within the framework of the project model of the organization's activities increases.

The beginning of drawing up a business plan for an innovative project can be called the generation of an innovative idea to modernize the work of this organization in the conditions of ETO.

By an innovative idea, we agree to understand an idea that has a certain target orientation and is characterized by potential economic and/or social utility (value). Innovative ideas are characterized by the following features: ideas have an immaterial nature; legal nature; ideas reflect the connection of an idea with the thinking and mentality of a person; ideas are associated with the professional and general culture of an individual; ideas have potential utility (value) for society and/or the economy, and more.

The authors of innovative ideas can be project teams and/or individuals (scientists; inventors; businessmen; engineers and others). The collective authorship of an idea can be, for example, as a result of using the method of brainstorming or collective generation of ideas.

Information sources for generating innovative ideas can be: the results of marketing research of customer needs; information about the essence and usefulness of scientific achievements and ETO technologies; the process of cognition of the properties and technologies of obtaining new materials; assessment of the competitive situation in the market; information about the unmet needs of society and people, and much more.

The following methods of generating ideas for innovative projects in ETO can be considered: morphological analysis; patent analysis; using the analogy method; collective generation of ideas; brainstorming; information from the Internet; theory of solving inventive tasks; the use of conceptual developments and theories; the use of data banks of ideas and more.

The procedure for generating ideas for innovative projects can be preceded by: SWOT analysis; STEP or PEST analysis; analysis of the dynamics of the development of an industry or region; analysis of internal sections of the organization (internal analysis); analysis of the current market situation.

The heuristic act of generating ideas for innovative projects is quite closely related to: mentality, way of thinking and intellectual potential of a person.

The mentality of an employee can be understood as such a set of his characteristics: intellectual potential; the level of abstraction of thinking; the ability to think creatively; cultural values; attitude to the norms of law; desire to work in a team and much more.

A project team can simultaneously be characterized by: similarity of mentalities of team members; professional and emotional diversity of mentalities of team members.

The main indicators for assessing the level of usefulness of an innovative idea can be called: the degree of application in its synthesis of higher scientific achievements; relevance in ETO; finding an idea in the main trend of technological development; the ability to practically implement this idea during the development of ETO, and more.

It should be borne in mind that individual, random innovations may not be effective enough. Only a conceptual approach, a comprehensive modernization of the organization (state, economic sector, region of the country, company) It can ensure the sustainability of development and competitiveness of these types of organizations in the development of ETO.

A conceptual, comprehensive approach to the modernization of products and equipment of companies should be based on the philosophical concept of such modernization. The conceptual approach in innovation activity makes it possible to

synthesize a sequence (chain) of interrelated ideas of innovative projects. This approach to the synthesis of ideas makes it possible to create a synergetic socio-economic effect as a result of the innovative activities of ETO actors.

When implementing innovative projects, it is recommended to take into account that the development of ETO is accompanied by: the creation of new social and professional institutions; the formation of a new organizational culture of project teams. New ETO institutes may have different directions: firstly, they are institutes for the development of new technologies; secondly, they are institutes for the introduction of new technologies into products of previous technological structures Glushchenko (2021), Glushchenko (2021).

Improving the efficiency of innovation can be achieved through the practical use of a conceptual approach within the framework of the theory of technological structures. IT is characterized by the advanced development of such types of technologies: neurotechnologies; resource-saving technologies; nanotechnologies; information technologies; environmentally friendly technologies; intelligent technologies; digitalization technologies; biotechnologies, etc. At the same time, neurotechnologies and information technologies can be practically used to change the mentality, ways of thinking of people Glushchenko (2021), Glushchenko (2020), Glushchenko (2020).

The project concept is the most general systematic view of a new innovative project. Within the framework of this, such a conceptual approach is to strive to maximize the achievements of this technological order in projects. At the same time, the achievements of the new technological order should be used as much as possible to ensure safety and increase the level of comfort of society.

The conceptual approach to the implementation of innovative projects during the ETO period is designed to ensure: competitiveness of regions; sustainable development of regions and industries; development of innovative ETO technologies; comprehensive practical implementation of these technologies in social processes and the real economy. It is an integrated approach to modernization that can become the main direction and method of synthesizing ideas of innovative projects for the period up to 2040.

To implement an integrated approach to modernization, it is recommended to carry out a study of the structure of the technological basis of the state, the region of the state, the branch of the economy, the enterprise.

Let's study the process of solving the problem of forecasting and developing the concept of innovative development of the region of the state for the ETO period. It should begin with an analysis of the structure of the technological basis of the object under study (region, corporation, etc.).

The algorithm of modernization of the company (industry, region, etc.) includes the following actions.

1) Each of the enterprises of the region should be attributed to a certain technological structure.
2) It is necessary to reflect the volume of production of each of the enterprises in kind, revenue, profit, payments to the budget, etc.
3) It is recommended to conduct an audit of the technologies used and assess the possibility and feasibility of introducing new ETO technologies at these already operating enterprises.
4) It is necessary to identify those ETO technologies that can be applied to the largest number of enterprises. The introduction of such technologies should have the highest priority. Such ETO technologies should be introduced into the practice of enterprises in the first place.

5) It is recommended to draw up comprehensive programs for the introduction of new technologies at enterprises of previous technological orders (structures).

Example #1. Using the example of nomadic, livestock, and family farms in permafrost areas, we will consider the possibility of modernizing the economy and life of such a region of the country. Such livestock farms: have a family character; animal breeders live in yurts; these animal breeders move on reindeer sleds. In Russia, permafrost regions occupy 2/3 of the country's territory. These reindeer sleighs belong to the first technological order. The first technological order (way) was called "horse traction". Let's consider the possibility of using ETO technologies for the modernization of reindeer herders' yurts, reindeer sleighs.

1) Nanotechnologies can be applied to increase the strength and wear resistance, thermal insulation properties of individual parts: yurts in which reindeer herders live; reindeer sleighs.
2) Can nanotechnologies and biotechnologies be used for the production of medicines to increase the immunity of livestock breeders and deer themselves?
3) Neurotechnologies can be applied in practice to register the physical condition of both reindeer herders and their reindeer. Such application of neurotechnologies can: reduce the risk of diseases of people during long transitions; prevent overstrain of people and animals; reduce the death of livestock; increase the life expectancy of people and much more.
4) The use of satellites to track the location of reindeer herders' camps and individual reindeer sledges can reduce the risks of reindeer herders' families in difficult meteriological conditions and much more.

The integrated application of new ETO technologies allows us to preserve the ecosystem of the life of the peoples of the North, reduce the risks to life and increase the life expectancy of reindeer herders.

Similarly, you can study the life of nomadic peoples on other continents (Africa, Asia and others). Programs for creating technological ecosystems of nomadic peoples of the North, Africa, and Asia could become international. Such programs can be implemented by the UN.

At the same time, an increase in the scale of such programs will reduce the cost of equipment sets by increasing production volumes (this is the well-known "scale effect of production"). The implementation of such international programs under the auspices of the UN could reduce the gap between the economic and technological standard of living of peoples in various regions of our planet.

Table 3 Comparative analysis of methodology (concepts) of the theory of technological orders, ecosystem approaches and convergent technologies

№ п/п	Innovative project development concepts /Titles properties of the concept	Marketing concept (approach)	Theory of technological orders	The concept of convergent (nature-like) technologies	The concept of an ecosystem approach
1	The satisfied need of society	the need for a product (product and/or service)	Society's need for sustainable scientific and technological progress	Minimizing resource consumption and damage to nature	Improving the comfort of the lifestyle of a certain social group

2	The basis of the methodology	market research methodology	Philosophy and methodology of science	Stochastic, simulation modeling of natural processes	Analysis of the lifestyle of social groups
3	Development product (product or service)	goods and services	Scientific support for the development of ETO (service)	The product is related to resource conservation and the ecology of society	Complex product (goods and services) for one social group
4	Planning horizon	product life cycle	the year 2040	Long-term, global	Strategic, market segment
5	The object of implementation of the innovation project	goods and services	Technological order as a new stage in the development of human civilization	The system of nature conservation and ensuring the environmental interests of society as a whole	Creation of a comprehensive service system for the market segment
6	Attitude to competition	competition with other manufacturers in the market segment	It is out of competition due to a qualitative leap in technological development	Competition at the level of philosophy, national idea, lifestyle and culture of the nation	The goal is to avoid competition by creating pioneer integrated products
7	Key factors of developer competition	competence of the company's personnel	Mentality and organizational culture of development institutions of the ETO	Organizational culture of the entire national innovation system	competence and organizational culture of the company's personnel
8	The impact of the concept on the market	impact on the market segment	Qualitative impact on all markets	The impact of the technological system on the human environment	The impact of the product on the market segment
9	Criteria for evaluating the effectiveness of an innovative project	current profit of the company	Improving the level of safety and comfort of life of the population	The degree of similarity of the technological process to natural processes	The cost of the company

Source: developed by the author

Writing a business plan for an innovative project is an important stage in preparing the implementation of such a project. The author of the business plan of the project is the project team. The specifics of the work and management of project groups are described in work Glushchenko (2020). In the interests of ensuring the effectiveness of an innovative project, its project team should work: independently (independently); scientifically sound; conscientiously; in the interests of ensuring the success of the project; pursues the goal of maximizing the specified efficiency criterion and more.

The criteria for the effectiveness of the project can be the following indicators: the payback period of the project; the net effect of the project; the return-on-investment index and others.

It is possible to improve the quality of innovative project ideas using the following techniques: to develop an algorithm for synthesizing project ideas; to apply a procedure for evaluating the feasibility of a project; to make a preliminary assessment of the effectiveness of the project Valery (2021).

Factors that have an impact on the quality of innovative project ideas can be considered: the innovative mentality of the head and the entire project team; the professional composition and organizational culture of the innovation project team; the technological structure of the subject area (mechanical engineering, computer science, biology, etc.) of the implementation of the innovative project; the hierarchical level of the "technological pyramid" at which a specific innovative project will be implemented; the type of market where the project product will be implemented (manufacturer's market; consumer market); the nature of the innovation (industrial or post-industrial) nature of the innovation project; the product or service as a type of product of the innovation project; the type and nature (functional, structural, parametric) of the company's task to be solved in the innovation project; the object of the innovation project: new technology; new product development; changes in human consciousness and more.

Modeling can be used to increase the reliability and accuracy of business plans for innovative projects. The method of modeling the processes and results of an innovative project can be effective if the following conditions are met: firstly, the model must describe in detail the object of modeling; secondly, the model must be abstract and simplified Valery (2021).

The model of the innovative project was proposed in works V. Glushchenko. and Glushchenko (2015), Glushchenko and Glushchenko (2014). This model describes the structural elements of the innovation project and the external factors of the project. When using this model, it is possible to obtain an estimate of the probability of successful implementation of the elements of an innovative project. An integral assessment of the success of the entire project can be obtained as the product of the probabilities of successful solution of the tasks (elements) of the project (for example, the development of a successful product design). In the described project model, the entire process of implementing an innovative project is divided into two groups of elements (management decisions): solutions that are related to the external problems of the project; solutions that are related to the internal problems of the innovation project. The content of these two types of management decisions, respectively, was described in two tables V. Glushchenko. Glushchenko (2015), Glushchenko and Glushchenko (2014).

This model includes four hierarchical levels. The considered four-level product model is based on the well-known three-level product model proposed by F. Kotler. It is known that F. Kotler identified three levels of goods in his model. The first level of the product describes its main purpose (to satisfy a specific customer need). The second level of the model represents this product in its real performance (defines the main characteristics of the product). The third level of this model describes the product as a "product with reinforcement" (credit, warranty, after-sales service, etc.) Kotler (1990). The fourth level of the model was proposed to describe the strategic and environmental impact of the product on the market and society. This level of the product has been called strategic and environmental V. Glushchenko. Glushchenko (2015), Glushchenko and Glushchenko (2014). This allows you to describe the relationship: the probability of successful implementation of the

project; the technological complexity of the innovation project; the competence of the project team; the financial results of the project.

The results of modeling the results of innovative projects can be used in practice during the writing of the business plan of an innovative project. At the same time, the business plan of the innovation project is used to justify the management decisions made by the managers of the organization aimed at implementing a specific innovation project.

The business plan of an innovative project is characterized by the following functions: description of the conditions for the implementation of an innovative project; assessment of the financial results of an innovative project; determination of the key characteristics of an innovative project; research of the production system of an innovative project; determination of qualification and professional requirements for the team (staff) of an innovative project; search for investment sources and development of an investment schedule for an innovative project; study of the risks of an innovative project; analysis of ways to reduce the risks of an innovative project; forecasting the financial results of an innovative project and others.

Therefore, the business plan of an innovative project can perform the following roles: assessment of the degree of readiness of the project team for the implementation of this project; determination of the types and volumes of necessary resources; risk reduction in the implementation of an innovative project; forecasting the results of an innovative project.

The methodology for drawing up the business plan of the project was approved by UNIDO. This methodology determines the form and content of the business plan of an innovative project.

The financial results of an innovative project can characterize such indicators as: NPV - the net reduced effect of the innovative project; PI - the index of return on investment in the project; PP -the payback period of the project and others. Estimates of these financial indicators of an innovative project can be calculated taking into account the risks of the project according to the formulas given in works V. Glushchenko. Glushchenko (2015), Glushchenko and Glushchenko (2014), Valery (2021).

3. DISCUSSION

Search forecasting is an effective tool for optimizing the goals of modernization of the technological base of industries and regions of the country during the ETO period. Normative forecasting makes it possible to optimize methods and tools for the modernization of economic sectors and regions during the development of ETO. The results of all types of forecasting make it possible to make more effective management decisions in the process of becoming an ETO. The development of industry-specific and regional ETO models makes it possible to simultaneously increase the efficiency and reduce the risks of ETO development management processes. Due attention should be paid to the systematic forecasting of the future appearance of economic sectors and regions of the country. The ETO development process should be analyzed and adjusted in a timely manner. At the same time, it can be expected that there will be a transition of organizations operating in the field of innovation to the use of a project model of firms' activities.

When developing ETO, it is necessary to observe the principle of advanced scientific support of real processes. Compliance with this principle will reduce the investment risks of creating regional and corporate ecosystems.

To increase the level of scientific support for the formation of ETO, it can be recommended to create departments of system engineering, neurotechnologies, ecosystems, environmentally friendly technologies, nature-like (convergent) technologies in industry and regional universities.

Important factors in the development of ETO are: competence, mentality, organizational culture of the personnel of organizations and / or members of the project team (group). In order to ensure the effective work of the project team, it is necessary to create: a favorable moral atmosphere in the team; system analysis of development processes; forecasting of ETO development processes; stimulate the creativity of employees; develop an innovative organizational culture of personnel, members of the project team (group). At the same time, the organizational culture of the project team should: increase the effectiveness of interaction in the team; to contribute to the collective generation of ideas by this team; to increase the effectiveness of communication, the exchange of implicit knowledge in the process of project implementation. The competence of the project team members greatly affects the likelihood of successful implementation of an innovative project. In the motivation systems of project team members, it is recommended to use an effective approach to assessing the competence of team members based on the results of their innovative projects Glushchenko and Glushchenko (2016).

During the development of plans and implementation of innovative projects, it is proposed to take into account that the project team gradually increases the amount of useful information about the object that is being developed in a specific innovative project. This amount of information, in particular, is determined by the stage of implementation of a certain project, the stage of the product development cycle, the stage of the project life cycle. When implementing innovative projects, it is recommended to take into account that the degree of risk in innovative projects is higher than in the routine activities of firms.

The materials of this article indicate that it is very useful to predict the processes of modernization of economic sectors and regions of the country. Additionally, this article confirms that the introduction of system modeling of the development of economic sectors and regions of the country can improve the effectiveness of the management of the processes of formation and development of ETO. In turn, the development of ETO affects: scientific and technological progress of economic sectors; innovative and social development of the country's regions; all spheres of human life and activity, including the development of neurogeopolitics, neuromarketing and others.

Leadership qualities of managers of these subjects of the innovation process can be of great importance in the success of modernization programs of industries and regions of the country. For example, the newly elected mayor of New York announced in the media (early November 2021) that he would receive his first three salaries as mayor in bitcoins. The media claims that by making this statement he is trying to emphasize that the new mayor of this city will help make his city the most favorable for innovation.

Such a statement can also be considered from the point of view of the use of neurotechnologies in politics. Since neurotechnologies belong to ETO, this may indicate that new technologies are penetrating into more and more new spheres of society. You can read more about the use of neurotechnologies in politics in Glushchenko (2021), Glushchenko (2020), Glushchenko (2020).

4. CONCLUSION

The article forms a methodology for forecasting and analyzing the processes of modernization of economic sectors and regions of the country during the formation of ETO. For such forecasting of modernization processes, the construction of system models of economic sectors and regions of the country was used. The article presents a comparative analysis of four concepts of development in the eighth technological mode: marketing theory; theory of technological modes; the concept of convergent (nature-like) technologies; the concept of ecosystem approach. Based on system models of various fields of activity (fuel and energy complex, military-technical activities, etc.), the global and complex impact of ETO development on society and the economy has been confirmed. This article provides arguments in favor of the fact that due to the increasing intensity of innovation; it is possible to predict the transition of enterprises to a project model of their functioning during the ETO period. At the same time, it is possible to predict a further increase in the importance of business planning in the implementation of innovative projects. The article offers a conceptual approach to generating business plan ideas for innovative projects during the development of ETO. The article describes the features of the process of forming and modeling business plans for innovative projects. The results of this article can be practically useful in such cases: forecasting the processes of modernization of economic sectors and regions of the country during the development of ETO; transition of companies to the project model of their activities; practical implementation of innovative projects taking into account the specifics of the processes of formation of ETO in the economy and society, and much more.

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