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Article



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FEATURES OF THE FORMATION OF A NEW ECONOMY AS A CONCEPTUAL, KNOWLEDGE-BASED ECONOMY FOR THE EFFECTIVE MANAGEMENT OF THE REGIONS OF THE RUSSIAN FEDERATION

Abstract: In the article the authors consider the issues of ensuring the competitiveness of economic systems in the new economy. A conceptual model is presented and the characteristics of the structural elements of the knowledge economy are given. The methodological foundations of the formation of competitive advantages within the framework of the synergetic approach are determined. The problems of transformation and adaptation of Russian regions to modern trends in world economic dynamics are revealed. Improving the innovative mechanism for the development of regional economies, determining the directions for enhancing the innovative activities of the regions of Russia on the principles of "smart specialization".

Key words: competitiveness, new economy, paradigm of the regions of the Russian Federation, synergetic approach, current trends, smart specialization, conceptual model, transformation of economic systems, methodological analysis, development of the regional economy, innovation mechanism.

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Introduction

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Competitiveness has been one of the main topics of the world economic literature of recent years.

Against the background of the openness of national economies and the ensuing globalization, there is practically not a single state that would not proclaim increasing competitiveness as one of the main tasks of its socio-economic policy and would not look for ways to strengthen it. The growing interest in it is largely due to the formation of a new economy, an economy based on knowledge, as a specific-historical form of development, characterized by a structural shift towards increasing the share and role of knowledge-intensive and creative industries in the reproductive potential of a country/region, in which the ability to generate and use "knowledge", to be ahead of competitors in the interdisciplinary search for innovative solutions and breakthrough technologies is of key importance.

It should be noted that the intensification of innovation activity is traditionally one of the fundamental conditions for the formation of competitive advantages of almost all economic systems and that "knowledge" is a necessary element of the development of social production at all historical stages of its evolution. However, only in the conditions of a radical reduction in the role of physical and routine mental labor, mass informatization and intellectualization of social life, "knowledge" was able to move to the place of the main factor (the main driving force) of production, which is characteristic of the modern (innovative type) of social development.

The process of formation of a new economy is determined by the fact that the post-industrial economy, which was initially based on the prevalence of the service sector and transnational outsourcing of industrial production, as a result of the rapid development of information and -communication technologies, has been replaced, and evolutionarily, by the model of the information (network) economy. In turn, the widespread use of IT technologies has led to their integration in the form of the infrastructure basis of the new technological order.

Main part

The current stage of development of the world economy and the Russian economy is characterized by the increasing intellectualization of all types of activities, the factors used that have a direct impact on the rate of economic growth. The level of development of theoretical and applied science, science-intensive industries, the technology market, and creative competencies of a person today create the basis for the formation of a new concept of social- and applied science. Economic development, in which knowledge increasingly manifests itself as a direct productive force, acting simultaneously as an

economic resource (a factor of production) and as a product (a source of growth).

The knowledge economy, being a specific-historical form of manifestation of the evolution of post-industrial society, starting from the second half-of the XX century, has become the basic concept of the development of the modern economy of an innovative type. The transition to a qualitatively new stage of development (change of the social paradigm) is associated with a shift in emphasis from capital as the most important factor of production to a person as a carrier of knowledge anthropocentric approach, which simultaneously takes into account the economic interests of the individual and society. Within the framework of this reproduction model, the ability to generate and use knowledge, moreover, ordered, consolidated into a certain system, becomes a key condition for the dynamization of economic growth and ensuring the competitiveness of almost all economic systems. For example, in a significant part of developed countries (according to various estimates, from 65 to 98%), competitive advantages are achieved through knowledge, competencies, and creative decision-making. In this context, from the point of view of increasing the competitiveness of socio-economic-systems in the context of the formation of the knowledge economy, strategic priorities should be measures aimed at creating conditions for the development and implementation of an innovative development model, which provides for the possibility of synchronizing the processes of creating new productive forces and production relations, as well as achieving a consensus of the interests of society, the state, business and a specific person. The very concept of the new economy was clearly formulated by the end of the 20th-century and today it is one of the youngest and most popular scientific theories. J. Schumpeter brought to the fore the most important categories of "innovation", "innovation", "entrepreneurship", which play an equally important role in his theory. than the price, free competition. I. Schumpeter considered innovation as a means of profit for an-entrepreneur-innovator. At the same time, in his opinion, a dynamic (active, active) entrepreneur (people who conceive and implement innovations) invents new combinations of production factors, which are a source of entrepreneurial profit.

- creation of a new product;
- the use of new production technology;
- the use of a new organization of production;
- opening of new markets;
- discovery of new sources and types of resources.

Thus, Schumpeter considers the-entrepreneur-innovator to be the driving force of economic progress. "Competition drives the innovative aspirations of the entrepreneur (competition of new

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products, new forms of organization, etc.). In order to survive in a competitive environment, you need a monopoly, a monopoly position in the market of the organizer of innovations. Views on the phenomenon of the new economy are constantly evolving. In 1945, F.A. von Hayek was the first to propose to analyze the impact of new knowledge on economic and production processes, based on the works of F.A. von Hayek, and in 1957 he developed the first classification of new knowledge. However, the founder of the knowledge economy as a discipline is considered to be F. Machlup. Thus, F. Machlup defined the knowledge economy as follows: "One of the sectors of the national economy in which the production,- processing and management of knowledge takes place." Moreover, he estimated that in 1958 the sector of the knowledge economy contributed about 29% to the US GNP. In this sector, F. Machlup included numerous types of human activity, which he combined into five groups:

1. Education (44.1%)
2. Research and development (8.1%)
3. Mass media (television, telephone, etc.) (28,1%)
4. Information technology (6.5%)
5. Information Services (13.2%)

F. Machlup bases his theoretical views on the inclusion of certain industries in the sector of the knowledge economy on the following propositions: knowledge production is the - process by which someone-learns something that -is previously unknown to him, even if it is already known to others. In accordance with his concept, both the doctor participates in the "production and dissemination of knowledge" when he writes a prescription, and the lawyer, the basics of the formation of the knowledge economy are schematically presented in Figure 1.

Since the 1990s-, the concept of EZ has been considered as the main element of state policy in the implementation of cross-country comparisons. In developing national strategies for individual countries, the Organization for Economic Cooperation and Development (OECD/OECD) proposed the following definition of this term: "The knowledge economy is an economy that encourages its organizations and people to acquire, create, disseminate and use codified and tacit knowledge in order to accelerate the development of knowledge economic and social development".

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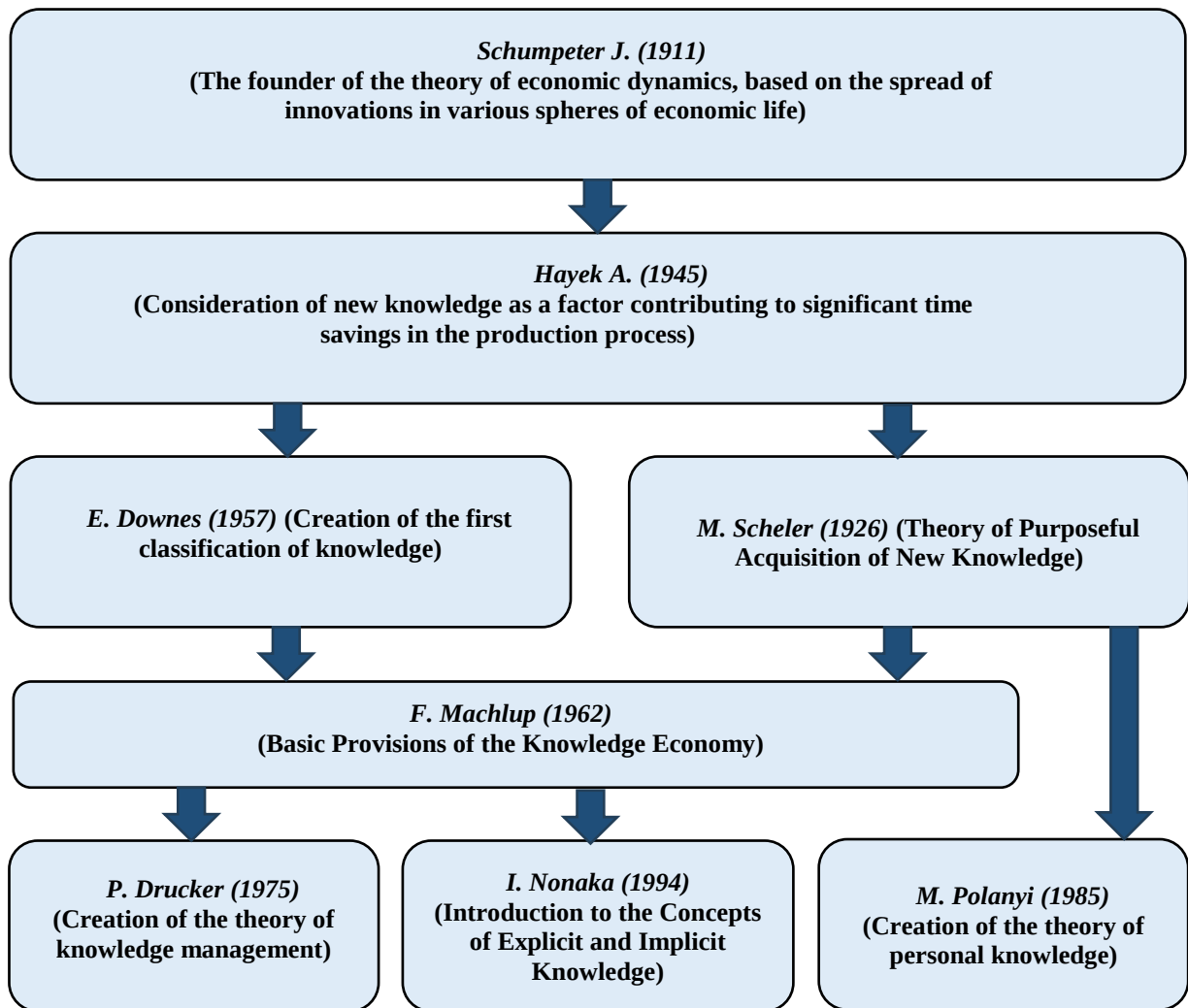


Figure 1. Fundamentals of the formation of the knowledge economy

The formation of the concept of the new economy can be traced by the evolution of interpretations of the EZ, a number of which will be given below. According to UN experts, it is "a combination of intensive technological progress in the field of computers, communications, internationalization of economic systems, and rapid changes in the financial sector."

According to B. Gaudin, the knowledge economy is an "umbrella" concept that allows you to collect existing ideas and concepts in the field of science and innovation, as well as the corresponding indicators into one conceptual system. Such an approach is quite problematic from the point of view of scientific rigor, but it is quite fruitful from the pragmatic point of view, since it activates a huge field of activity for the publication of new articles and the organization of discussions, as well as drawing the attention of politicians to new trends. D. Bell presents his point of view on the new economy, defining it as a world in which communication technologies form global competition. As the basis of all changes, he

takes the rapid and inevitable development of the Internet, which is becoming the main means of communication and information processing. In his opinion, business chooses the World Wide Web as its organizational form. As a result, capital and labor (key components of any business-process) undergo certain changes. He writes: "Of course, the laws of the market economy continue to apply in this network economy, but in a special way, the understanding of which becomes extremely important for us to be able to live, develop and prosper normally in this brave new economic world."

As the main directions in which social life will change, M. Castells singles out:

1. Transformation of the practical activity of the company towards the creation of a network enterprise as a set of specific business-projects that are implemented through networks of various composition and origin. A network is not an organizational unit, it is a type of entrepreneurial activity.

2. Changing the relationship between the Internet and capital markets. As information

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technologies become more powerful and flexible and national laws become increasingly subordinated to capital flows and e-commerce, financial markets are integrating into a single real-time structure that spans the globe. An example is the financing of new global projects by venture capital.

3. Changing the role of work and flexible employment practices in the networked business-model. Talented people are becoming the main driver of production in e-business - : a self-programming, self-reliant workforce.

4. Specificity of innovation in the electronic economy in the context of increasing labor productivity.

Later, a team of authors from different countries, developing this topic, *identified three laws of dynamics, namely:*

- the first is based on knowledge,
- the second is based on innovation,
- the third is based on joint advantages.

V.M. Sergiev singles out such special characteristics of the new economy as: the economy is associated with extremely complex and incomprehensible processes of regulation of intellectual property rights, on the one hand, and on the other hand, it is education. The author also emphasizes the importance of fundamental science. It is fundamental science, being a colossal resource of interaction of mankind as a whole with the environment, that is able to change the world in a very short time. "Fundamental science, determining the picture of the world, directly affects the political- process." However, "the formation- of a scientific and technical complex, in contrast to the production complex, is an economically unaffordable

thing for the newly industrialized countries. The Japanese managed to do this only because Japan at the time when it took up this in- the 1950s, had an exceptionally low level of wages." Some countries began to specialize in the export of education (Australia, the Netherlands, etc.). According to V.M. Sergiev, Russia's position in the emerging knowledge economy was shaken by the-"policy of national betrayal", when in the 90s-The unique scientific complex was "destroyed" and it could be restored, including by realizing "colossal opportunities for the export of education." Another name for the new economy is the corporate knowledge economy, which should be understood as the combined intelligence, qualifications and ingenuity of employees, the most modern tools, freedom of creativity and business, instant response to emerging trends and a culture of continuous improvement. According to N.I. Bazylev, all this should be aimed at creating something-truly special; something that delights customers. Such definitions of EZ as those given by V.A. Medvedev, who believes that the knowledge economy is an economy based on the intensive and effective use of knowledge, also deserve attention.

G. Malinetsky interprets EZ as a certain state of the economy of a given country, in which:

- a) knowledge becomes a full-fledged commodity;
- b) any product carries unique knowledge;
- c) knowledge becomes one of the main factors of production."

The main characteristics of the new economy, formulated in the works, are given in Table 1.

Table 1. Characteristics of the new economy

Main features	Description
Distinctive features	Networked, Global
Raw materials	Information (not disappears, is not alienable)
Infrastructure	Internet
Financial institutions	Venture funds, securities markets of high-tech companies
Credit sources	Pension funds, corporations, investors, households
Institutes	Intellectual property, dynamic competition, low barriers to entry

N.V. Beketov proposes to study the concept of "new economy" in two aspects: narrow and broad. In the narrow sense, the new economy - is the information sector of the entire economy, which includes the stock market, e-commerce, finance, the media and a number of other areas, such as education, health care, communications, etc. - technological development, the onset of its next, post-industrial stage, leading to the

creation of an information society. The basis of such an economy is high-tech companies and industries based on the information capabilities of global telecommunications, and science with all its infrastructure that allows you to turn ideas into concrete achievements is of decisive importance. A.V. Kataev uses the term "creative economy" to describe this phenomenon. In his opinion, such an economy is based on the creative approach of the decision-maker,

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his ability to analyze incomparably large flows of information, the formation of his own ideas about the development of knowledge in a particular field of activity. The key factor of such an economy is a person, who is characterized by a focus on the constant search for new information and the desire for knowledge, which brings to the fore the needs of self-expression and self-realization. "It is not the strongest or the smartest who survives, but the most receptive to change," so our goal is to learn this. N.I. Bazylev and N.L. Gribanova distinguish four approaches to the definition of the concept of "new economy" or "knowledge economy", namely:

In the first approach, the new economy is understood as a complex of knowledge-intensive industries engaged in the production and maintenance of information- and communication equipment, the creation and distribution of software products, the development of communication networks, as well as the entire system of formation, storage and receipt of information, largely built on the Internet. That is, the "new economy" includes all entrepreneurial activity that uses modern electronic information and communication technologies.

The second approach includes in the concept of the "new economy" organizational and institutional innovations in the activities of various (including traditional) sectors of the economy of a number of developed countries. According to it, the American economy of the last decade of the twentieth century is generally characterized as a "new economy" due to the extraordinary increase in its indicators. This was the result of a combined effect of the interaction of advances in technology, business practices and economic policy.

The third approach focuses on the financial component of the "new economy" and defines it as one of the peaks of the international financial economy - of the financial model of management, which widely uses the tools of information-and

technological innovations in the monetary-and financial system.

The fourth approach considers the "new economy" as a set of industries characterized by a more significant share of human capital compared to material elements.

In these industries, the technological realization of knowledge plays a decisive role, and the production of knowledge is a source of economic growth. In this interpretation, the "new economy" includes the sphere of education, information-and communication markets, the production of innovations, the provision of intellectual services (consulting, information intermediation, analytics, marketing). new economic and social structure of society. For example, as R. Buckman writes: "The era of knowledge-oriented companies has begun. And in this situation, the one who has managed to concentrate unformalized intellectual experience within the framework of his organization and has figured out how to transfer it from one employee to another is ahead." D. Amidon writes in this regard: "At present, hundreds of conferences are being held on aspects of the knowledge-based economy in all corners of the globe. What began in 1987 as an initiative to harness the nation's intellectual capital has evolved into a global agenda for international cooperation. Knowledge management technology is universal and can be used in small, medium and large enterprises."

According to D. Kovalev, in a developed society, the generation of knowledge becomes the main source of productivity and growth of well-being, replacing traditional sources (land, labor and capital), and developed countries tend to compete in the field of research and development of innovative ideas, rather than the production of goods. The systematization of the approaches existing in the specialized literature to the interpretation of the "knowledge economy"- is presented in Table 2.

Table 2. Systematization of approaches to the definition of the concept "Knowledge Economy"

Hike	Characteristics
Collective	The "knowledge economy" is identified with industries that produce computer and communication equipment, software, the entire system of production, storage, processing, and distribution of information
Integration	"knowledge economy" means "long-term sustainable crisis-free development under the influence of information technologies, integration into the world economy",
Globalization	The "knowledge economy" refers to "the current processes of globalization and world integration, which, on the one hand, change the conditions for the functioning of each national economy, and on the other hand, - require new approaches to the choice of national economic policy and policy coordination between countries"

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Network	The "knowledge economy" means, first of all, the Internet space, its mechanisms and opportunities for doing business, the entire infrastructure that ensures its existence and development, as well as other segments of the telecommunications sector
Information	The basis of the "economy" is knowledge and/or information, in the development of which the contribution of human, intangible capital prevails in comparison with material elements
Industry (sectoral)	"knowledge economy" is understood as a set of industries (segments, sectors) united by some-criterion
Innovative	"knowledge economy" is understood as an innovative economy, That is, an economy based on a new technological order
Comprehensive	The "knowledge economy" is considered as a set of such components as information-and communication technologies, financial economics, international division of labor, etc.

Summarizing the above, it should be noted that the fundamental novelty of the concept of the new economy lies in the fact that:

- knowledge can be separated from economic activity and considered as a separate product and resource;
- theoretical knowledge underlying any applied developments is essential;
- knowledge in EZ acts as a product of activity, an object of final consumption, a production resource, a means of transactions, a means of accumulation, as well as a means of consolidating society and reproducing social institutions;
- if in the conditions of the traditional economy the law of diminishing utility applies, then in the EZ knowledge does not experience oversaturation, and, rather, the law of increasing utility applies, since the greater the scale of activity, the greater the efficiency of the use of additional resources involved;
- the law of knowledge reconfiguration is in force, the essence of which is the constant need for the transition of knowledge from one form to another (for example, tacit knowledge can turn into explicit knowledge; individual knowledge can turn into group or organizational knowledge, etc.);
- The condition for the existence of EZ is the ability to disseminate large amounts of information with low costs for the economy;
- discriminatory prices are becoming widespread;
- EZ cannot be reduced to one sector or industry, the effect on the economy is possible if it is adopted by all industries and regions;
- the key role in the EZ is assigned to employees who have a high level of competence as carriers of a special type of knowledge;

- the importance of the role of research and innovation, which are the structural characteristics of the new economy.

Thus, the knowledge economy is a new stage in the development of modern society, in which the dynamics and quality of economic growth are increasingly dependent on technological shifts based on innovations, which is manifested in an increase in the role and outstripping rates of development of high-tech industries, an increase in the science intensity of production, an increase in the innovative activity of economic entities, and the acceleration of scientific-technological development, shortening the life cycle of products, research, development and innovation.

Next, we will consider the characteristics of the EZ, which will allow us to identify and separate it from the pre-industrial, industrial economy.

For example, focusing on the specifics of EZ, E. Pilipenko introduces the criterion "geometric size of the substance of nature" involved in the production of an economic product in a two-level model of social production.

In the author's reproduction model (as a process of active transformation of natural resources by people in order to create the necessary material conditions for their existence), the factors participating in the production process are divided into two main groups: "Knowledge" and "Substance of nature". At the same time, the authors, considering the correlation of technological modes (TS) with the stages of economic development, substantiate the possibility and expediency (from-for the features of technological processing (nanotechnology) of natural resources, partially in the fifth and sixth TS replacing the traditional for-1-4 TS reproduction model "Man - Natural Resources" with the model "Knowledge - Matter of Nature" (Table 3).

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Table 3. Evolution of the structure of the economic product

Geometric Dimension substances of nature involved in the production of the product	Structure of economic product, by factors, %		Correlation with:	
	The substance of nature	Knowledge	technological mode (TU)	stage of economic development
Macro level (1 mm or more)	75 (100–75)	25 (0–25)	1, 2 TU	Pre-industrial economy
Meso-level (Tens of μm – 1mm)	50 (75–50)	50 (25–50)	3, 4 TU	Industrial Economy
Micro Level (1 μm – tens of μm)	25 (50–25)	75 (50–75)	5 TU	Post-industrial economy
Nanoscale (1 nm – 1 μm)	5 (25–5)	95 (75–100)	6 TU	Knowledge economy

According to the author, with a change in the size of the Substance of Nature used in the production of economic products, the socio-economic-system (SES) is also transformed. Moreover, the more significant the changes in the geometric size of the Substance of Nature, the more significantly the SES changes. Thus, "with changes occurring within the size range (column 1, Table 3), the evolution of the economic system occurs, with the transition from one range to another – a revolution that requires a breakdown old and the creation of completely new socio-economic-conditions, institutions and tools."

Since bio- and nano technologies do not arise from metal and- mechanical engineering technologies, but completely replace them, adequate changes are required in the economic systems that ensure their implementation. Consequently, the economy, as a sphere of social activity, is responsible for the organization of the system of social relations necessary for the processing of the "Substance of Nature" at a level technically and technologically accessible to society. as a result of the effective use of knowledge at the disposal of society and man. Based on this thesis, the author defines the knowledge economy as not "an economy that produces knowledge", but as "an economy that produces products that mainly (more than 3/4) consist of knowledge". A knowledge economy emerges where and when society moves to produce products that consist of less than one-quarter of the natural "Stuff of Nature." In other words, the knowledge economy arises where and when society switches to technologies for processing "Matter of Nature" at the nanoscale.

At the same time, it should be noted that nano-industrialization - is not the only possible form, but only one of the priority directions of economic

development. That is, it is expedient to talk both about the dynamics in the development of progressive forms of productive forces and about changes in production relations. mass informatization and intellectualization of social life, which is becoming characteristic of the current stage of development of -the socio-economic system of mankind.

Thus, the process of formation of a knowledge-based economy is determined by the fact that the post-industrial economy, which was initially based on the prevalence of the service sector and transnational outsourcing of industrial production, as a result of the rapid development of information and -communication technologies (ITC), has been replaced by the model of the information (network) economy. In turn, the widespread use of ICT has led to their integration in the form of an infrastructure basis of the new technical specifications, thereby determining the key importance of intelligence and creative competencies (human capital) and the transition to a new economy based mainly on knowledge-intensive activities (innovative, intellectual economy). But it is the Internet technologies that have created a fundamentally new technological environment that ensures the flexibility and transformation of intellectual property, the expansion of the sphere of creative labor, the priority of intangible assets, the possibility of continuous learning, the strengthening of the status and role of science, the consolidation of the key positions of high-tech business and the knowledge-intensive sector.

Thus, when studying the problems of the formation of the EZ, the development of the economic basis seems to be insufficient, the emphasis on the social (institutional) aspect of its formation is important, since knowledge is highly related to human activity. As a social phenomenon, "knowledge" arises

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only in the presence of a developed institutional environment. In other words, special attention should be paid to the study of EZ from the point of view of changes not only in the technological basis of the economic system, but also in the internal laws and main features of EZ as a new method of management. It is the totality of economic relations regarding the most efficient production, distribution and use of available intellectual resources in order to increase the economic potential of the country, ensuring the economic growth necessary to increase social and personal well-being, that constitutes the essential basis of the EZ.

In the context of the above, EZ is presented as a specific historical form of development of the post-

industrial economy, which is expressed in a structural shift towards an increase in the share and role of science-intensive and creative industries in the reproduction process. The new economy is characterized by the humanization of labor, implemented through the mechanization of most routine operations, the development of horizontal methods of organizing the production process and managing it, and the creation of more comfortable working conditions for the activity.

Table 4 presents the main characteristics of different types of economies, including limiting factors of production, the basis of production activity, as well as the object of management and prevailing technologies.

Table 4. Main characteristics of different types of economies

Types of Economy	Limiting factor	Basis	Object of control	Technology
Pre-industrial (agrarian) Economy	Land, labor	T – T (natural) exchange)	Human Management	manual physical labor
Industrial Economy	Capital	Production of goods L – T – M*	Resource management	Insourcing (use of internal resources)
Post-industrial economy	Entrepreneurship	Production of services D – D – D *	Relationship Management	Outsourcing (transfer of functions)
Information (Network) Economy	Information	networks, information services, replication information	Information Management	Crowdsourcing
Knowledge economy	Knowledge	D-education competence- - i n n o v a t i o n -D*	Knowledge (innovation) management	recruiting, outstaffing (involvement of a specialist) Training

In the conditions of EZ as a new type of management, the limiting factor of development is "knowledge", the reproduction basis is the ratio "Money – Education – Competencies – Money". At the same time, the object of management (knowledge/innovation management) is associated with the search and attraction of highly qualified personnel as the main generator of ideas and the source of the formation of intellectual capital, which we consider as the most important factor of production in the economic economy.

The analysis of knowledge as a factor of production and the most important resource of EZ involves the study of such a category as intellectual

(cognitive) rent. Indeed, the true role and significance of fundamental and applied knowledge in the reproduction process can be determined by considering rent relations in EZ. Individual human abilities for scientific activity, the ability not only to perceive previously accumulated knowledge, but also to create new ones in the form of scientific ideas, information technologies, intangible services and products are the basis of intellectual rent. At the same time, rental income can be formed at each stage of the reproduction of a high-tech product (generation, exchange, distribution, application in various sectors of the economy) and each participant in this process is a recipient of the corresponding type of rental income (Figure 2).

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Thus, according to the theory of rent, developed in the direction of studying the impact of both technological and intellectual capital on the economy, the excess profit received from the activities of economic agents (firms, corporations) that have carried out an effective basic or improving innovation

Figure 3 presents the features of the knowledge economy as a systemic phenomenon associated with:

- the innovative nature of economic development, its globalization;
- a breakthrough in the field of information and other new technologies;

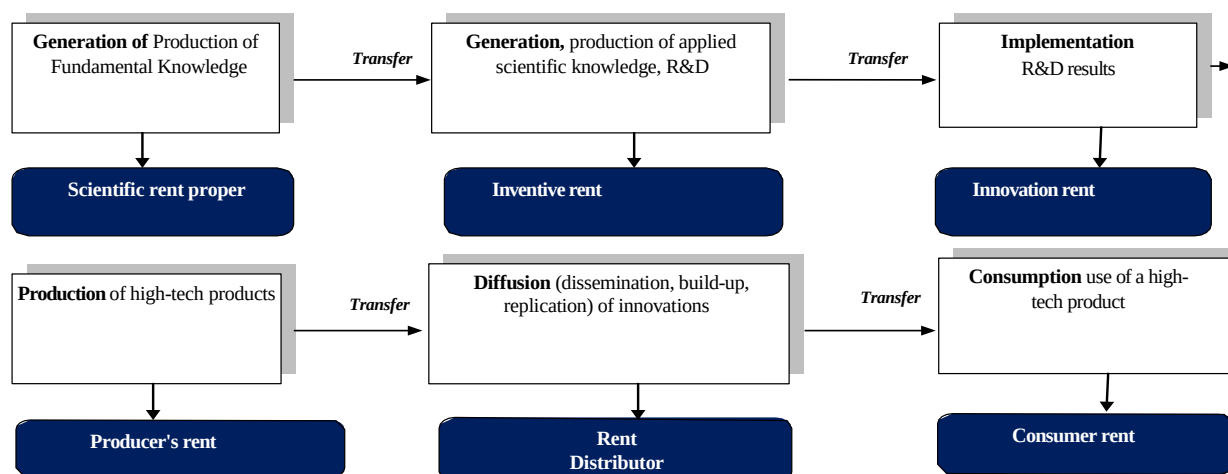


Figure 2. Rental income received in the process of reproduction of scientific knowledge (intellectual capital)

in relation to other firms can be called *differential technological rent*. Excess profits from the effective use of advanced technologies in comparison with competitors with the corresponding labor organization (for example, the innovative business-cycle) can be defined as *technological rent II*, which makes it possible to count on obtaining monopoly profits. Let us draw some analogies, for example, the positioning of an economic actor in markets in which highly professional qualified personnel are in demand, capable of using is a source of *intellectual rent* of the first type. The preferential implementation of the system (strategy) of continuous training and retraining of highly qualified personnel of the organization within the framework of the implementation of *the innovation cycle* leads to the receipt of intellectual (cognitive) rent II.

In general, intellectual rent (excess profit) serves as a key incentive for increasing innovative activity in the new economy. Effective interaction of participants in the intellectual property market (the state, foreign- innovators, investors, owners of innovatively- active firms/enterprises) is possible as a result of the formation of conditions ensuring their coordination. The specificity of EZ, associated with the fact that "knowledge" in it simultaneously acts as a factor of production (resource), a product of scientific labor, an element of infrastructure and the ability of human intellect, has necessitated a holistic approach to its study based on the axiomatics of the system paradigm.

- the formation of an institutional (including value, moral, -ethical, socio-ecological) - basis of the knowledge economy;
- the emergence of cognitive management as a set of new technologies for managing human capital;
- a new procedure for interaction between

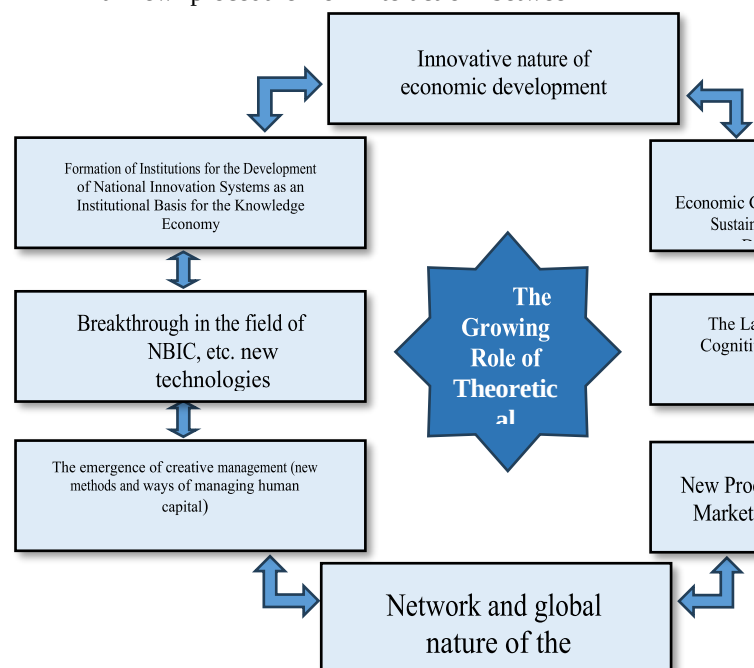


Figure 3. Features of the knowledge economy as a systemic phenomenon

market participants

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exchange, when the consumer of knowledge participates in its creation;

- humanization of economic growth (transition to a stable noospheric type of development, ensuring the purposeful restoration and preservation of biogeocenoses, as a way of management based on exclusively reproducible factors).

The identified features of EZ are characteristics, the significance and degree of expression of which are currently steadily increasing.

For example, analyzing the problems of humanization of economic growth, it should be noted that as a result of the unprecedented aggravation of global environmental contradictions, without taking into account the environmental imperatives of development, rationalization of natural resource management, it will not be possible to prevent irreversible anthropogenic changes in the environment. The determining factor of the new quality of economic growth and social-economic development should be not only the expanded reproduction of intellectual capital, but also the harmonization of the mutual influence of man and nature on this basis. In - fact, the axiom of the unity of Nature and Society goes back to the thinkers of the ancient world. Since then, scientists have been giving their arguments about the place of man in eternal and infinite nature, expressing hypotheses, and offering various scenarios for predicting the prospects for the further development of society in modern literature.

One of the variants of the relationship between Man and Nature is presented in the concept of the noosphere, formulated in the early 20s-of the twentieth century by V. I. Vernadsky. According to Vernadsky, the noosphere is a single process of co-evolution (joint evolution) of living matter and the biosphere on a geological, socio-historical- and cosmic spatial-temporal-scale, controlled scientifically -by the organized activity of mankind. He points to the exceptional importance of preserving the biospheric balance, asserting that it was thanks to the biosphere that rational human activity arose. Today, human economic activity is becoming a powerful geological factor influencing the process of biosphere formation. The exponential growth of scientific knowledge, information, the ecologization of natural resource management, the intellectualization of production activities, the acquisition of the latest technologies, including data on the evolution of the brain in the course of anthropogenesis, are today as real prerequisites for the formation of the noosphere as a result of the formation of the knowledge economy. The creation of a holistic realistic picture of megasystems (biosphere, noosphere) is possible as a result of possession of a wide base of natural science knowledge, the use of innovative interdisciplinary, transdisciplinary methodological approaches.

The ideas of harmonizing the interaction between Nature and Society, rational nature management are developed by N.N. Moiseev. The author argues that the principle of homeostasis or reasonable behavior of Man in the natural environment on the basis of scientific knowledge and compliance with the laws of nature -should be laid in the basis of harmonization of relations between nature and society people." Man can write his own laws, but not the laws of Nature. He can only know them and follow them. The inconsistency of these laws will always lead to sad consequences in the long run.

At present, the biosphere, experiencing superloads of anthropogenic nature, is becoming less and less stable mega-system. And the greater responsibility falls on Man, since his technogenic activity continues to inevitably accelerate the processes of degradation of ecosystems, contributing to the increased imbalance of the biosphere. For example, all over the world today, an average of 120 square kilometers of the earth's surface is concreted/asphalted during one week, a reduction in the earth's biomass by a third is observed, while the biological diversity of flora and fauna is relatively stable.

Only the formation of a noosphere-oriented-worldview, the creation of a new ethical-and ecological approach to the study of the patterns of interaction between nature and society is an objectively necessary process for the formation of an economy based on knowledge. Noospheric thinking contributes to the optimization of the process of integration of objective ideas about nature, understanding the dynamics of social processes, the study of man and the features of high-tech knowledge production in the socio-cultural evolution. An important stage in the comprehension of the noospheric reality is the formation of a fundamentally new socio-natural- attitude of man to the environment as a value, a rare economic good.

The prospects for the socio-economic-development of modern society are directly related to the potential of Man to reduce, and subsequently to overcome the increased gap between his subjective economic mind, ever-increasing needs and the objective harmony of natural dynamics. Man must not only preserve the biosphere in all its diversity, but also ensure the spiritual growth of mankind, the humanization of interpersonal and interethnic relations, the preservation and development of the cultural and-ethnic diversity of the world.

Summing up the above, it should be noted that the EZ is considered as an economy that uses knowledge to accelerate its own growth and increase competitiveness (World Bank specialists), and the transition to the knowledge economy itself is perceived as an economic revolution or as a transition to a qualitatively new economy, including one that

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does not function according to the rules of classical macroeconomic theory.

The disciplinary ontology of EZ is at the stage of development and comprehension. There are many debatable points, since the development of the knowledge economy creates unprecedented difficulties both in society and in business.

For the first time in history, a situation has arisen when any changes in the economy, culture and politics in each specific society begin to be considered in a global context. On the one hand, this leads to an increase in local instability, and on the other hand, to the accelerated development of humanity as a whole, since it is instability that leads to a new level of development-economic system. As a result, the instability and constant readiness of the system to "turn over" at a slight disturbance is an inevitable price to pay for the establishment of a new highly ordered state of the system. Agreeing with P.F. Drucker, who in his book "The Age of Gap: Guidelines for Our

Changing Society" speaks of the formation of the economy of the future, where knowledge becomes the main competitive advantage, and that this "will require a revision of the procedures and rules of work of modern companies, global social and economic changes", we note the importance of identifying sources of knowledge as the main resource of the new economy and ensuring access to them. At the same time, it should be noted that the growth of basic education of personnel, vocational-training and qualification of individual workers, the increase in the level of their professional skills and competencies in accordance with the needs of the labor market, a creative approach and creative thinking have a positive effect on the selection and completeness of the use of sources of knowledge. Table 5 shows the results of the analysis of the definitions of the concept of "knowledge" as a key category of the new economy.

Table 5. Definition of the concept of "knowledge" as a key category of EZ

Link from References	Definition
The Newest Philosophical Dictionary. A.A. Gritsanov - M n . : I z d . V . M . S k a k u n , 1998. 896 p.	Knowledge is selective, ordered, obtained in a certain way (method), in accordance with any-criteria (norms), formalized information that has social significance and is recognized, as knowledge, by certain social subjects and society as a whole.
Soviet Encyclopedic Dictionary. -Soviet Encyclopedia, 1981. 1600 p. (In Russian)	Knowledge is a practice-tested result of cognition of reality, its correct reflection in human consciousness.
Logical dictionary: DEFORT Ed. by A.A. Inin, V.N. Perevezen, V.V. Letrov. M; Thought, 1994. 268 p. (In Russian)	Knowledge is a system of abstract objects accessible to the understanding of a specific person or a community of people. Knowledge is not any system of abstract objects, but precisely those that are accessible to human understanding
http://www.lcm.in provementre	Knowledge is information necessary for people, used by them according to certain rules and, in accordance with certain procedures and taking into account the attitude (understanding, approval, ignorance, agreement, denial, etc.) of people to the information
Knowledge search as the basis of knowledge management http://www.vest.msk.ru	Knowledge is the understanding acquired by actual experience
Knowledge search as the basis of knowledge management http://www.vest.msk.ru	Knowledge is a state of awareness of something-or possession of information; the range of awareness or awareness

In the definitions considered, it is often emphasized that knowledge is a broader and deeper

concept in comparison with information. It is a mobile combination of different elements (experience, values, information and expert understanding), it is

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intuitive (characteristic of people and is an integral part of human essence with its unpredictability.

"follow-up" (table 6).

Table 6. Classify knowledge based on follow-up

Types of knowledge	Characteristics of types of knowledge
Knowing the "what"	The basic meaning of knowledge. Represents generally accepted "facts" as well as experience and access to training. For example, a skilled worker instinctively knows that a certain unit is the cause of a breakdown. Professionals can instantly assess the situation much faster than many analysis options based on the use of information technology.
Knowing "how"	It is the knowledge of how to perform actions. In part, this knowledge is manifested in organizational procedures, but, in practice, it is mostly implicit and resides in people's heads. New methods of process modernization are born out of practice faster than they are reflected in instructions and procedures. Mastering the knowledge of "how" (know-how-) depends on skills and experience, which take time to develop and improve.
Knowing the "who"	Knowing the "who" can help. Like other categories, knowledge is based to a certain extent on judgment and the ability to assess the skills and strengths of another person. -
Knowing "when"	Sense of time. For example, qualified brokers seem to have a flair to buy when everyone is selling. Some companies have turned their ability to determine the exact timing of an acquisition or market entry into the market.
Knowing "where"	Knowing where it is best to take action. The drivers of change increase their impact or reach a critical mass in certain places where people with certain qualifications are concentrated.
Knowing the "Why"	It assumes a broader context and vision than previous types of knowledge. Such knowledge allows people to approach unstructured problems in the most appropriate ways. For example, meeting the needs of the client in a way acceptable to the organization, and not unquestioning adherence to the procedure.

This approach is based on the idea that knowledge cannot be separated from activity, and that knowledge of what, who, how, when, where and why an action will be performed is the most important resource of the firm.

According to I. Nonaka, H. Takeuchi, knowledge can be stored both at the individual and collective levels.

The classification of knowledge is presented in Figure 4.

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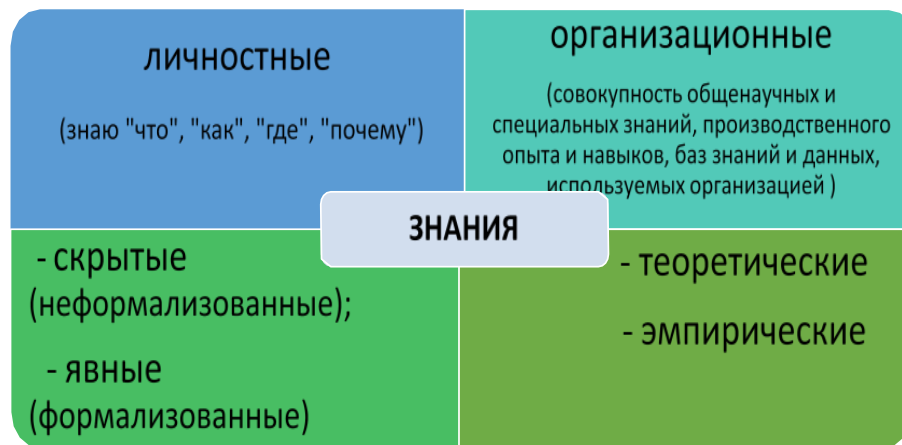


Figure 4. Classification of knowledge according to I. Nonaki, H. Takeuchi

Kofman E. believes that practical/conceptual knowledge is - individual, and technical/cultural knowledge is collective. The key knowledge in relation to a company/organization is the knowledge that ensures its competitiveness in the market. In relation to a particular employee - , it increases the efficiency of managerial, communicative, production operations performed by him and contributes to the development of his career in this organization. Therefore, it is worth using this combination tools (organizational, communication, technological), which will help economic actors successfully develop their strategic directions and solve tactical problems.

According to the degree of structure, it is customary to distinguish the following categories of knowledge:

- structured knowledge (represented by algorithms, formulas, theories, schemes, etc.);
- semi-structured knowledge (in the form of judgments, subjective assessments, heuristic rules for solving problems, etc.);
- unstructured knowledge (not having a clear theoretical basis, not confirmed by experience, etc.).

Next, we will present the systematization of knowledge developed in 2024 by experts from the EC (European Commission) (Table 7).

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Table 7. Systematization of knowledge developed by experts of the European Commission

Types of knowledge	Characteristics
Scientific	knowledge generated by universities, public research-institutes and the private corporate R&D sector
Technical	technological knowledge, the main suppliers of which are companies in the business sector conducting their own research and development, business sector institutions and state scientific institutions, universities
Innovation	innovations carried out by companies in the enterprise sector and newly created enterprises
Human capital	capital created through the activities of universities for the training of specialists and highly qualified personnel; in the process of research in the public and business sectors, as well as in other specialized institutions of higher professional education
Qualification	the result of higher education, training in the corporate sector, as well as professional courses and professional- experience of employees in all sectors of the - economy, including the research sector
TIC	The type of knowledge is created in the corporate information- and communication technology sector and is disseminated through the use of ICT and networks

The specificity of knowledge necessitates significant adjustments to the study of modern economic processes and relations in theoretical and practical aspects, namely:

Firstly-, knowledge (as a product) is characterized by discreteness: knowledge is either created or it is not;

secondly-, "knowledge", similar to a social product (public good), being already created, is available to almost everyone;

-thirdly, knowledge, as an informational product by nature, does not disappear after its use (unlike a material product).

No matter what price the distributors of knowledge set for their product, it is impossible to sell the maximum number of "copies of knowledge", although copies cost practically nothing (copying costs are insignificant). In the case of a high price, there will be few buyers. With a small price, there may be a lot of purchases, but at the same time, the revenue may be less than in the case of a high price. There are a number of studies that show that in the EZ, the mechanism traditional for market conditions of management does not lead to effective states. Effectiveness is achieved in the case of the use of a price of a discriminatory nature, that is, prices designed for a specific consumer. Based on the presence of the listed properties of knowledge, it is

necessary to point out:

- the impossibility of extending market laws to knowledge;
- the need to revise the legal framework and improve laws relating to intellectual property;
- concentration of fundamental knowledge in several centers, and applied knowledge can instantly spread around the world.

In his 1997 work "New Rules for the New Economy", K. Kelly examines 12 laws of the development of the network economy, which, in our opinion, still deserve close attention:

1. The law of communication: if the number of nodes grows as N , then the number of connections grows as $N*N$. A network is a collective interaction that binds together trillions of animate and inanimate objects through fiber or air. Such a Network gives rise to the Network Economy. These sudden global changes are literally breaking old laws and preparing the ground for a nascent economy. So far, we are only on the way to SE, where, in addition to billions of people, there will be completely new participants: smart phones, computers, and many others.

2. Law of Completeness/"Law of Fax"): The more nodes a network has, the more valuable it becomes. The logic of the network turns traditional values upside down, turning them upside down. When the cost of the next copy becomes negligible, the importance of standards and networking increases

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dramatically.

3. The law of exponential growth: A network behaves like a biological system in which exponential growth is associated with a rapid increase in the network's connections, even with a small increase in the number of nodes.

4. The law of turning points: transformations in the system occur as a result of bifurcation jumps (at breaking points).

5. The law of increasing returns: increasing returns are created by all participants in the network, they also share the profits. New participants increase the volume of the network, and it, as it increases, involves new participants. However, SE rewards those who promote decentralization by punishing others.

6. The law of reverse pricing is due to the fact that the best on the Internet is getting cheaper every year. Chips that are constantly getting cheaper, while having high performance and quality, are being integrated into the growing network, which leads to the creation of more advanced versions of network communications. The price per bit transmitted decreases along an asymptotic curve towards the zero level, but naturally does not reach it. In addition, all objects that can be copied (tangible/intangible) adapt to the law of inverse pricing and become cheaper as they improve.

7. The Law of Generosity: The value of a product is proportional to its abundance, so the flow of copies increases the value of each one. Not only that: the more copies are made, the more necessary they become, so the distribution of the product begins to support itself. By selling upgraded versions of the product or additional service to it, the company can ensure its competitiveness.

8. The law of loyalty: one of the basic properties of a network that has neither a clearly defined center nor clear boundaries. Grid companies will perish if the Net doesn't thrive.

9. The law of time descent: economic agents have to constantly change in order not to find themselves in the position of "the world's best expert in a rapidly dying technology." It is necessary to discard manufactured products, expensive technologies and proven methods in order to rise even higher.

10. The law of substitution of material values with information.

11. The law of the churn: Any innovation is always destruction. Change is usually a rapid change in - something. The churn, on the other hand, symbolizes the creative power of destruction. It not only destroys something-old, but also creates a platform for innovation and birth.

12. The law of inefficiency: do not solve problems, but look for new opportunities. The paradox is that the development of technology does not lead to a significant increase in productivity. Productivity will never become a bottleneck in SE: it plays into the

hands of human aspirations: repetition, copying, automation are devalued, and originality, imagination, and creativity are growing in value. Let the robots take care of performance. "High productivity often only means that people are very quick and adept at doing the wrong job. What can be measured by labor productivity must be forgotten."

Thus, the authors focus on new phenomena typical of the modern development of the ICT-based economy. The value of the premises of K. Kelly et al. lies in the fact that they show the full depth of the processes of transformation of the economic system, which are associated not only with its reorganization, they lead to a change in the fundamental principles of its functioning.

D. Bell, noting that the rapid informatization of modern mankind and the formation of a global communication system reflect the fact of its transition to a new, more complex state, characterized by multiply increased correlations between individual members of humanity, cites such principles of the new economy as:

1. Only one capital is important – intellectual capital.

2. Humanization of labor: from the conveyor to the manufactory of the third millennium. At the center of the new economy is a person, who is a generator of ideas and a source of capital. The process of humanization of labor will proceed in three main directions, namely:

- transfer of an increasing number of routine operations to machines;
- transformation of organizations from a vertical management method to the principle of "team play";
- the creation of more and more "friendly conditions" for work, including remote employment.

3. The aristocracy of the majority - is a new configuration of society: new social strata and groups with their own interests appear.

4. Information and knowledge are the main objects of management. Information and knowledge are the flesh and blood of the new economy. Its leaders are the organizations that process information and share knowledge the fastest and best.

5. The network structure is the way to the globalization of business. Not only is the traditional structure of the economy changing, but a "new enterprise" is also emerging. The principle of vertical integration of companies is being replaced by new forms and models of business organization. The network distributed structure becomes the leading one.

6. Think globally – act locally. Competitive advantage in the new economy will be determined by the availability of unique products: products, technologies, business-ideas, business process organization models. One of the most important factors of competition is time. The stability of the company's position depends on the maximum

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reduction of the period from the emergence of an idea to the introduction of a product to the market with a simultaneous increase in labor productivity, increasing production flexibility, and reducing all types of costs. The new economy is an "oversaturated solution" of companies that specialize in highly professional performance of one business process and have the greatest intellectual capital in their niche. With the emergence of a new idea, an "organization-core" appears, around which a community immediately "crystallizes", a network of specialized organizations uniting around the process of creating and delivering a service or product to a specific consumer.

To act locally means to concentrate all the resources of the company on a priority area where the organization can take the lead.

In the new economy, global standards are being formed. Thinking globally means planning the implementation of your exclusive product (idea, product, service) in as many industries, regions, and processes as possible. Technologies and processes are becoming universal, and convergence is becoming a leading trend. That is why local exclusive solutions are becoming so widespread.

7. Consumer-driven economy. At the center of the new economy, the consumer is a specific individual customer. It is the orientation towards the satisfaction of differentiated individual needs that ultimately determines all the other principles of the new economy. The goal of any company is to create a community of loyal customers, supporting customer loyalty in every possible way; making the most of the opportunities of the already conquered community. community, the organization seeks to make the most profit from it. That is why goods turn into "extended goods", which include many additional services. And the companies themselves are exploiting their business-technology, offering new products and services to the audience.

Speaking about the knowledge economy as a complex system, N.N. Moiseev noted that "the knowledge economy is a balanced set of elements. If

something-is holding back a country's economic growth, it is not necessarily a lack of technological infrastructure or qualified engineers. It may be a lack of entrepreneurs or adequate economic initiatives." The states of the future should acquire such characteristics as:

- a strong social policy (especially in the field of education);
- Continuous coordination of the activities of key government institutions among themselves, as well as between them and the productive sector,
- Extreme focus on innovation and R&D,
- a new type of industrial policy,
- constant attention to the future.

We are talking about the importance of creating such conditions in which the accumulated knowledge and experience can be effectively used to solve specific applied problems. Knowledge management can be represented as the process of transforming all types of intellectual assets into new value and increased competitiveness, or as a set of strategic and operational efforts aimed at increasing the use of intellectual capital in order to increase efficiency (profitability).

Although the process of knowledge management can be presented in different ways-, in most cases it comes down to the fact that knowledge management means managing the processes of transforming information into key knowledge, as well as the acquisition, dissemination and exchange of knowledge.

We will understand the category of "knowledge management" as the activity of managing the process of generation, search, selection, acquisition, distribution and commercialization/materialization of knowledge, which involves the coordination of various aspects of personnel management, innovation and communication management using the latest IT technologies. In other words, knowledge management is the process of creating intellectual capital (IC) by creating conditions/environment for transforming information into the main production resource, experience in effectively solving vital problems (Table 8).

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Table 8. Stages of acquiring and assimilating new knowledge

Stage	Characteristics of the stage
1. Define	Determining what knowledge is critical to the success of an organization
2. Collect	Acquisition of existing knowledge, experience, methods and Qualifications
3. Select	Formation of the flow of collected, ordered knowledge, assessment of its usefulness
4. Store	The selected knowledge is classified and entered into the corporate memory
5. Distribute	Knowledge is extracted from corporate memory and becomes available for use
6. Apply	Practical use of knowledge in the implementation of tasks, problem-solving, decision-making, ideation, and learning
7. Create	New knowledge is revealed through customer observation, the use of feedback, causal analysis, benchmarking, experience, research, experimentation, creative thinking, data development
8. Sell	On the basis of intellectual capital, new products are created that can be sold outside the enterprise

Taking into account the above, Figure 5 presents a conceptual model of the knowledge economy, which we will understand as a balanced set of basic elements, including principles and priorities, prerequisites and conditions for the development of the knowledge

economy, its characteristic features and value systems, subjects, functions, factors and a number of other components.

The characteristics of the main elements of this model are presented in Table 9.

Table 9. Elements of the basic model of the development of the knowledge economy

Element	Table of Contents
Objectives	The trajectory of sustainable noospheric economic growth to solve the problem of finiteness and exhaustibility of natural resources as a modern global challenge of social development to the maximum extent possible Ability of independent innovative development Increase in the CPR of economic factors Entry into the scientific and economic space Growth of personal and social well-being
Priorities	Creating conditions for the demand for the results of the research; Creation of a NIS adequate to the knowledge economy; Formation of development institutions; Development and maintenance of human potential. Modernization and re-equipment of the economy based on high technologies Creating an infrastructure that can give impetus to the development of the knowledge economy
Subjects	State, scientific community, business structures, civil society
Resources	Fundamental and applied knowledge (research-, development-and technological work) Intangible assets of economic agents Market assets Infrastructure capital Cultural Values and Traditions of Society High educational level of the population, intellectual and business qualities of personnel, qualification and ability of employees to work

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Principles	The principle of openness, the principle of priority of the cognitive environment The principle of integration of the interests of the scientific community, business, the state and society within the framework of social consensus The principle of preferential leadership in breakthrough areas of science, engineering, technology; The principle of programming that replaces stochastic innovations with the orderly and systematic development of innovations The principle of consistency of innovative institutions The principle of innovative alignment The principle of strategic variability The principle of a creative and constructive approach
Terms and Conditions	Developed innovation environment Stable domestic socio-economic and political environment; Freedom of scientific creativity; Integrated State Policy; Development of knowledge management mechanisms, etc.
Factors	Increasing role and importance of intellectual capital. Informatization and networkization of the economy as the ability to apply the results of fundamental and applied developments, innovative products and technologies. Formation of economic development institutions

The ultimate goal of the development of EZ is the transition to a new state of society based on the production, dissemination, accumulation, updating, increase and use of theoretical and applied knowledge, which will ultimately contribute to the growth of personal and social well-being of the population.

The main priority in the new economy is the ability to work with knowledge, to stay ahead of competitors in the interdisciplinary search for innovative solutions and breakthrough technologies.

The functions of EZ are determined by a number of its features that reflect the specifics and nature of this phenomenon, which include science intensity, knowledge capacity, innovativeness, globalization, human-centeredness, long-term orientation, intellectual nature of labor, acceleration of the spread of innovations and information, growth in the need for knowledge as a production factor and the main resource, and manifestations of synergetic effects.

As the most important principles of the formation of the EZ, we have identified the following:

- the principle of priority of the cognitive environment aimed at the effective use of the intellectual resources of the SES, their predominance over material ones;
- The principle of strategic continuity is innovative-
adaptive development of solar power plants;
- the principle of integration of the interests of the state, business, the scientific community and society within the framework of social consensus;
- the principle of advanced development or leadership in breakthrough areas of science, technology, engineering;
- the principle of complexity of development institutions;
- the principle of innovative alignment, which makes it possible to spread progressive innovations

not only in high-tech sectors of the economy, but also in traditional industries, and a number of others.

These principles are aimed at ensuring the process of continuous generation, diffusion and commercialization of knowledge as a key resource in the new economy. The property of the inexhaustibility of "knowledge", which acts simultaneously as a factor of production (economic resource) and as a product, requires a rethinking of the traditional understanding of national wealth as the sum of natural and capital resources. This actualizes the solution of problems related to the reproduction of human resources, the socialization of the economy, the ultimate goal of which is the reproduction of a highly intellectual personality.

The following should be singled out as the most important aspects of the formation of EZ:

- creation of a favorable investment climate and encouragement of investment, especially in high-tech industries;
- the development of science and technology as an essential resource for economic growth;
- creation and support of competitive conditions for all economic agents in order to encourage innovation and increase in labor productivity;
- the formation of a workforce capable of adapting to rapidly changing conditions and having the skills to manage emerging risks;
- and the promotion of a flexible institutional environment, especially in the field of public administration.

The presented conceptual model of the knowledge economy can be taken as the basis for the development of a methodological approach to assessing the level of its development, determining the state of structural elements and the quality of relationships between them.

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Thus, it is expedient to lay an endogenous model of economic growth in the basis of the formation of EZ, which optimizes the use of internal resources, mechanisms of organization and self-organization of economic systems in conditions of high dynamics and uncertainty of the external environment. The specificity of the knowledge economy requires a certain methodology that is adequate to the increasing complexity of system-forming economic relations inherent in a new type of reproduction. based on established paradigms of understanding society and business become ineffective. At present, the achievement of long-term economic benefits and potential advantages for any economic system (ES) becomes possible only as a result of the transition to an innovation-oriented model of development. At the same time, in order to ensure competitiveness based on innovations, it is important to create a favorable environment for intensifying the innovation process, to promote the transition of territorial ES, and through them the entire national economy, to a social-economic interactions of a higher order.

As a rule, a significant part of the problems that arise in the process of cardinal changes (transformations of the economic system) are due not only to economic reasons, but to a complex interaction of geopolitical, social, economic, and technological factors caused by changes in institutional conditions, the structure of property rights, rules and mechanisms for decision-making in the field of state policy, etc. their continuous transformation and modification, covering all levels (micro-, meso-, macro-, mega-) in unity, interconnection and interpenetration, since their development forms a single process of economic movement. In the context of the general theory of systems, the transformation of ES can also be defined as the process of transition from one state of the system to another, by modifying the interconnections, composition/structure of elements/subsystems, which together lead to an inevitable change in the emergent properties of the system.

Speaking about the cardinal changes in the development of the ES in this aspect, it should be noted that transformational shifts consisting of processes of various nature (controlled and uncontrollable, subjective and objective, external and internal, market and non-market in nature, etc.), overlapping each other, are complex and contradictory. At the same time, the specifics of the

implementation of these processes make it possible to distinguish different types of transformational shifts depending on the prevailing factors underlying them.

Transformation, which is based on internal factors of development, is usually characterized as *organic* (it is inherent- in the pioneer countries), while for the rest *it is characteristic of catch-up inorganic* modernization, moreover, under the influence of exclusively external factors. With the combined influence of external and internal factors, there is a *mixed* transformation.

Within the framework of modern society, most of the transformation processes carried out in countries are of a mixed type. Since, on the one hand, the factors are involved, the formation of which is due to the socio-economic-development within the country, - on the other hand, the factors of global competition, which initiate the desire for accelerated economic growth. The transformation process is aimed at radical renewal of all components of -socio-economic growth.

Thus, given that this process depends on the correct identification of factors, mechanisms of transformation, as well as the ability of society to perceive these processes, we will focus on the main factors, economic structures and institutions that are subject to change in the first place. In the literature, the following factors are singled out that have a prevailing influence on the transformation of almost any-socio-economic system:

- acceleration of scientific- and technological progress;
- globalization and localization (globalization);
- growing interdependence and increasing intensity of international relations;
- interconnection of technological, organizational factors of system development;
- the processes of socialization, institutionalization and politicization of the economy;
- changes in the nature of the combination of market and non-market relations;
- informatization and intensification of economic time, reduction of the life cycle of products/services (Figure 5).

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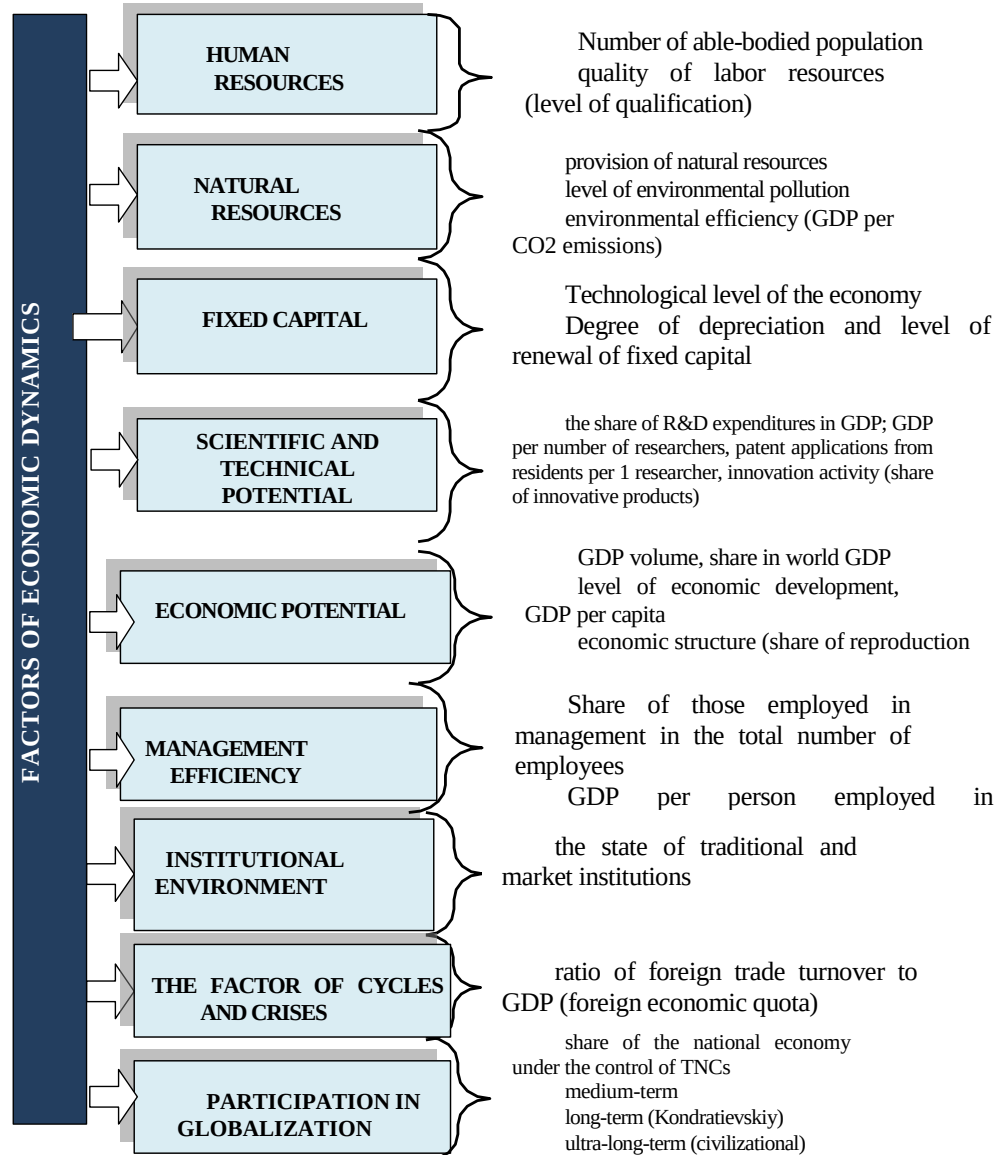


Figure 5. Factors of Dynamics of Modern Economic Systems

It is advisable to combine the key factors that determine the socio-economic- and scientific-technological-dynamics into groups:

Internal primary factors:

- labor resources, their dynamics and quality;
- institutional environment (the state of traditional and market institutions);
- natural resources and the level of emissions into the environment.

Material and -technological factors:

- fixed capital, its technological level, degree of depreciation and innovative renewal;
- scientific-and technical potential, the share of spending on science in GDP, patent applications from residents;

Economic factors:

- economic potential, level of economic development, structure of the economy;

- the effectiveness of management, the level of competence of the political and business elite.

External factors:

- inclusion in globalization, the ratio of foreign trade turnover to GDP;
- the share of the national economy under the control of TNCs;
- the factor of cycles and crises, the interaction of phases of medium-urgent, long-term (Kondratieff) and ultra-long-term (civilizational) cycles in the world and national economy.

Next, let us consider the current trends in the dynamics of these factors.

At present, humanity is faced with the action of global technological trends associated with the emergence of new products and markets focused on expanding the possibilities of meeting current demand

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and/or generating radically new needs for end users. Thus, under the influence of new technologies, the entire economic architecture and the existing value chains are being transformed. For example, links that typically accumulated a significant share of new value creation are being significantly altered by platform solutions that significantly reduce the number of intermediaries and create direct contacts between producers and consumers. The cross-cutting nature of emerging technological solutions changes approaches to economic, managerial and regulatory issues.

The study made it possible to identify the following trends in the development of the world economic system, which determined the main conditions for the formation of a new economy.

1. The dynamics and quality of economic growth increasingly depend on technological shifts based on innovations, which is manifested in the outstripping rates of development of high-tech industries, an increase in high-tech production, and an increase in the innovative activity of economic sectors.

2. Industries of a new technological generation are emerging, located at the intersection of digital technologies and the real world. Modern platform solutions contribute to building a sharing economy. Big data technologies act as a critical resource for knowledge generation and value, which allows us to talk about data-driven innovations. Digital hubs allow you to maximize network effects:

- use the intellectual capital of consumers, partners, suppliers when creating a product,
- collect and manage personal data.

The use of network services, for example, advanced service platforms based on modern IT-technologies (artificial intelligence, Internet of Things, robotics) and human-machine-interaction, make it possible to accumulate the necessary data for the release of new customized (personalized) types of products and services. Thanks to the involvement of consumers in the development of personalized products, network technologies allow the development of innovations generated by (customer-driven innovations). According to the opinion, the ability to customize products is becoming a key competitive advantage in the global market. In the production of personalized goods/products, it becomes possible to flexibly reconfigure equipment, significantly reduce production costs, that is, to produce complex individualized products, adapting them to customer requirements quickly and with almost minimal costs. The cost of such products is regarded as comparable or even less than the cost of similar goods in mass production.

It should be noted that the transition to the markets of personalized goods and services in Russia is constrained by the "narrowness" of the domestic market for innovative solutions. On the one hand, it is the lack of important technological competencies with the high cost of existing imported solutions in the field

of advanced technologies. Therefore, a significant part of companies are not yet ready to switch from established practices to new technological solutions, since routines turn out to be more profitable in the short term- and the medium term. On the other hand, there is a lack of consumer demand, a lack of demand for customized products due to the lack of experience and the necessary infrastructure (digital platforms).

3. There is an acceleration of scientific- and technological development, the life cycle of products, the period of research, development and implementation of innovations, as a result of which competitiveness is increasingly determined not by price, but by technological factors.

4. As a result, the transfer of knowledge from the scientific to the production sphere acquires a constant, purposeful character, the share of extra-budgetary financing of R&D increases, the absolute value of resources involved in the innovation process increases, and interdisciplinary research expands. knowledge, innovations and economic benefits are formed within the framework of a new integral model, in which the role of the institutional environment is sharply increasing. If in the industrial era the innovation process was one-dimensional (consistent advancement of knowledge from fundamental science to applied science and then to the sphere of production), then in the post-industrial era it becomes multidimensional (circulation of knowledge between different institutional sectors through direct and reverse links). Thus, over several decades, the model of creating innovations has undergone a serious historical evolution and has become fundamentally more complex: from the creation of closed innovations by individual manufacturing companies- (Schumpeter's concept of 1934) to end-user innovations, then to the concept of strategic innovations, and, finally, to open business innovations in the context of mass outsourcing (Chesbrough's concept of 2025).

5. Innovations cover not only technological changes, but also social and managerial spheres. There is an increase in their socio-economic-return, the diversity of information sources increases, and the number of participants in innovation activity increases. form a certain ecosystem (the concept of collaborative innovation networks by P. Glur). The intensive development of ICT leads to a compression of hierarchy as a result of the spread of network forms of business organization, the development of horizontal links that facilitate access to knowledge and information. Also, the development of the network environment results in the complication of the structure of economic systems. Network communities are being formed - innovation ecosystems, which are networks of stable connections between people, organizations and their solutions, arising on the basis of joint strategies for desirable transformations. Such networks can be formed at different levels (from

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internal to global), be designed for the interactive nature of the emergence of innovations and their collective nature.

The interactivity of the innovation process means that it becomes distributed, dispersed (diffusion) and decentralized, even if it is centrally funded by the state. Innovation flows are dispersed between official and business circles, universities, research centers, members of professional communities and individual information spheres, making up a single complex complex of knowledge and technology applications in the modern economy. In the following years, the Scandinavian ideas were widely disseminated throughout all OECD countries, which adapted them to their national and regional specifics. Today, not only in developed, but also in many developing economies (for example, China), territorial innovation ecosystems are being formed, designed to achieve world-class innovative effects. They are innovation hubs, or similar network communities, that allow territories to continuously renew the goods produced, flexibly responding to technological and market changes.

Coordination and integration of innovation activities within the framework of international scientific and technical cooperation is intensifying-as a result of the growing openness of the economies of various states. If in the industrial era industrial production was organized in the form of national value chains, and international corporations developed foreign trade in raw materials and finished products, then the further intensification of international economic relations and the development of ICT led to globalization and the widespread formation of global value chains, which in the 1990s covered the industrial processing sector, and since the 2000s-the service sector. In order to save costs, high-tech corporations in developed countries (since the 1980s-in the United States, and later in Europe and Japan) have resorted to a massive offshoring strategy, outsourcing the labor-intensive, least profitable stages of value chains to developing countries with cheap labor. leaving highly profitable science-intensive stages related to the development of innovations and service. As a result of outsourcing and offshoring, global chains have begun to horizontally permeate sectors and countries, ensuring the growing diversification of the global economy. This practice has caused a radical restructuring of vertically- integrated forms of business organization. This restructuring is described in the literature as a process of compression of hierarchies or disaggregation and decentralization of management of classical corporations. - A network structure built on

the cooperation of many independent small and medium-sized firms.

6. The role of political will and participation of the state in the development of the economy's potential to absorb and disseminate emerging innovations and technological solutions is significantly increasing, which ultimately determines the competitive position of states in the world. From the standpoint of the development of state policy, the spheres of interaction within the framework of the triad "state, society, business" are expanding--, allowing to- take a fresh look at the classic dilemma between horizontal and vertical structural policies, the need to prioritize and implement broader measures that cover all sectors of the economy to varying degrees. These processes directly affect the spheres of public administration: education, science, intellectual property protection, innovation and investment policy, and the formation of a favorable business climate. Today, there is a growing understanding all over the world that building up the innovative potential of the regions and all its components, ensuring the involvement of all subjects of the innovation process in innovation networks aimed at the development of high-tech industries, are becoming closely interrelated political tasks. Moreover, world experience shows that the less developed the economy, the greater the role of the state in the process of formation and development of a new economy. The basis of modern industrial policy should be based on such an organizational restructuring of the production landscape that would allow the industrial sector, and through it the entire economy, to increase the CSR through continuous innovation.

7. In modern conditions, for the first time in history, the rise in production is based exclusively on productivity growth, when the labor market does not grow, but on the contrary, the development of new technologies leads to its contraction. According to estimates, in the next 20 years, up to 47% of jobs in sectors related to routine labor can be automated. Technological factors of compression of the labor market are superimposed on the situation of population aging. According to the forecasts of the European Commission, in the next 40 years, Italy, Germany and Japan will suffer the greatest losses in labor resources; over the same years, the EU will lose 40 million able-bodied people, and excluding immigrants, 96 million, and for Russia, the negative trend of a decrease in the share of employment in the economy, which developed in the early 1990s-, continues to be extremely urgent, actualizing the need for continuous productivity growth to maintain sustainable growth.

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Figure 6. Fundamental changes in the development of economic systems in the new economy

8. The transition to the fifth, and even more so, to the sixth technological mode has significantly changed the role of the natural factor in ensuring economic growth. If this factor was considered as one of the main sources of economic growth until the 80s of the twentieth century, today the natural factor is gradually turning into its limiter economic dynamics due to the depletion of the best mineral deposits, the shortage of arable land and fresh water, the deforestation of tropical forests, and adverse climatic changes. At the same time, for Russia, with its significant total natural-resource potential, raw materials can become a real natural competitive

advantage, which should be used as efficiently as possible from the point of view of the environment.

In general, innovative renewal of the technological base, modernization of institutions, formation and maintenance of a competitive environment, advanced training of personnel and high-quality use of human capital with the growing role and importance of the state in solving priority tasks of innovative development are becoming the main determinants of economic dynamics both at the national and regional levels

The above is systematized

Thus, in the modern period, it is expedient to talk

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about a number of interdependent trends that reflect the evolution of economic systems within the framework of mixed modernization.

Cardinal changes that have the most significant impact on the development of economic systems in the new economy are associated with the processes of glocalization (globalization and localization), the intensification and change in the nature of competition, the spread of integration methods of conducting economic and managerial activities, the increasing role of new information technologies, network structures, the personification of market supply and demand, which are the basis for diverse in nature transformations in the economy and society.

Transformation processes, leading to structural and- technological changes in the economy, necessitate the formation and dissemination of new standards and regulations.

The development of digital technologies that modify the production process and final products requires the development of new and updating of existing standards for the materials used, manufacturing technologies and methods of product control. In order to respond to the challenges posed by global technological trends, it is necessary not only to develop national standardization, but also to actively participate in the development of international standards. The main difficulties that Russia will face in the short and longer term will be the need to develop proactive documents regulating the use of artificial intelligence, robotics, autonomous vehicles, etc.

The active penetration of technology into everyday life will require greater attention to the social aspect: the population's perception of advanced technological solutions will require new tools for interaction between the state, business and society based on the principles of inclusiveness, as well as expanding public participation in determining the scientific- and technological agenda. issues of improving education, developing an individualized approach and maintaining high activity in lifelong learning.

Conclusion

The changes taking place in the period of fundamental transformations, changes in technological platforms and ways of life pose new

serious challenges for economic entities, which are forced to adapt their strategies to the ever-increasing global competition based on innovations.

The changes that have the most significant impact on the development of economic systems in the new economy are associated with the processes of glocalization, the strengthening and change in the nature of competition, the spread of integration methods of conducting economic and managerial activities, the increasing role of new information technologies, network structures, the personification of market supply and demand, which are the basis for various transformations in the economy and society.

Innovative renewal of the technological base, modernization of institutions, formation and maintenance of a competitive environment, advanced training of personnel and high-quality use of human capital with the growing role and importance of the state in solving priority tasks of innovative development are becoming the main determinants of economic dynamics both at the national and regional levels.

The knowledge economy is usually considered as an economy that uses "knowledge" to accelerate its own growth and increase competitiveness, and the transition to the knowledge economy itself is perceived as an economic revolution or as a transition to a qualitatively new economy, including one that does not function according to the rules of classical macroeconomic theory. As a result, theories and concepts based on established paradigms of understanding society and business become ineffective.

The disciplinary ontology of the knowledge economy is at the stage of development and comprehension. There are many debatable points, as the development of the EZ creates unprecedented difficulties both in society and in business.

Today, there is a growing understanding all over the world that building up the innovative potential of the regions and all its components, ensuring the involvement of all subjects of the innovation process in innovation networks aimed at the development of high-tech industries, are becoming closely interrelated political tasks. Moreover, world experience shows that the less developed the economy, the greater the role of the state in the process of formation and development of a new economy.

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