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Ukrainian-American Concordia University
Management and Business Faculty**

MASTER'S QUALIFICATION WORK

**DEVELOPMENT OF TNC IN THE KNOWLEDGE ECONOMY
(on the basis of “Digital Benefits LTD” company)**

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Field of Study 07 – Management

and Administration

Specialty 073 – Management

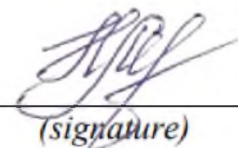
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The importance of the knowledge component in the development of TNCs.

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At the beginning of the XXI century, there is a dynamic transformation of the eras of world socio-cultural development into a new era of knowledge and creativity, which leads to the emergence of a conflict-causing situation due to the existence of several eras at the same time. That is, the formation of a post-industrial (informational and innovative) society is observed, when the era of the new economy manifests itself in a new content, where the knowledge resource reaches a qualitatively new level [1]. The very formation of the knowledge economy makes it possible to emphasize the threefold nature of TNCs: as a product of globalization and internationalization of the world economic system; as an independent subsystem of the world economy, which determines the type and nature of economic relations with other subjects and subsystems, as well as the direction and intensity of the processes of globalization and transformation of the world economy; as a mediator in the process of transgression of national and global economic interests.

Under these conditions, the totality of TNCs becomes an independent subsystem of the world economy, which exerts a decisive influence on the functioning and development of individual national economies, international institutions, integration groups, etc [2]. This, first of all, is due to the advantages of the integrated structure of TNCs, the positive effects of centralization and concentration of both financial and credit and knowledge resources, which allow them to dominate the world market, as well as get exclusive access to unique competitive advantages in the context of global changes in the world economy in the 21st century. Moreover, the corporation itself is constantly in a state of dynamic transformation and actively adapts to new conditions of the external environment [3].

The following foreign scientists made a significant contribution to the study of the processes of formation, development and analysis of the transformational activities of transnational corporations: K. Akamanu, P. Buckley, R. Barnett, J. Galbraith, J. Dunning, J. Diebold, P. Drucker, U. Dumsza, M. Cason, R. Coase, E. Learned, P. Lindert, J. MacDonald, R. Muller, etc. The issue of the knowledge economy is actualized in the works of many scientists of various scientific schools. In particular, a complex of issues that consider the essence of the knowledge economy, its forms, parameters and features are studied in the works of D. Adair, M. Bauer, B. Bass, W. Bayham, F. Bailey, K. Byrd, U. Bennis, K. The most important aspects of the knowledge component of the competitiveness of TNCs are analyzed in the works of L. Antonyuk, Y. Baskakova, B. Biloshapka, O. Bulatova, O. Butnik-Siverskyi, M. Gazizova, V. Geits, I. Gladunyak, L. Honyukova, O. Grishnova, V. Goshovsky, V. Gurievskaya, L. Danylenko, L. Edinger, K. Zhilenko, I. Kaleniuk, A. Kolota.

However, despite the significant work of foreign and domestic scientists in this field, the problems of forming a new paradigm of global development, theoretical and methodological substantiation of the genesis of the concept of knowledge economy, identification of the transnational vector of development of intellectual resources, and identification of knowledge determinants of the competitiveness of TNCs remain insufficiently disclosed. Given that production activity in the XXI century, has a global character, the issue of ensuring the knowledge resource of innovative development of Ukrainian corporations also acquires priority importance in the context of their effective promotion to the world market.

It should be noted that in the conditions of globalization, the world economy is developing in the direction of greater integrity, while at the same time feeling the influence of destructive processes, centrifugal, disintegrating forces. In opposition to these trends, the main contradiction of the era is expressed, the traditional processes of interstate integration are strengthened, the target function of which is not so much the expansion and liberalization of international markets, but primarily protectionist protection and joint customs and tariff regulation within the limits of global economic exchange [4]. At the same time, the movement towards integrity in the process of globalization is disharmonious and uneven in various spheres of socio-economic life. The movement of goods, services, and capital actually means the creation of a global reproductive integrity with all its inherent features (cyclicity, economic gaps, etc.). At the same time, in the sphere of politics,

intercivilizational and intercultural interaction, the reverse process of the movement towards integrity is taking place.

A key role in the understanding of modern economic transformations is played by the creation of a fundamentally new theory of economic and technological development, its value criteria and indicators. Traditional ideas based on the resource components of growth, which are measured by the incremental values of manufactured products, income, production volumes, etc., at the beginning of the 21st century have exhausted themselves, because the qualitative transformation of the structure and mechanism of social reproduction requires a rethinking of the system of factors and sources of economic and technological development [5]. The traditional scheme: labor, land and capital - even with the mechanical addition of science and information to it, is no longer able to explain the changes taking place in the world at the beginning of the XXI century.

Deep technological shifts in the structure of social reproduction, increasing importance of the informational component of the economy, technological development, environmental and social restrictions imposed on it, call into question the universality of the labor theory of value in the context of explaining social processes [6]. The specified theory loses its absolute significance and passes into the category of an "individual case", which is applied to a certain stage of socio-economic progress and is characterized by a relatively smooth development with the predominant or exclusive use of traditional growth factors.

It is important to note that one of the most important global trends in the formation of modern society is the transition from a raw and industrial economy to a new economy based on intellectual resources, knowledge-intensive and information technologies. The emerging new economy plays a decisive role in the development of both developed and developing countries, as evidenced by the growth of the annual turnover in the world market of high technologies and innovative and knowledge-based products, which significantly exceeds the turnover of the raw materials market, including energy resources. Production, distribution and use of knowledge form the basis of the new economy. Strengthening the role of knowledge, intellectual work, innovative technologies, computerization, development of communication networks led to the modification of the existing economic system. The change in the socio-economic order, in turn, contributed to the emergence of new types of economic activity, the accelerated development of which served as an impetus for the formation of a new economy. Thus, the new economy represents a unique phase of socio-economic development, the key role of which is played by synergies of knowledge and creativity [7]. The market of knowledge, in turn, contributed to the continuous and constant development of knowledge, which is due to the need for their constant updating to a higher level that meets the demands of the consumer. The market of knowledge forms in consumers the same attitude to knowledge as to any other product.

At the beginning of the 2000s, the leading positions in the world market were occupied by transnational corporations that focused on competitive advantages that contributed to the development of modern technical equipment, qualified personnel and guaranteed access to the necessary material resources. However, with the development of new technological structures as a result of global political and economic processes, the main condition for the success of the competitiveness of TNCs is the presence of intangible assets in the corporation focused on the prevalence of intellectual capital [8]. After all, the complexity of doing business in the modern world is due to many factors, in particular, the ever-growing competition (which has become global), the use of new technologies, the shortening of the life cycle of products, the flexibility of the functioning of the organization and business as a key factor of development, demographic trends. The ability to convert intellectual resources into goods and services with social utility and added value is becoming an important competence in modern business. In this regard, the management of intellectual capital for the purpose of obtaining profit and ensuring market competitiveness has become a relevant direction in the activities of modern companies. The economy, based on the use and active dissemination of knowledge, is characterized by the rapid growth of knowledge-intensive products; shortening the life cycle of goods and relevant professional skills; intellectualization of the technologies used, which ensure an increase in labor productivity; formation of a large market segment of intellectual products and services (such as patents, licenses, consulting)[9].

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PHEE-institute «Ukrainian-American Concordia University»

Faculty of management and business

Department of international economic relations, business and management

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Specialty **073 «Management»**

Educational program **“Business Administration”**

APPROVED

**Head of International Economic Relations,
Business and Management Department**



Prof. Zharova L.V.

“23” September 2022

TASK

FOR MASTER’S QUALIFICATION WORK OF STUDENT

Aryna Tokarenko

(Name, Surname)

1. Topic of the master qualification work

Development of TNC in the knowledge economy

(on the basis of “Digital Benefits LTD”)

Consultant of the master thesis **Ph.D. in Economics Chaplynska N.M.**,

Which approved by Order of University from **“14” September 2022 № 14-09/2022-6c**

2. Deadline for master thesis submission **“23” December 2022**

3. Data-out to the master thesis are:

Materials from internship received in Digital Benefits LTD and from the open resources

4. Contents of the explanatory note (list of issues to be developed)

1) to investigate the essential features, imperatives of formation and directions of development of the knowledge economy in order to form a theoretical and methodological basis for their analysis;

2) reveal the positioning of knowledge resources in the model of intellectual development of TNCs;

3) to determine the features of the globalization of knowledge at the corporate level;

4) to analyze the peculiarities of TNC knowledge management in the paradigm of the new economy;

5) develop and substantiate a universal model of TNC knowledge management;

6) to analyze the effectiveness of the management of knowledge resources of TNCs in the world economy.

5. List of graphic material (with exact indication of any mandatory drawings)

Tables:

1. Stages of evolution of theories of knowledge economy

2. Stages of evolution of theories of knowledge economy

3. Levels of knowledge utilization of MNCs







Figures:

1. Components of the “knowledge” capital of TNCs in the context of the development of the knowledge economy

2. The strategic vision of TNCs in the paradigm of the knowledge economy

3. Cartographic scheme of average values of the Knowledge Economy in Ukraine

6. Consultants for parts of the master thesis

Part of the project	Surname, name, position	Signature, date	
		Given	Accepted
1	Natalia Chaplynska		
2	Natalia Chaplynska		
3	Natalia Chaplynska		

7. Date of issue of the assignment

Time Schedule

№	The title of the parts of the diploma project (work)	Deadlines	Notes
1.	I part of master thesis	07.10.2022	In time
2.	II part of master thesis	28.10.2022	In time
3.	III part of master thesis	18.11.2022	In time
4.	Introduction, conclusions, summary	5.12.2022	In time

5.	Pre-defense of the thesis	13.12.2022	In time
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Student  Tokarenko Aryna

Consultant  Natalia Chaplynska

Conclusions: The Master's qualification work is designed at the high scientific level, and its content and structure fully meet the methodological requirements. The study provided a meticulous analysis of the development of knowledge economy in the transnational corporations.

The work contains all the necessary parts of scientific research with empirical and theoretical recommendations. The paper includes a well-developed theoretical approaches to the knowledge economy studying and provide deep analysis of the competitive development of TNCs in the global knowledge market. The practical recommendations were formulated correctly and focused on the main goal and tasks of the work.

In general, if successful defense, the thesis can claim to be "excellent".

Consultant  N.Chaplynska
(signature)

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INTRODUCTION

Justification of the choice of research topic. At the beginning of the XXI century. there is a dynamic transformation of the eras of world socio-cultural development into a new era of knowledge and creativity, which leads to the emergence of a conflict-causing situation due to the existence of several eras at the same time. That is, the formation of a post-industrial (informational and innovative) society is observed, when the era of the new economy manifests itself in a new content, where the knowledge resource reaches a qualitatively new level. The very formation of the knowledge economy makes it possible to emphasize the threefold nature of TNCs: as a product of globalization and internationalization of the world economic system; as an independent subsystem of the world economy, which determines the type and nature of economic relations with other subjects and subsystems, as well as the direction and intensity of the processes of globalization and transformation of the world economy; as a mediator in the process of transgression of national and global economic interests.

Under these conditions, the totality of TNCs becomes an independent subsystem of the world economy, which exerts a decisive influence on the functioning and development of individual national economies, international institutions, integration groups, etc. This, first of all, is due to the advantages of the integrated structure of TNCs, the positive effects of centralization and concentration of both financial and credit and knowledge resources, which allow them to dominate the world market, as well as get exclusive access to unique competitive advantages in the context of global changes in the world economy in the 21st century. Moreover, the corporation itself is constantly in a state of dynamic transformation and actively adapts to new conditions of the external environment.

The following foreign scientists made a significant contribution to the study of the processes of formation, development and analysis of the transformational activities of transnational corporations: S. Young , K. Akamanu, P. Buckley, R. Barnett, J. Galbraith, J. Dunning , P. Drucker , U. Dumsza , M. Keson , R. Coase , E. Learned , P. Lindert , J. McDonald, R. Muller, R. Narulla, F. Nickerbrocker, P. Nueno, G. Parker, A. Ragman, S.

Rolf, B. Scott, R. Stobach, J. Stopford, L. Turner, M. Wilkins, L. Wells, M. Holman, K. Christensen, N. Hood, A. Chandler.

The issue of the knowledge economy is actualized in the works of many scientists of various scientific schools. In particular, a complex of issues that consider the essence of the knowledge economy, its forms, parameters and features are studied in the works of D. Adair, M. Bauer, B. Bass, U. Bayham, F. Bailey, K. Byrd, U. Bennis, K. Blanchard, R. Blake, J. Blondel, E. Borgat, M. Weber, Ke De Vry, V. Vrum, R. Wood, M. Gunter, R. Greenleaf, S. Hryna, A. Duginets, F. Yetona, N. Gazzarda, J. Hemphill, L. Downton, R. Daft, E. Deming, P. Drucker, R. Edgeman, D. Ilgen, R. Ireland, L. Kalb, S. Kaze, Carmella, D. Katz, J. Collins, T. Kochubey, R. Crutchfield, V. Kremen, D. Krecha, T. Kuchmarski, S. Kuchmarski, U. Cowley, R. Likert, K. Levine, D. McGregor, A. McFarlane, R. Mann, D. Marcha, J. Mouton, T. Mitchell, O. Nestuli, G. Newcom, H. Owen, M. Polyakov, J. Page, O. Savruka, S. Sardak, F. Selznik, A. Semenova, N. Stezhko, P. Senge, O. Smith, R. Stogdil, A. Tannenbaum, F. Fiedler, E. Fleishman, H. Feuerholm, V. House, P. Hersey, V. Hodgson, K. Hodgkinson, E. Hollander, J. Homans, M. Houston, B. Shamir, V. Schmidt, G. Yukla, A. Yago and others.

The most important aspects of the knowledge component of TNC competitiveness are analyzed in the works of V. Geits, I. Gladunyak, L. Honyukova, O. Grishnova, V. Goshovsky, V. Gurievskaya, L. Danylenko, L. Edingera, K. Zhilenko, I. Kaleniuk, A. Kolota, K. Krutiy, O. Kuklina, N. Larinoi, V. Levina, E. Libanova, O. Lukasheva, D. Lukyanenko, M. Orliv, T. Orekhova, E. Panchenko, L. Pashko, M. Pirena, P. Senge, S. Sidenko, R. Storozheva, I. Surai, T. Fedoriva, S. Filonovych, A. Chukhna, O. Shvydanenko and many others.

However, despite the significant work of foreign and domestic scientists in this field, the problems of forming a new paradigm of global development, theoretical and methodological substantiation of the genesis of the concept of knowledge economy, identification of the transnational vector of development of intellectual resources and identification of knowledge determinants of the competitiveness of TNCs remain insufficiently disclosed. Given that production activity in the XXI century the issue of

ensuring the knowledge resource of innovative development of Ukrainian corporations also acquires priority importance in the context of their effective promotion.

The purpose and tasks of the research. The purpose of the work is to reveal the theoretical foundations and develop a methodology for systematic research on the transformation of TNCs in the conditions of the growing importance of the knowledge economy in the world.

Based on the specified goal, a set of tasks was set and solved in the work:

- to investigate the essential features, imperatives of formation and directions of development of the knowledge economy in order to form a theoretical and methodological basis for their analysis;

- reveal the positioning of knowledge resources in the model of intellectual development of TNCs;

- to determine the features of the globalization of knowledge at the corporate level;

- to analyze the peculiarities of TNC knowledge management in the paradigm of the new economy;

- develop and substantiate a universal model of TNC knowledge management;

- to analyze the effectiveness of the management of knowledge resources of TNCs in the world economy .

- to analyze the implementation of knowledge component in the competitiveness of Digital Benefits Ltd.

The object of research is the processes, regularities and trends of the functioning of the knowledge economy in “Digital Benefits LTD” company.

The subject of the study is the theoretical-methodological and scientific-practical aspects of ensuring the competitiveness of TNCs in the context of the development of knowledge resources in the world economy.

Research methods. The theoretical and methodological basis of the study was the fundamental provisions of modern economic theory, the work of leading Ukrainian and foreign scientists and practitioners in the field of the formation of a new economy, the formation of a knowledge economy, the study of the knowledge component of the

development of TNCs, the competitiveness of transnational corporations, corporate globalization of knowledge, TNC knowledge management, international business. In the research process, general scientific methods of research were used, namely: system analysis, synthesis, deduction and induction - in the analysis of the architecture of the world market of knowledge, the study of the conceptual-categorical apparatus of the formation of the knowledge economy, determination of patterns of formation and development of the knowledge resource; typology - in the process of identifying modern types of TNCs, using the alpha, beta and gamma method for grouping TNCs, analyzing competitive advantages; historical and logical - when studying the evolution of the theoretical provisions of the development of TNCs and determining the prerequisites and factors; structural and functional analysis - in order to determine the determinants of the formation of a competitive paradigm of TNCs; comparisons - when studying the knowledge management experience of leading TNCs.

The informational and factual basis of the research is the Constitution of Ukraine, laws, other normative legal acts of Ukraine and foreign countries; reporting and statistical data of the Ministry of Economic Development, Trade and Agriculture of Ukraine, the Ministry of Finance of Ukraine, the State Statistics Service of Ukraine; analytical reviews of the International Monetary Fund, the World Bank, World Intellectual Property Organization, World Economic Forum, Organization for Economic Cooperation and Development, European Patent Organization, other international financial organizations; reports of research centers and institutions, recommendations of experts, monographs, articles and other works of domestic and foreign authors on research issues.

Structure and scope of work. Master thesis consists of an introduction, 3 chapters, conclusion, list of references. Work is carried out on 153 sheets, containing 24 tables, 2 formulas and 1 figure. References include 103 literature sources and 8 appendixes.

CHAPTER I. THEORETICAL PRINCIPLES AND DRIVING FORCES OF THE KNOWLEDGE ECONOMY

1.1. The genesis of the formation of a new economy

In the conditions of globalization, the world economy is developing in the direction of greater integrity, while at the same time feeling the influence of destructive processes, centrifugal, disintegrating forces. In opposition to these trends, the main contradiction of the era is expressed, the traditional processes of interstate integration are strengthened, the target function of which is not so much the expansion and liberalization of international markets, but primarily protectionist protection and joint customs and tariff regulation within the limits of global economic exchange. At the same time, the movement towards integrity in the process of globalization is disharmonious and uneven in various spheres of socio-economic life. The movement of goods, services, and capital actually means the creation of a global reproductive integrity with all its inherent features (cyclicality, economic gaps, etc.). At the same time, in the sphere of politics, intercivilizational and intercultural interaction, the reverse process of the movement towards integrity is taking place.

A key role in the understanding of modern economic transformations is played by the creation of a fundamentally new theory of economic and technological development, its value criteria and indicators. Traditional ideas based on the resource components of growth, which are measured by the incremental values of manufactured products, income, production volumes, etc., at the beginning of the 21st century have exhausted themselves, because the qualitative transformation of the structure and mechanism of social reproduction requires a rethinking of the system of factors and sources of economic and technological development. The traditional scheme: labor, land and capital - even with the mechanical addition of science and information to it, is no longer able to explain the changes taking place in the world at the beginning of the XXI century.

Deep technological shifts in the structure of social reproduction, increasing importance of the informational component of the economy, technological development, environmental and social restrictions imposed on it, call into question the universality of the labor theory of value in the context of explaining social processes. This theory loses its absolute significance and becomes an «individual case» that is applied to a certain stage of socio-economic progress and is characterized by relatively smooth development with the predominant or exclusive use of traditional growth factors [1].

After all, against the background of global technological changes and structural restructuring of the world economy, the creation of new models of economic development, distinguished by high growth rates and the share of intellectual capital, is being put forward. The nature of the cause-and-effect relationship must be interpreted as follows: the specified world trend determines the paradigm of the economy, and the paradigm of the economy - the character, features of the era, the social paradigm, the character of the post-industrial era. It is the economic paradigm that is the criterion for determining the nature of the historical era and the social paradigm corresponding to it. In the opinion of the authors, the introduction of the principle of similarity and conformity of paradigms into scientific practice is justified. On its basis, in particular, it can be argued that a change in the economic paradigm also leads to a change in the social paradigm, the social character of the era. Moreover, the social paradigm should be adequate to the economic paradigm. In addition, it causes a change in the previous paradigms of all levels in their hierarchy. It is appropriate to note that the paradigm of the economy of the pre-industrial society corresponds to the general and higher in the hierarchy paradigm «Man is a child of nature». In the pre-industrial era, natural agricultural production prevailed, a person could not exist without involvement in the agricultural process. Man, as a link in the biological cycle of nature, had to adapt and compare his actions with the biological rhythm of agricultural production [2].

The authors of the concept of technological paradigms (technological systems) do not consider the pre-industrial era in their works, considering the beginning of the classification of paradigms (systems) to be the period of the formation of capitalism in

England, namely the end of the 18th century. That is, formally, the same stage of «rise» is connected with qualitatively different stages of technical and economic development, which is also reflected in the features of the «rise» of countries. Of course, historical studies of economic growth must be conducted for the pre-industrial era as well, but in economic and theoretical terms, we can limit the considered period by starting the analysis from the era of the formation of classical capitalism.

The paradigm of the economy of an industrial society corresponds to the paradigm «Man is the conqueror of nature». The development of the mechanization of production in the specified era required the use of mainly low-skilled labor due to the involvement of an ever-growing mass of labor in the industrial sector, in particular child and female labor. Virtually complete interchangeability of workers, a high level of competition in the labor market, the absence of a system of social protection for workers in combination with institutional factors stimulated the acceleration of the movement of a large number of people from the countryside to the city (for example, the consequences of «enclosure» in England)[3]. All these factors led to a relative decrease in the incomes of hired workers. Therefore, the growth of the final product was accompanied by a long period of stagnation of the incomes of the working class and the emergence of various «social ulcers» of capitalism, which, in particular, was noted by K. Marx in «Capital» [92].

It is appropriate to distinguish three systemic-historical types of industrial economic growth: early industrial, mature industrial and late industrial. If the representatives of early industrial growth in organizational and institutional terms were mainly firms that were in individual private ownership or in the form of partnerships, then mature industrial growth relies on corporate private ownership in the form of joint-stock companies, where capital-property and capital-function are largely separated.

Mature industrial growth requires the use of mass resources - both capital and labor, and is aimed at the production of standardized products for mass consumption. But their quality is already an order of magnitude higher than the quality of mass resources corresponding to the early industrial type of growth. Mass human capital, which is formed thanks to general education, begins to play an important role in the course of mature

industrial growth. Workers are no longer completely replaceable. To manage a complex electrified system of machines, employees with the appropriate level of training and qualifications are needed. The role of «technostructure» in making management decisions is increasing, as pointed out by J. Galbraith in his works.

From the context of research, it can be argued that cost will increasingly be determined not by production costs, but by research costs. That is why the modern paradigm of economics is actually a new formulation of the basic law of economics - the law of value: the value will be equal to the costs of research work, in particular, the post-industrial society is a research society. It is characterized by an unprecedented transfer of emphasis from production to research. In this regard, in the near future it is necessary to review, clarify, and adjust the very concept of «research» [4]. One of the important results of the research is the conclusion that any paradigm as a comprehensive complex methodological category with the above characteristics is revealed from another important side. It is a concentrated expression of an era, a criterion for determining its character, its main content. In order to clearly define the differences between pre-industrial, industrial and post-industrial society, it is advisable to analyze the data given in the table. 1.1.

From the data given in the table. 1.1, it can be argued that pre-industrial society is characterized by the predominance of an agrarian system in the economy with little or no production development. As a result of the emergence and growth of the machine industry, as well as the change from a natural economy to a market economy, there is a transition to an industrial society, which is characterized by the predominance of the industrial technological system as the dominant one and changes in the structure of employment: a reduction in the share of employment in agriculture and its growth in industry and the service sector.

Table 1.1

Comparison of characteristics of pre-industrial, industrial and post-industrial society

Characteristics of society	Pre-industrial society	Industrial society	Post-industrial Society
The leading sector of the national economy	Agriculture	Industry	Service Industries
Characteristics of society	Pre-industrial society	Industrial society	Post-industrial society
Professional structure	Peasants, craftsmen	Workers, service personnel, managers	The growth of the intelligentsia and the «technical class»
The structure of the economy	Extractive types of economic activity prevail	Traditional capital-intensive and labor-intensive industries	Science-intensive, informational, innovative industries
The main factor of production	Earth	Capital	Information, knowledge
Host social group	Landowners	Financial and industrial groups	Owners of information and knowledge

Source: systematized by the authors [4].

According to the concept of a post-industrial society, social development is considered as a progressive and staged process associated with successive changes in socio-economic systems, the limits of which are socio-technological revolutions: agrarian, industrial, and informational, respectively. At the same time, such a transition is a progressive movement, as a result of which the subsequent system does not replace the previous one, but transforms it: the post-industrial society cannot replace the industrial and even the agrarian one, it only adds a new dimension to them.

The results of the conducted analysis allow us to conclude that the concepts «innovative economy», «creative economy», «information economy», «network economy», «service economy» and «knowledge economy» are incompletely identical. The main criteria for comparing economic theories are the following: the main factor of production, the main product of production, sources of wealth, the influence of the state on the economy and the period of emergence and development (table 1.2).

Table 1.2

Correlation and relationship of various theories of post-industrial economy

	Service economy	Innovative economy	Information economy	Network economy	Knowledge economy	Creative economy
The main factor of production	Service	Innovations	Information	ICT	Knowledge	Creative – potential
The main economic resource	Intangible product (service)	Intellectual capital	Information capital	Network - /virtual capital	Intellectual , structural capital	Creative – capital
Product of production	Service	Product, service	Service	Service	Product, service	Product, service
Characteristics	Manual / automated work	Automation of production	Computerization	Computerization of society	Intellectualization of work	Increasing - the «creative beginning» in work
Employment	60-90%	50-80%	40-70%	40-50%	80-90%	60-80%
A source of wealth	Informational , intellectual rent	Technological rent	Informational , intellectual rent	Informational , intellectual rent	Informational , intellectual rent	Intellectual –rent
Period developed _	Ser. 20th century	1960–2000	1970–2000	1990–2000	2000 - XXI century.	Start 21st century

Source: created by the authors [5].

In order to determine the peculiarities of the functioning of each type of economy, it is appropriate to analyze their formation and development.

1. Service economy. The service economy is formed and developed according to certain principles. The first principle is the unity of a socially oriented economy and a socially oriented policy (focusing on a person - an employee and a person - a consumer of services.), the essence of which is reduced to the interaction of people with each other, and not with machines. The basis of this principle is human capital, the goal of the service economy is to satisfy the needs of people primarily engaged in socially useful work, and socially oriented policy must coordinate its requirements with the existing economic base. The second principle is the separation and integration of elements of a socially oriented economy at all levels. The functioning of enterprises and households requires the creation of optimal economic conditions at the macro- and meso-levels within the boundaries of social and economic policy subjects - federal, regional, local and municipal legislative and

executive authorities. At these levels, economic parameters are regulated (tax rates, bank loan interest rates, wage level, living wage, etc.) in view of their differentiation, taking into account the priority of various spheres of activity. This is achieved with the help of monitoring, which allows identifying the peculiarities of the relations of economic and social subjects. The third principle is the systematic analysis and use of sources and factors of socio-economic growth. The sources of system analysis are the possibilities of expanding the volume of natural, material and human resources. In this way, the factors of socio-economic growth, in particular technology and competence, are determined.

Unlike the industrial economy based on machine technologies, the service economy is formed under the influence of intelligent technology. If in material production investments in technology help increase productivity, then in the service sector the connection between investments in technology, its productivity and profitability is not traceable, that is, the so-called «paradox of information technologies» takes place (the reasons for which are the costly and inefficient use of information technologies; lag effect).

The service economy has the following features: value creation goes beyond material production; the emergence of employment in service sectors of the economy; creating a useful effect that can be consumed only in the process of creating a service; personalization of products and services; involvement of consumers in the service provision process; service production is increasingly turning into a collective process, generating network effects in the service economy; service as an intangible substance affects the creation of many other intangible products - servicing contributes to the emergence of «virtual factories», companies that do not have their own production, but are focused on finding customers, designing and selling a product [6].

2. *Innovative economy.* The next stage of the formation of a post-industrial society is the concept of innovative economy, which is determined by the development of the sphere of material production due to the active implementation of innovations. The prerequisites for its formation appeared at the end of the 1980s as a result of the acceleration of the pace of scientific and technical progress, which led to the emergence of a single information

space, increased capital mobility and globalization of markets. Man becomes the driving force of the innovative economy, while science is transformed into a productive force.

The theory of innovative economy was born at the beginning of the 20th century. Its founder is J. Schumpeter, who introduced the concept of «innovation» in the modern sense into scientific circulation and noted it as a factor of economic growth. According to J. Schumpeter, innovation is a new and effective combination of resources in the production of goods and services, produced in the process of interaction with the external environment. The researcher links private entrepreneurship and innovative activity into a holistic system based on «creative destruction». J. Schumpeter's theory of innovation is a self-sufficient theoretical system, the main provisions of which are included in the concept of «innovative society»: the concept of «innovation» is determined and classified with the determination of the role of innovation in economy development; innovative activity is defined as the most important function of entrepreneurs [7]. The main source of innovation capital in this economic model should be considered technological rent, in particular, unique knowledge and skills that help produce innovative goods and services, create conditions for innovative transformations. The concept of innovative economy is particularly interesting in that it pays more attention to material production, while taking into account the tendency to shift the emphasis of economic theories to intangible capital.

Innovative economy can be perceived ambiguously: on the one hand, as a generating system, and on the other, as one that perceives innovations. In the first case, it is said that in the economy, along with industry, agriculture, transport, science and education, culture and sports, there is a developed innovation system comparable in scope and importance of sectors. In particular, they mean innovation systems of different levels (world, national, regional and local), in the area of responsibility of which is the implementation of the innovation chain «science - practice». In the second case, the economy is understood as such, the main factor of reproduction and development of which are innovations created on the basis of scientific knowledge.

3. *Information economy.* Despite the development of the service economy, already in the early 1960s, F. Mahlup and T. Umesao introduced such a concept as

«information society» into scientific circulation. The very term «information economy» was analyzed in the works of M. Porat, who considered it as the economy of information goods and information and communication technologies. In this theory, such a factor as dominance in the socio-economic space of the information sector, associated with the leading role of information, is brought to the forefront.

Today, there are three approaches to the interpretation of the term «information economy». Thus, according to the first approach, the main factor determining the essence of the economy is the increase in the economic value of the information sector in the growth of GDP (F. Mahlup, M. Porat, D. Bell). Such changes in the GDP structure can be justified by an increase in the share of employment in the information sector. The second factor can be the transition from the production of goods to the production of services, where there is an increase in added value, due to the properties of the key factors of the production of the information society - information and knowledge. That is, society becomes informational when the informational sector begins to dominate the economy. This socio-economic aspect was studied in detail in the 1970s and 1980s [8]. T. Stoneyer, who considered information as a factor of production that has similar properties as capital: it can be accumulated and stored. Strengthening the informatization of society, according to his theory, leads to the fact that industry, in terms of employment indicators and its share in GDP, gives way to the service sector, and the service sector is mainly information processing. According to the second approach, the information economy is formed in connection with an increase in volumes of information in the public space - an «information explosion» that contributes to the qualitative transformation of society (T. Umesao, Y. Hayashi, Y. Ito) . Thus, J. Masuda, researching the economy of the period 1940–1970, points to the acceleration of the information revolution: information technologies are developing 3 to 6 times faster than energy use technologies, and also have a tendency towards constant acceleration in development [9].

The third approach is based on the dominance of information and communication technologies in society (E. Daffa, S. Nora, A. Minka). According to Z. Brzezinski's concept of the information society, as a result of the telecommunications revolution, a

«technotronic society» is emerging, which is formed under the influence of the development of technology and electronics, especially in the field of computers and communications. Despite the fact that the theories of the information society of the second and third approaches have a certain logic, from an economic point of view it is the first direction of interpretation that has the greatest importance for economic theory. The formation of the information economy is characterized by the dominance of the «fourth sector» of the economy after agriculture, industry and the service sector, and the key factor of production is information. In the table 1.3 gives a comparative description of pre-industrial, industrial and information society. In our opinion, the information economy is the economy of the post-industrial development of society, in which most of the gross domestic product is provided by the activities of production, processing, storage and distribution of information and knowledge.

Table 1.3

Comparative characteristics of pre-industrial, industrial and information society

Characteristics of society	Pre-industrial society	Industrial society	Post-industrial society
The leading sector of the national economy	Agriculture	Industry	Service Industries
Characteristics of society	Pre-industrial society	Industrial society	Post-industrial society
Professional structure	Peasants, craftsmen	Workers, service personnel , management Ry	The growth of intelligence and «technical class»
The structure of the economy	Extractive types of economic activity prevail	Traditional capital-intensive and labor-intensive industries	Scientific, informative, innovative industries
The main factor of production	Earth	Capital	Information
Host social group	Landowners	Financial and industrial groups	Owners of information

Source: created by the authors [10].

The main feature of this economic model is the presence of the main drivers of the development of the following industries: R&D, information and communication,

automated production, software development support, etc. As a result of the development of ICT and the spread of the Internet, the process of transferring and exchanging information becomes less expensive both in terms of time and cost. Gradually, information becomes an independent factor of production.

4. *Network economy.* The development of the information and innovation economy resulted in the formation of a network economy, one of the conditions for its formation was the replacement of the fourth technological order by the fifth in the late 1990s, in which the leading positions are occupied by the latest computer and information technologies, means of space communication, fiber optics, biotechnology. The network economy arose at the junction of the traditional economy and information and communication technologies. It should be emphasized that until 2000, the network economy was mainly called the «Internet economy» or «digital economy», however, since 2001, the international research community began to use the term «network economy» (or «electronic economy»).

The cost structure of network goods differs from the cost structure of ordinary goods, the main part of which falls on the initial period of their production (for example, writing a book and further distributing the product electronically). At the same time, network assets are not subject to the law of diminishing returns, demonstrating increasing profitability in the very long term. Accordingly, industries engaged in the production of network goods receive enormous opportunities to exploit economies of scale. The most important regularities of these goods are as follows: in the network economy, the value of labor products is related to their multiplicity, not rarity; low fixed costs and rapid distribution of products reduce the time interval before the start of rapid growth; increased return on the results of the work performed is provided by the entire network and distributed in it among all participants of the process; in the network economy, all objects that can be copied become cheaper as they are improved, and this contributes to the growth of innovations; the network economy creates prerequisites for constant changes in the organization of the system[11].

The birth of the network economy was facilitated by large-scale changes in economic processes caused by the use of ICT, the possibility of transmitting huge amounts of information, audio and video materials on the global market. In addition, the widespread use of ICT has caused economic and social changes at the international, macro and micro levels. In particular, this made it possible to: reduce the transaction costs of companies; increase the transparency of the markets - both buyers and sellers can compare the offered prices with the prices of competitors; reduce barriers to market entry and reduce the importance of the spatial and temporal factors for doing business; strengthen the global nature of the economy. It is these factors that distinguish economic networks from industrial ones.

5. Economy of knowledge. In the knowledge economy, there is a significant increase in the role of man, in which he becomes not just a subject of reproductive work with elements of creativity, but directly a subject of creative work. The main source of capital creation of this economic model is the intellectual rent obtained as a result of the use of intellectual capital. In addition to intellectual capital, in the knowledge economy there is structural capital, which differs from human capital in that it is the property of the organization and can be in the form of trademarks, business processes, that is, elements that ensure employee productivity. From our point of view, the knowledge economy is the result of the development of all analyzed economies and a transitional link to the formation and development of a new economy. Thus, the new paradigm of economic theory, which aims to study the patterns of the formation and development of the knowledge economy, must integrate conceptual developments in all theoretical directions of its research. The knowledge economy is aimed at combining science, innovation and business processes, which ensures leadership and competitiveness of the economy while reducing resource consumption. In turn, the knowledge economy is based on human capital and knowledge, high technologies and high-quality services [12].

It is important to note that the category of «knowledge» has always been of interest to researchers - representatives of economic science. They interpreted knowledge primarily in connection with the process of reproduction. Thus, A. Smith first indicated the role of

knowledge in some types of activities in the doctrine of division of labor, suggesting that in some professions the division of labor is stronger than in others, others require only highly specialized skills, while others require a wider or more general set of skills. At the same time, K. Marx considered the category of «knowledge» in connection with the reproduction of fixed capital. He believed that «the development of fixed capital is an indicator of the extent to which social knowledge is transformed into a direct productive force, and hence - an indicator of the extent to which the conditions of the social life process itself are subject to the control of the general intelligence and are transformed in accordance with it. In this case, he attached great importance to «general public knowledge» as a direct productive force of society. The American scientist K. Menger considered knowledge about the effective use of production factors and resources to be the most important factor in economic progress. A. Marshall expressed the opinion that «a significant part of capital consists of knowledge and organization. Knowledge is the most powerful engine of production. He considered knowledge as a necessary factor in the implementation of entrepreneurial activity, which ensures the acceleration of changes «that constructively mature in society, investigated the importance of «technological improvements» and «new inventions» for the expansion and improvement of production efficiency [27].

In 1945, Friedrich von Hayek suggested considering the impact of new knowledge on economic and production processes, and in 1957, A. Downson, based on Hayek's works, developed a classification of new knowledge. It should be noted that F. Hayek and J. Schumpeter, representatives of the Austrian economic school, took into account the importance of using new knowledge in economic processes. The outstanding economist G. Simon [102] also considered knowledge as a necessary condition and driving force of economic development. S. Kuznets emphasized that the growth of the baggage of useful knowledge and the expansion of the spheres of their application constitute the essence of modern economic growth. According to academician V. Makarov, «production of knowledge is a source of economic growth.

Already in the mid-70s of the 20th century, P. Drucker defined knowledge as the main resource that distinguishes business and gives it decisive competitive advantages. E.

Toffler also believes that knowledge has a powerful creative potential and taking into account the trends, namely the struggle for the possession of information, it can completely replace material resources [28].

It is safe to say that by the 1980s, two main approaches to assessing the role of knowledge in the economy had developed in world economic thought. The first of them reflects the attempts of neoclassical economics to incorporate technological knowledge, which is generated through research activities, into the analysis of economic equilibrium. The second approach is based on the teachings of J. Schumpeter and highlights knowledge as a learning process, incorporating a set of abilities and competencies that contribute to economic changes.

The analysis of the evolution of the category «knowledge» shows that at the first stages of the development of economic thought, the object of research was a person and his personal knowledge. The subject of research was the accumulation of knowledge through education, its distribution and practical use. The role of knowledge as a factor of production grows significantly over time, and since the middle of the 20th century, knowledge has turned into the main driving force of socio-economic development, and the object of research is knowledge in the system of industrial relations, the subject of research is obtaining benefits from the use of knowledge and its transformation from intellectual to financial capital. Today, knowledge is not only the main value of any sector of the economy, but also the main resource that provides a strong competitive advantage to business entities at the micro- and global level [29].

The use of scientific knowledge as an independent economic resource is the most essential for characterizing the post-industrial society. Having analyzed the definition, it can be argued that knowledge is the result of the display of information (data) of an intellectual entity in time and context, which belong to it in the form of certain individual context-dependent information images. Another aspect that is paid attention to when discovering the nature of knowledge is its connection with a person during cognitive and intellectual activity. Previously, this aspect was studied by philosophers and psychologists. Domestic philosophical science defines knowledge as «the result of knowledge of reality

verified by practice, its correct reflection in human thinking. This approach to knowledge is interpreted as the result of individual cognitive activity, inextricably linked with human intelligence. At the same time, information is defined as the exchange of signals, the transfer of information, exists both in living and inanimate nature, that is, it can have an individual-independent character. That is why, in our opinion, knowledge plays the following role in the knowledge economy :

- in parallel with labor and capital contribute to economic growth - the resource concept of knowledge;
- production of knowledge is evaluated as a quality that determines the appearance of the economy - a productive concept of knowledge;
- codified knowledge turns into the main component of economic relations - a codified concept of knowledge; the development of knowledge is built on the basis of information and communication tools - a concept that regulates the development of the information society [30].

Based on the approaches presented by NV Kazakov, we offer some systematization of the definition of knowledge (Table 1.4), where A - knowledge and information are emphasized on the communication aspect and the need to transfer them; B – knowledge and information are determined by the degree of organization and interpretation of data; C – the connection of knowledge with human consciousness, intellectual activity, reflection and understanding of the surrounding reality is emphasized; D – the connection of knowledge with a specific individual, personality is noted; E - the inseparability of knowledge and information from the social, technological and other context is highlighted.

Table 1.4

Classification of the definition of knowledge

The authorss	A	B	C	D	E
M. Polonia (1958)			+	+	
F. Makhlop (1962)	+				
J. Bell (1970)	+		+		
M. Pora (1997)	+				
Philosophers (2000 th)					+
K. Wiing (2003)		+	+		
R. Nelson, P. Romer (2006)			+		
T. Steward (2007)		+			

J. Hodgson (2010)		+			
T. Nikolaeva (2011)	+		+	+	
B. Milner (2013)		+			
T. Gavrilova, V. Khoroshevskiy (2014)			+		
V. Labotsky (2016)	+		+		
V. Dresvyannikov (2020)	+	+		+	
T. Andreeva, T. Gutnikova (2021)			+	+	

Source: created by the authors based on [31]

Such data show that researchers of the nature and role of knowledge and information do not adhere to any one approach, which is completely justified, because only by combining different approaches can the main properties of knowledge and information affecting the processes of their production, distribution and application be revealed. Emphasis on one aspect limits the understanding of these phenomena and narrows the possibility of managing them.

It is also important to note that, according to experts, there is currently no universally recognized knowledge classification system. Along with this, it is possible to identify a number of established approaches used both in the scientific literature and in the practice of knowledge management. Knowledge has been a subject of scientific interest since historical times. One of the earliest classifications of knowledge belongs to Aristotle, who singled out the following types of knowledge: knowledge as theoretical and universal (know-why), knowledge as a technology of activity based on practice and in a specific context (know-how, «I know how»), knowledge as a norm of activity based on life experience and a specific context («practical wisdom», common sense) (Table 1.5). M. Polanyi introduced the concept of «indirect» knowledge: «We may know more than we can say. It is assumed that knowledge has a personal character, it is tied to the context, so it is difficult to translate it into a clear form to convey to others. Explicit or codified knowledge refers to knowledge that can be transformed into officially recognized, systematic language.

Table 1.5

Classification of knowledge

A sign of classification	The content of the sign	Authors, year
By its content	1) know – why (I know why) 2) know – what 3) know – how (I know how) 4) know – who (I know who)	Aristotle (3rd century BC)
By character	Knowledge of goals systematic knowledge practical knowledge automatic knowledge	E. Brooking (2001)
By affiliation	Personal, collective	M. Polone (1966)
By the form of manifestation	Explicit, implicit	I. Nonaka, H. Takechi (1995)
According to the method of formation	Reflective, intuitive	Guni V., Ustinov V., Baranche S., Lyapin S. (2020)

Source: compiled by the authors based on [32]

Therefore, knowledge affects economic results in the following way:

- first, knowledge, creating added value, is the basis of any production process, since the simplest form of production requires special knowledge;
- secondly, knowledge, embodied in capital, ensures an increase in the efficiency of production and management processes, increasing labor productivity and reducing costs;
- thirdly, the competence of employees, supported by knowledge, ensures the normal course of the production process, since the correspondence between the technological level of production and the quality of employees is necessary;
- fourthly, knowledge is the basis for improving existing and creating new products and services that contribute to the expansion of existing markets and the formation of new ones [33].

On the basis of the conducted analysis of knowledge economy, we offer the following system of correlation of these categories: the basic concept is the theory of post-industrial society; all the following theories are the concept of the post-industrial economy using one of the features as a key element of the economy (Fig. 1.1). The first concept is the theory of the service economy, transformed into the information economy. The theory of the information economy, on the one hand, has developed into an innovative economy due to the synthesis from the theories of human capital. On the other hand, into the digital economy as a result of the digital revolution. The network economy contains all these theories. The concept of the post-industrial economy is primarily a theoretical model, the purpose of which was to predict possible options for the development of a new economy formed at the beginning of the XXI century, which is based on the real state of the economy of developed countries. The fifth change in the technological structure, based on the sixth information revolution, became the impetus for the search by theorists and practitioners for a new ideology, a paradigm for the formation of world civilization, which they began to interpret as an information society, a knowledge economy, a post-industrial economy, an infosphere, a programmed society, a society of professionals. The new ideology, the new economy must be based on a methodological approach, taking into account two fundamentally different components compared to the previous epistemological achievement. The first component is the recognition in the cognitive object of an active, conscious beginning, which already possesses information to some extent and has at its disposal a set of psychological properties adequate to the modern economic society, which allows the latter to respond to a changing competitive environment. The second component (it should be noted that economists ignored it until recently) is the recognition of properties and goals in people that go beyond the narrow utilitarian boundaries by which economists traditionally distinguish their analytical constructions, and the inclusion of active reflexive models first in cognitive activity, and then and in management decisions.

The term «new economy» has been actively used since the early 2000s. The first attempts to explain the phenomenon of the new economy appeared in 1976 in the works of M. Porat and M. Rubin, employees of the American Stanford Center, in which a significant and intensively

growing sector of the information economy was singled out and a system of basic concepts and the basis of the methodology for studying the influence of the information sector were developed to other sectors of the economy. According to the first approach, the «new economy» is understood as a complex of knowledge-intensive industries engaged in the production and provision of services of information and communication equipment, the creation and distribution of software products, the development of communication networks, as well as the entire system of forming, storing, distributing and receiving information on the Internet. According to this approach, the «new economy» includes all business activities that use modern electronic information and communication technologies[13]. The second approach includes in the concept of «new economy» organizational and institutional innovations in the activities of various (in particular, traditional) branches of the economy of developed countries. This definition is presented in the concept of the Council of Economic Advisers to the President of the United States, according to which the American economy of the last decade of the 20th century is generally characterized as a «new economy» in connection with the extraordinary growth of its indicators, which was the result of the combined effect of the interaction of achievements in technology, business practice and economic policy.

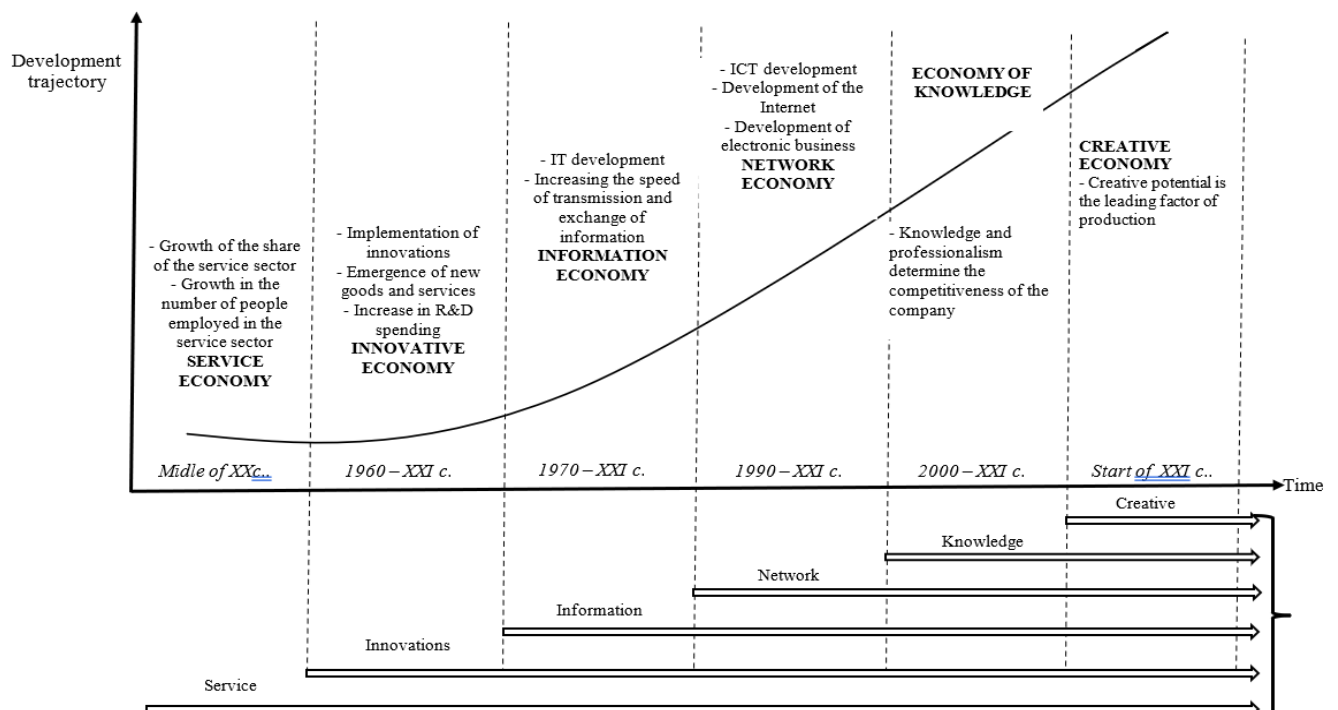


Fig. 1.1 Evolution of the development of the new economy

Source : built by the authors based on [31], [32], [33]

Proponents of the third approach pay attention to the financial component of the «new economy». This approach defines the concept as one of the peaks of the international financial economy, a financial business model that symbolizes the wide use of the tools of information and technological innovations in the monetary and financial system. Within the framework of the listed approaches, researchers are aware of important elements of the new economic reality created by information technologies at both the sectoral and national levels. However, the mentioned interpretations of the «new economy» do not sufficiently reveal the dynamics of the modern stage of social progress.

The fourth approach considers the «new economy» as a set of industries characterized by a greater share of human capital compared to material elements. In these industries, the technological implementation of knowledge plays a crucial role, and the production of knowledge is a source of economic growth. In this interpretation, the concept includes the sphere of education, information and communication markets, production of innovations, provision of intellectual services (consulting, information mediation, analytics, marketing) (appendix A).

In the new economy, there are two subspaces that determine different types of activity of subjects of economic relations: material (includes the real processes of creation, distribution and consumption of resources) and informational (is the result of an information display of the material space, includes the processes of forming an information model of the environment and composition (synthesis), and on its basis - a new way of material space). It is appropriate to single out the factors that caused the emergence and development of the new economy, in particular the globalization of the economy, which is characterized by the development of free trade and liberalization of markets, increased capital mobility, lower taxes on the profits of enterprises, the ease of moving industries between states to reduce labor and natural resource costs; creation and distribution of networks, general informatization; creation of new forms of employment and payment, work through a system of remote offices; distribution of skilled and intellectual labor; rapid development of

technologies and equipment. The most important factor in the existence of the new economy is knowledge, which becomes an independent factor of production. The peculiarity of this factor is belonging to intangible, inexhaustible and non-scarce resources [14].

Having analyzed the above, it can be concluded that the «new economy» is characterized by the following features: knowledge forms the greater part of the added value; knowledge, innovation and creativity are economic categories; work with knowledge is allocated to a separate field of activity; communications play a significant role and are allocated to a separate branch of the economy; the hierarchical management system is transformed into complex network structures.

1.2. Imperatives of the formation of the knowledge economy

In the last decade of the 20th century, a paradigm shift in social development took place. The factor of human progress has turned into a condition, goal and driving force of development. The main problem in the study of factors of economic growth has shifted from statistical analysis of quantitative variables to qualitative analysis. In this regard, the concept of «knowledge economy» has gained considerable popularity and is a set of economic relations based on the integration of scientific, industrial and educational components.

The modern economy is in a new qualitative state associated with a change in economic conditions caused by: the introduction of new, high-level technologies in production, the expansion of the information space, the mobility of capital, the increased importance of creative, creative work, and the growth of the role of theoretical knowledge. A type of economy in which knowledge and information become the main factors of production can be defined as a knowledge economy. In theoretical and practical aspects, as a whole concept, the knowledge economy develops dynamically and, depending on the changes occurring in political and economic processes, acquires certain features and characteristics. Elements of the knowledge economy are historically present in all socio-economic formations and civilizations, but only in the conditions of globalization do they manifest

themselves most clearly. Knowledge can become the main driving force of social production only in conditions of radical reduction of the role of physical and routine work, simultaneous development and use of mental activity, mass informatization and intellectualization of social life, which is characteristic of the modern stage of development of the economic system of mankind. The human brain as a generator, accumulator and transformer of knowledge is the main object of cognitive technologies and the subject of interdisciplinary neuroscience [15].

It is important to note that the economy belongs to the resource economic theory, which is the most modern among other economic concepts (the stages of the evolution of theories of the knowledge economy are given in table 1.6). The subject of study of each of them is certain and quite important features of the firm's activity: production (neoclassical theory), transactions (theory of transaction costs), innovations (theory of evolutionary economics), resources (resource theory). From the point of view of resource theory, a firm is more than an administrative unit. It is a set of productive resources distributed among different users with the help of administrative and economic decisions. Cultivating resources in a competent company means constant search, acquisition, production, development and obtaining economic rent from the effective use of resources, the most important of which are human capital and intangible assets. The organization in its activities has always relied on the knowledge of what to do and how to do it, taking it for granted.

Table 1.6

Stages of evolution of theories of knowledge economy

The authors of the concept	Year	The essence of the concept
Predecessors of the theory of knowledge economy		
Hayek F.	1945	Analysis of new knowledge as a factor contributing to significant time savings in the production process
Dawson A.	1957	Creation of the first classification of knowledge
Sheller M.	1962	The theory of purposeful acquisition of new knowledge
Makhlup F.	1966	The main provisions of the theory of production and dissemination of knowledge, monitoring the state of production and dissemination of knowledge in the USA
Polanyi M.	1985	Introduction of the concepts of «explicit» and «implicit» knowledge

Drucker P.	1975	Creating a theory of knowledge management
Fukuyama F.	1992	Formation of social capital in the knowledge economy
The initial stage of formation of the theory of knowledge economy		
Nonaka I.	1994	Creating a theory of knowledge transformation
Dretske P.	1995	Development of the theory of knowledge management
Toffler E.	1999	The concept of the impact of new knowledge on value orientations and norms of individual behavior in society
Bell D.	1999	The concept of the influence of knowledge on economic rationality. Concept of economic growth based on theoretical knowledge
Shultz T.	2000	Economic evaluation of the rational behavior of an individual taking into account the level of his competencies and potential
Makarov V.	2003	Formation of approaches to the assessment of the cost of transformation and use of new knowledge
Kleiner G.	2004	Socio-economic aspects of the knowledge economy
Milner B.	2004	The issue of knowledge management in the CIS
Glukhov V.	2005	Evaluation of the efficiency of the production of new knowledge
Makhlup F.	2006	Production and dissemination of new knowledge in the USA
The modern stage of forming a holistic concept of the knowledge economy		
Makarov V., Kleiner G.	2007	Development of the theory of microeconomics of knowledge
Timina E.	2009	Knowledge as a factor of economic development
Dagaev A.	2010	Economy of knowledge in the information society
Logachov V.	2011	The relationship between the innovation economy and the knowledge economy is obvious: both use intellectual labor as tools to achieve their goals
Campbell	2015	Introduction of the concept of «creativity economy», which is based on the interaction of creativity, knowledge and innovation
Frolov D.	2016	The concrete-historical form of the evolution of the post-industrial economy, which is expressed in a structural shift to increase the share of knowledge and creative industries in the GDP structure of leading countries
Mikael G.	2018	Knowledge as a result of mental work is transferred to society in the form of new technical devices and technologies
Rutkevich M., Levashov V.	2020	Technological determinism is being overcome in theories of economic growth and development

Source: created by the authors based on [14].

The growing economic weight of knowledge, its importance and place in competition have increased its role in society. Companies are aware of the interest in knowledge management and therefore begin to increase investments in its creation, preservation, and use in the same way as they have traditionally increased, preserved, and used their other resources. And even more so, because knowledge is perceived as the most important strategic resource in ensuring competitive advantages. The efficiency of production

innovation is the main field of application of knowledge, which is achieved due to new approaches, methods and technologies in ensuring the growth of production volumes and cost reduction. Innovations ensure the creation of new products, goods and services, business processes and enterprises. Patents and copyright certificates, trademarks, information about the professional qualities of employees, information about the client base, networks of loyal suppliers, partners and consumers, etc., bring real dividends to companies.

From a theoretical and practical point of view, it is very important, in our opinion, to consider the knowledge economy as a result of the evolution of neoclassical and post-Schumpeterian concepts and models of economic growth in modern conditions. If this theory is perceived from a branch perspective, namely as a theory of economic relations in the educational and scientific and technical spheres, then there is a danger of its inadequate practical use.

The synthesis of different approaches to the definition of the knowledge economy allows us to consider it as an institutional model of a modern economic system of the innovative type, based on the priority of intellectual property, creative work, knowledge-intensive production, continuous education and the growth of needs for self-realization. The knowledge economy is the newest stage of the institutional evolution of capitalism. For a more detailed understanding of the features of the knowledge economy, it is advisable to analyze the interpretation of the term «knowledge economy» by both domestic and foreign scientists . It is important to note that during the entire period of development of the theory of the knowledge economy there was a need to analyze the difference between the terms «economy based on knowledge» and «knowledge economy». In a knowledge-based economy, higher initial capital investments are required to reproduce a complex intellectual product. However, after the initial stage is completed, the cost of each additional unit of production will be minimal or even heading towards zero, that is, it will be free. The result of this is the fact that the material return decreases. After all, each additional unit of resource (product) is created with greater effort than the previous one, and is more scarce and expensive in terms of production costs. In the knowledge economy,

the return, on the contrary, is increasing. This is due to the most important difference between knowledge and material objects, which is that knowledge and ideas are inexhaustible, and therefore the law of diminishing returns cannot be applied to them.

Knowledge thus provides increasing returns as it is used. The more we consume them, spend them, the more their value increases, which ensures a kind of multiplicative cycle. In an industrial economy of diminishing returns, there are equilibrium prices, and the policy of the state is to allocate scarce (limited) resources among competing producers and consumers. This means that the purpose of regulating the economy of material production is to create an environment and conditions conducive to efficient production .

In the knowledge economy, where the main tasks are the production and dissemination of knowledge and ideas, the classical concept of the equilibrium price is nullified. In it, there is always a contradiction between the desire to have low prices after acquiring knowledge so that it can be replicated and widely distributed, and the desire to promise in advance reliable protection of intellectual property rights and a monopoly position to create an incentive and motivation for discovery. All this transforms the role of the state, which consists in creating institutional conditions and incentives that contribute to the generation of ideas and innovations. The difference between the post-industrial economy and the knowledge economy is shown in Appendix B. When considering the specific features of the knowledge economy, it is advisable to pay attention to the types of infrastructure of the knowledge economy, which should be divided into industrial, commercial, social, political, territorial and informational.

- post-industrial economy, as there is an increase in the share of the service sector, which replaces the production sector in terms of its importance;
- information economy, since information (knowledge, science) plays a decisive role;
- an innovative economy, since an economy in which knowledge enables the generation of a continuous flow of innovations that meet dynamically changing needs, and often shape these needs, can be considered innovative;

- the network economy, since in the knowledge economy the interaction between knowledge carriers is mediated by wide network connections (the emergence of the Internet as a new infrastructure of the economy greatly simplifies remote contacts)[18].

We clarified the essential characteristics of the concept of «knowledge economy», in particular, it is the result of the evolution of the post-industrial economy in the form of an innovative model of production with the use of information and communication technologies, human capital and the creative potential of companies with the participation of social networks, which complement and in some cases replace traditional types of market organization. According to this approach, the knowledge economy is a synthesis of fundamental characteristics and various theories of economic development. Based on the research of leading scientists, various theories of the knowledge economy can be classified as follows:

- theories of neo-economics as a knowledge economy: the noosphere theory of VI Vernadskyi, integral society PI Sorokina, Yu.A. Yakovtseva;
- theories of information and global network economy: theory of post-industrial society by D. Bell, J. Galbraith, E. Toffler;
- theories of the new economy as an economy of increased demand for innovation as realized knowledge;
- the new economy as a system of organizational and institutional innovations in the activities of various industries;
- the new economy as a complex of science-intensive production and service industries;
- the new economy as a financial model of the economy, based on their wide use in the monetary and financial sphere [19].

It is necessary to mention the matrix of initial data for determining the influence of the components of the knowledge economy on the competitiveness of the countries of the world according to the rating of the global assessment of competitiveness (Appendix C), Matrix of raw data for determining the impact of the Knowledge Economy Index on the index of competitiveness of the countries of the world (Appendix D and the)source data

matrix for determining the impact of the knowledge economy on the competitiveness of the countries of the world according to the KEI according to the EBRD version 2020 Europe (Appendix E) that have great influence on the formation of the knowledge economy.

The state of the modern world is characterized by globalization of all socio-economic and socio-political processes, transformation of value systems and views, oversaturation of information space and communication systems. Today, it is possible to assert the formation and approval of a new creatological formation, a special cultural and creative space that includes such relatively independent spheres and autonomous worlds as creatogenic society, creative economy, total art and universal creative personality. In a narrow sense, the concept of «creativity» is a procedural factor of an individual's creative activity, as a result of which an innovative labor product is created on the market of goods and services. At the same time, an innovative labor product is understood not only as a product or service, but also as new research methods, concepts, a decision-making algorithm, etc [20].

Even at the end of the 20th century, C. Landry and F. Bianchini argued that «the industry of the twenty-first century will increasingly depend on the generation of knowledge created with the help of creativity and innovation.» According to J. Hawkins, in the modern creative economy, creative ideas, patents, copyrights, trademarks and original developments have a decisive influence on the growth and development of the most successful companies in the world. Modern researchers come to the opinion that in the new creative economy it is creativity, innovation and the generation of new ideas that are important corporate capital, the main resource and factor of production. Creative work is a complex process in terms of content, which, on the one hand, is continuous, and on the other, it is characterized by both ups and downs, as well as stagnation and decline. The knowledge, experience and creativity of the staff become the main factor of the organization's effectiveness, without which scientific progress is an unattainable task that does not depend on the amount of funds invested in production equipment and technology.

One of the main tools of the knowledge economy is the functioning of the global knowledge market. The market is a system of economic relations based on exchange relations, that is, on the payment and price of purchased goods and services. It can be argued that the knowledge market is a set of economic relations that are established between producers and sellers of knowledge, affecting their supply, and buyers (consumers) of these goods and services, which form the demand for them through the purchase and sale of the latter. In our opinion, the market of knowledge and its exchange is a new market that can be classified according to several features, including:

- subjective belonging of knowledge: global knowledge market; knowledge market of national importance; market of corporate knowledge; the market of knowledge of individual individuals;
- the nature of the purpose of knowledge: scientific (fundamental and applied); ordinary; entertainment and leisure; moral and ethical;
- by fields of knowledge: knowledge market segments in the field of economics, humanities, natural sciences, etc.;
- by the form of manifestation: market segments of explicit and implicit, codified and non-codified knowledge;
- by the way of formation: knowledge market segments formed on the basis of already existing knowledge, and knowledge generated independently by specialists on the basis of relatively little explicit (codified) knowledge;
- by the form of use: segments of the knowledge market alienated from the carrier (human) and non-alienable knowledge;
- forms of selling knowledge, etc [25].

It is also important to note that the knowledge market as an institution is significantly different from traditional markets, as it is represented by the following components: knowledge ownership institutions (copyright and patent law, laws protecting intellectual property); the actual market (knowledge, services, labor, rights; market platforms, in particular the exchange of technological companies, peculiarities of pricing); innovative

managers; consulting companies; judicial system (execution of contracts); incubators, innovation zones, technological parks, exhibitions.

As you know, according to the economic purpose of the objects of market relations, the following are distinguished: the commodity market, the resource market, and the financial market. We are used to perceiving these markets as separate elements of the market system. In fact, they are coherent. And an example of this is the market of knowledge, which permeates the entire system of markets: the commodity market as a good, the resource market as a resource, and the financial market as an intangible asset. The market of knowledge is a connecting link that unites the system into a single whole, the specificity of which is expressed in the following.

First, this market is the most open compared to other types of markets in the single market system. Knowledge transfer can be carried out using information and telecommunication technologies practically in real time. This, on the one hand, creates enormous opportunities for the development of the knowledge market, and on the other hand, creates the problem of paid creation, distribution, replication and use of knowledge. Secondly, knowledge assessment is characterized by multivariation. That is, from the position of the producer and the seller, knowledge as a product is evaluated at the time of sale, and the buyer (consumer) - with regard to the long-term perspective (for example, educational services, acquisition of patents, licenses, etc.). The importance of knowledge as a resource is growing rapidly, and its volume is increasing at such a speed that the knowledge market already has various organizational forms: a network of centers for the translation of various knowledge (inventions, discoveries, textbooks, etc.) into electronic form (content); creation of digital repositories; technology transfer; creation of «knowledge cities» and «knowledge regions» that possess developed intellectual resources and are the main market players; knowledge auctions, knowledge exchanges; purchase or rental of specialists, provision of consulting services, in particular in real time; outsourcing. From our point of view, this is a form of relationship in the economy between those who produce and sell knowledge that affects the supply, and those who buy it, that is, consumers

of this knowledge, who form the demand for their goods through the process of buying and selling [26].

The importance of knowledge as a resource is constantly growing, and its volume is increasing even faster. The newly created knowledge market has the most diverse forms of organization: centers are engaged in the translation of various new knowledge - inventions, developments, discoveries, manuals, textbooks, etc. - into electronic form: content, creation of special digital data repositories, implementation of technology transfer, creation of so-called knowledge cities and regions, which have powerful intellectual resources and are the main participants of such a market; auctions and knowledge exchanges; purchase or rental of specialists, provision of consulting services; transfer of company functions to independent contractors. The knowledge market contributes to the continuous and constant development of knowledge, as it can become morally obsolete very quickly, and therefore requires constant updating to a higher level that meets the needs of the consumer. The market of knowledge forms in consumers the same attitude to knowledge as to any other product, and the understanding that the knowledge economy is an economy where knowledge is a commodity. The set of basic elements of the knowledge market is given in table 1.7.

Table 1.7

Basic elements of the knowledge market

Basic elements	Areas of increasing knowledge
Data	Sign systems, material carriers, semantic loads
Information	Types, access modes, structuring methods, information technologies, information space
Information market	Sectors, ways of functioning and access
Knowledge	Types, sources, carriers, stages of development, forms of storage, methods of replenishment, methods of structuring, prerequisites and methods of creating new knowledge, philosophy and forms of use
Market of knowledge	Manufacturers, sellers, buyers
The main carrier of knowledge	Person, personnel, intellectual potential, intellectual capital, corporate memory, organizational culture, management function, organizational knowledge
Ideas generation technologies	Collective, informational, creative (subject area, methodological support, expert evaluations)
Intellectual assets	Classification, control subsystems

Information and intellectual resources	Classification, sources of formation, factors of use
Intelligent products	Products of industrial property, know-how, copyright
Intangible assets	Economic essence, objects, intellectual property and its varieties, legal support, economic operations
Knowledge management system	System requirements, system elements, tools, organizational structures, performance characteristics
Competitive business strategy	Factors of using the level of competencies, routine and creative tasks, the impact of new technologies on the organization, stages of innovative activity, creative people and organizations, network interaction

Source: created by the authors [26]

The main participants of the knowledge market are buyers, brokers and sellers of knowledge. Buyers (seekers) of knowledge are specialists or organizations that try to solve problems, the complexity and uncertainty of which are higher than their a priori knowledge. Buyers of knowledge are looking for intuitive approaches, assessments, understanding of a problem because such information is of exceptional value to them. The acquired knowledge will allow to find the necessary solution to the problem, increase the efficiency of the activities of specialists, groups, teams, managers of one or another level. Sellers of knowledge are, as a rule, specialists (experts) with a high reputation in the domestic market, who possess significant resources of knowledge on certain problems and topics. Among them there are those who have qualifications, but are not able to clearly express their knowledge in a clear, marketable form. Others have deep, but highly specialized knowledge of a specific field of application, which significantly reduces their value on the knowledge market. There are also those who consider it necessary to keep their implicit (hidden) knowledge to themselves. Such an opinion in some cases has certain grounds. If knowledge is power, then the owner of knowledge can lose this power if other specialists master his knowledge. Of course, this is not in his interests. One strategy of smart market behavior for knowledge sellers is to ensure that the sale of knowledge is rewarded more than its hidden accumulation. Knowledge brokers act as a link between those who need knowledge and those who have it, that is, between buyers and sellers. Their tasks are to investigate organizations, find out the competencies and specialization of

employees, their subject area and level of knowledge. That is, these specialists have information, to whom and for what problems they can turn to in search of missing knowledge. Some informal knowledge brokers are essentially knowledge hunters. They deliberately become experts in the dislocation of knowledge in the organization and very often «sell» this knowledge and experience not for money, but for reputation, thereby serving the internal knowledge market [27].

Knowledge becomes a decisive economic resource on the basis of the following patterns of development of productive forces in the scientific and technological era: first, due to the replacement of natural resources with man-made resources; secondly, due to labor savings, its mechanization and automation: replacing workers with machines leads to labor savings, since the use of machines is, as a rule, more productive than non-mechanized labor; thirdly, due to the saving of physical capital: replacing less productive machines with more productive ones, and their, in turn, with high-tech equipment helps to save not only labor, but also investments, since each subsequent, more technological unit of physical capital is more efficient and more productive; fourth, due to the replacement of natural, material and labor components of production with intellectual ones (high technologies, computer support, etc.).

The market of knowledge is the most open compared to other types of markets in the single market system. Knowledge transfer can be carried out using information and telecommunication technologies practically in real time. This, on the one hand, creates great opportunities for the development of the knowledge market, and, on the other hand, creates the problem of paid creation, distribution, replication and use of knowledge. In addition, there is a multivariate knowledge assessment. That is, from the point of view of the producer and the seller, knowledge as a product is evaluated at the time of sale, and the buyer (consumer) evaluates it with a view to the long-term perspective (for example, educational services, acquisition of patents, licenses, etc.). Knowledge is the basis of any production, since even the simplest form of production requires special knowledge. The importance of knowledge (intellectual capital) cannot be underestimated even for previous post-industrial economic eras. In the pre-industrial and industrial eras, the creation of

material capital and the product of production was preceded by the production and generation of knowledge. But in the post-industrial economy, the central role of theoretical knowledge, the predominance of theory over empiricism, and the codification of knowledge into abstract systems of symbols that can be preserved and transmitted in various ways became decisive.

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Summarizing the above, it can be argued that the process of the country's development is closely related to knowledge and creativity, and it would be wrong to evaluate economic growth only from the standpoint of the contribution of the industries' added value. Today, it is possible to win or compete in a competitive struggle, to achieve sustainable economic development by targeted investments in knowledge, that is, in science and education. All this forms a civilized society. Experience shows that countries that do not invest in education and science cannot adequately compete on the market and achieve sustainable

socio-economic development. In this case, there is no doubt that poverty and backwardness flourish in these countries, there is a constant threat of economic and social threats, foreign invasion. In addition, changes taking place in the world, as well as scientific and technological discoveries, the speed of which is 2-3 years, force each of the countries of the world to implement a more flexible policy in the field of science, education and innovation.

Summarizing the above, we can conclude that radical changes are taking place in modern society, leading to the dominance of knowledge as a factor of social development. At the beginning of the 21st century, it must be said that knowledge is becoming a decisive economic resource based on the following patterns of development of productive forces in the scientific and technological era: first, due to the replacement of natural resources with man-made resources; secondly, due to the saving of labor, its mechanization and automation: the replacement of working machines leads to labor savings, since machines, as a rule, are more productive than non-mechanized labor; thirdly, due to the saving of physical capital: replacing less productive machines with more productive ones, and replacing them with high-tech equipment leads to saving not only labor, but also investments, since each subsequent, more technological unit of material capital is more efficient and productive; fourth, due to the replacement of natural, material and labor components of production with intellectual ones (high technologies, computer support, etc.

1.3. Corporate globalization of knowledge: the phenomenon of transformational change

The last decade was marked by significant changes in the world economic system. The economic interaction of the subjects of the world economy has increased, characterized by the liberalization of national and global financial markets and a significant increase in cross-border movement of capital. The world economic space is turning into a «cosmopolis» global economy, where the pronounced interdependence of all financial entities within a single whole can be traced. Under such conditions, transnational

corporations (TNCs) become the main players that exert a significant influence on the development of the world community, because the current stage of the development of the world economy is characterized by the formation of a global model of economic development. Economic globalization is a qualitatively new stage in the evolutionary development of economic life, the character of which is manifested in the internationalization of production and scientific and technical progress based on TNCs, their numerous connections and alliances, and the modern information revolution, which is accompanied by the formation of a global network of international financial markets. It is important to note that the intensification of global competition, the activities of international corporations, global financial organizations, and purposeful protectionist measures of the leading states of the «golden billion» determine the need to take into account the features of the global environment as a factor in the formation and development of TNCs, which, in turn, is of great significance for improving the mechanism interaction of national economies.

A transnational corporation, on the one hand, means a form of international business organization in new conditions based on obtaining and implementing global competitive advantages due to the international expansion of its activities as a result of the globalization process. Therefore, TNCs are an object and a new product of globalization, that is, TNCs owe their emergence to globalization processes. On the other hand, the set of transnational corporations, as they develop on a global scale, becomes an independent and main subsystem, an institution that catalyzes the processes of globalization and international capital outflow. Thus, TNC is a subject of economic globalization (at the same time national and global), which ensures socio-economic development of national and world economies. Therefore, appearing as a result of globalization, TNCs began to manage this process and accelerate it in order to maximize their own economic interests. In the context of the analysis of the criteria for the transnationalization of corporations, it is appropriate to determine the evolution of the development of TNCs, which is shown in the table. 2.1

Table 2.1

Evolution of transnational corporations

Periodization	Generation	Characteristic
1870-1914 The era of colonies	<i>Colonial raw materials corporations</i>	The first generations of international corporations (cartels and syndicates) were mainly engaged in the extraction of raw materials in the colonies and their processing in the host country. Industrial innovations were implemented in machine building, mining and chemical industries
1918–1939 The era of Concessions	<i>Military-industrial corporations</i>	During the period of turbulence in the world economy, corporations mainly developed under state control, which contributed to the expansion of the scope of their activities on world markets. They were mainly created in the form of trusts, involving national enterprises in their structure.
1945–1971 Information revolution	<i>Scientific and technological</i>	Post-war corporations were focused on constant technical updating of the production of goods and services. Concerns and conglomerates focused on using the advantages of international production cooperation became the main forms of organization. The period was accompanied by the unprecedented hegemony of American TNCs
1971–1989 The era of mergers and acquisitions	<i>Innovative corporations</i>	The computer revolution gave rise to TNCs focused exclusively on R&D. As a result, information technologies have become the main object of international investments. Vertically integrated corporations became the main organizational structure during this period
1989–2008 Post-socialist transformation	<i>Global Cyber corporations</i>	Relying on science and innovation, as well as access to new markets, became the growth engines of TNCs. Network structures of global companies are developing, focused on the active use of cyberspace
Since 2010 The era of the global opposition	<i>Global planetary corporations</i>	International corporations of the sixth generation are formed through mergers and acquisitions or on the basis of national financial and industrial groups, reaching incredible sizes. However, the presence of several centers of power in the world complicates the development of some TNCs. In this connection, there is a deepening and expansion of regional economic integration, which opens prospects primarily for continental corporations. For the first time, attempts were made to create a special court to hear disputes between corporations and national governments. The economic confrontation is entering the most acute phase of its development

Source: created by the authors based on [35]

Important in various periods of TNC development is the concept of activity efficiency, which is given in table 2.2. In the researched theories of the effectiveness of transnational corporations, attention is paid to the absolutely versatile activity of TNCs, which is due to the complexity and multifaceted nature of the studied phenomena. Most researchers emphasize the monopolistic nature of the activities of the studied companies, which forms their advantages over competitors.

The first model is the traditional model, which involves creating goods in the country of origin and then exporting them abroad. The second model is related to the rational territorial location of production, the transfer of developments to countries where the conditions for their implementation and implementation are better, and production is much cheaper. Today, the majority of transnational corporations adhere to such a model of behavior that requires studying the formation of interaction and mutual relations of economic agents both within the TNC and with other business entities. Among supporters of the same approaches to the study of TNC activities, there is a significant difference of opinion on the problem related to the specifics of their formation and development, which is due to the extreme complexity and multifaceted nature of the phenomenon under consideration. Almost all researchers emphasize the monopolistic nature of transnational corporations, as well as the existence of specific competitive advantages in TNCs, obtained on the basis of the global nature of their activities, due to the implementation of which they occupy a leading position in modern international economy relations. In connection with this, transnational corporations have an extremely strong influence on the world economy.

In the process of evolution, the theory of TNCs developed and increased knowledge of the fundamental organizational foundations of economic progress. At the same time, two areas of theoretical research should be recognized as the most significant. First of all, the theory of TNC involves studying it as an organization, that is, the main element of the structure of any nature and complexity, in particular economic. And although this branch of scientific knowledge is a collection of different schools and concepts, in general, the theory of organization, it turns out, cannot be «fitted» to any single method or approach. An organization is a dynamic and multifaceted unit of human activity with a huge variety

of goal setting, internal processes, structure, motivation, incentives and control systems. The study of organizations as such does not have a final boundary, and the potential of their possibilities and energy is as limitless as the development of the vital forces of society itself.

Second, the theory of the firm is based on a large and multifaceted institutional foundation. It is the institutional nature of the firm that underlies the main theoretical paradigms. For the analysis of the principles and practice of the organization of the real sector of the economy, the institutional aspect is generally decisive. The methodological basis of theoretical analysis can be fundamentally different institutional approaches. However, in all cases, the characteristics of the firm as an autonomous economic unit prevail. As will be indicated later, the firm can be considered as a unit of the production and technological complex, as a subject of market relations and coordination, as a social community, as a coalition of resource owners, as a generator of knowledge and a driver of innovative development. At the same time, various aspects of the analysis come to the fore. It can be the nature of the firm, the necessity of its existence in the economy and its essential difference from other types of entities operating in the market, for example, from the state or households. It is also about the goals of the firm as a commercial organization. The origins of competitiveness (survival) and sustainable development of the firm in the system of market relations are of great theoretical interest.

In general, the principles of formation and theoretical justification of firms are constantly developing, changing depending on the general economic progress and the configuration of the system of factors that determine it. From a huge theoretical array, it is possible to single out the most significant approaches to the interpretation of the firm, as well as trace a certain evolution of views depending on the ratio and characteristics of the determining factors. Many developments relate to the phasing of TNC activities, as well as their generations, development trends, etc. In our opinion, it is appropriate to pay attention to the development and transformation of TNC activities in the context of the use of knowledge.

The prerequisites for the development of the theory of international capital movement were the classic economic theories of the 19th century (theories of A. Smith and D. Ricardo), which consider international trade as an engine of internationalization and integration of world economies. Processes of internationalization through the development of trade were seen as the main catalyst for the growth of national welfare, especially if a country specialized in those areas where it had a comparative advantage. Based on these principles, JS Mill first began to develop the theory of capital movement between countries. The scientist saw the reason for the export of capital in the profit rate, which tends to decrease in capital-rich countries. Economists J.A. Hobson, J. Keynes transferred the provisions of the factor theory of Z. Seya on international relations, formulating the postulate about the alternative of international trade and the international movement of factors of production. In this connection, supporters of this theory became interested in the marginalist theory of the marginal utility of factors [125].

The Marxist model of the theory of capital export was based on the postulate of surplus capital and its export. This was explained by the fact that monopolies, mainly through direct investment, have advantages over local competitors. In the first half of the 20th century, the well-known Swedish economists E. Hecksher and B. Olin formulated the neoclassical theory of international capital movement. According to their theory, capital, as a factor of production, is mobile and, as a rule, moves from countries where it is relatively mobile to poorer countries with capital, where it is able to bring higher profits. English economist R. Harrod in life without a model of economic dynamics, showing that the lower the rate of economic growth of a country rich in capital, the stronger the tendency to export capital from it. E. Domar, examining trade balances and employment, clarifying that the export of capital depends on how the growth rates are translated into the country of income from foreign investments are related to the growth rates of domestic investments [103].

J. Galbraith, who believes that the genesis of TNCs is due to technological reasons: modern products are more complex than in the 19th century, and their sales and service abroad require companies to create local production of goods and services. In the theory

of the international product life cycle (1966) by R. Vernon, the Dynamic Influence between international trade and foreign investment is described. This concept arose on the basis of the idea of organizing the production of goods on a new foreign site as a means of extending the product life cycle and minimizing variable costs with the help of commercial trade economic measures (optimization of taxation, customs barriers, etc). The «geese fly» paradigm was developed in the late 1930s of the XX century. Teachings of K. Akamatsu as a generalized theory of economic development. Unlike the concept of R. Vernon, developed from the positions of a firm or a leading country, K. Akamatsu's «catch-up cycle» paradigm explains the development of catch-up economies. It presupposes interaction and dynamic changes in economic relations between advanced (leaders) and developing (catch-up) countries, as the latter develop their economies, competing with the leaders. All other theories of transnationalization to some extent can be reduced to the varieties and directions of development of the theory of economic power in the broad sense of the word and allow specifying some of its general provisions for the study of TNC issues [38].

A devastating article in the 1960s on the interpretation of TNCs from the point of view of the theory of industry markets and monopolistic competition (S. Heimer, C. Kindeleberger) connects their emergence with an attempt to prevent the formation of possible competitors abroad and find monopoly power. The advantages of economic power as a relationship are at the center of research in the framework of the direction dominant in the analysis of TNCs from the 1970s and 1980s - the theories of transaction costs and internalization, which are based on the idea of the movement of direct investments as part of the intra-firm operations of large economic complexes - TNC The development of the theory of internalization can be considered the «eclectic» theory of TNCs by J. Dunning. This model is based on the Idea that a firm starts production abroad when three prerequisites coincide: it is more profitable for the firm to realize these advantages locally, and not through the export of goods and technologies; the firm uses production resources abroad more effectively than at home.

There is a direction of analysis in economic science that determines the emergence of transnational corporate ties as a factor in the formation of the center of economic power in the world economy. In this case, we are not talking about individual corporations, but about the interconnected community of TNCs. The study of transnational corporate networks proceeds from several premises: corporations are members of an integrated social network based on cross-shareholder ownership through long-term contracts, land, alliances, and personal contacts. In the conditions of the development of the knowledge economy, TNCs can be considered as a way of generating and organizing knowledge, because the peculiarity of corporations of the knowledge economy is that one of the most important sources of the corporation's strength is a resource that it is unable to possess, which fundamentally distinguishes the current situation from the existing still industrial society. The competitive strength of such a corporation lies in the implementation of liberal soft mechanisms and tools for the growth of human and intellectual potentials, development into human and intellectual capital and consolidation of their carriers in the corporation. A study of the empirical impact of intellectual capital on the effectiveness of corporations is shown in Table 2.3

Table 2.3

**Empirical studies of the impact of intellectual capital on
the effectiveness of corporations**

The authorss	The results research	Characteristic Selections
N. Bontis, VK Keough, S. Richardson, 2000	The impact of intellectual capital on the performance of TNCs	107 Malaysian companies of various industries activity
M. Subramaniam, MA Yundt, 2005.	Positive influence of intellectual capital on innovative activity	93 US companies
C.Huang, C. Liu, 2005.	Linear positive dependence of return on capital on intellectual capital	297 Taiwanese Companies

E. Popov, M. Vlasov, 2006	The positive impact of investments in the production of new knowledge on the profitability of the enterprise	Large enterprises Ural region
A. Bykova, M. Molodchyk, 2011	A positive relationship between the amount of intellectual capital and the growth rate of the company's revenue	401 enterprises Perm region

Source: created by the authors based on [39]

The theoretical explanation of TNC cannot be adequately developed only in the system of traditional concepts of any of the branches of the economic mainstream. The knowledge-based approach has long been established and positioned as a significant part of a broader resource approach. For many modern TNCs, the need to explain the generation, distribution and use of knowledge has two reasons. First, the TNC as a separate subject of economic relations, which has its own structure and boundaries, can organize the accumulation and coordination of knowledge better than the free market. By the way, similar arguments were given by R. Coase, explaining the advantages of the firm compared to the free market from the standpoint of transaction costs. Secondly, and this is even more significant, the TNC as a separate organization with its own interests and capabilities promotes the assimilation and development of new knowledge created by individuals, ensures mutual relations between them and the integration of resources of expert knowledge, that is, the transformation of an individual level of knowledge into a phenomenon characteristic of the organization as in general, as well as its structures («supra-individual» knowledge). Thus, relations between individuals and their groups are intensified. Until now, a similar range of TNC definitions could fit into almost any theoretical paradigm, because it focused mainly on one partial section of the resource approach. In fact, this was the case within the framework of neoclassical theory and methodological individualism [40].

The interpretation of TNCs as a source of knowledge resources has become relevant in the conditions of the post-industrial economy. Its organizational structure, trends of development and changes, criteria for evaluating activity, coordination of the interaction of

subjects of market and hierarchical relations are significantly different from everything traditionally described by economic theory. The new institutional environment of the post-industrial economy (and society) in itself requires theoretical understanding. Within the framework of new theoretical approaches, the subject of special analysis must inevitably be the relationship between TNCs and methods of market coordination. The components of the « knowledge » capital of TNCs in the conditions of the development of the knowledge economy are shown in fig. 2.1.

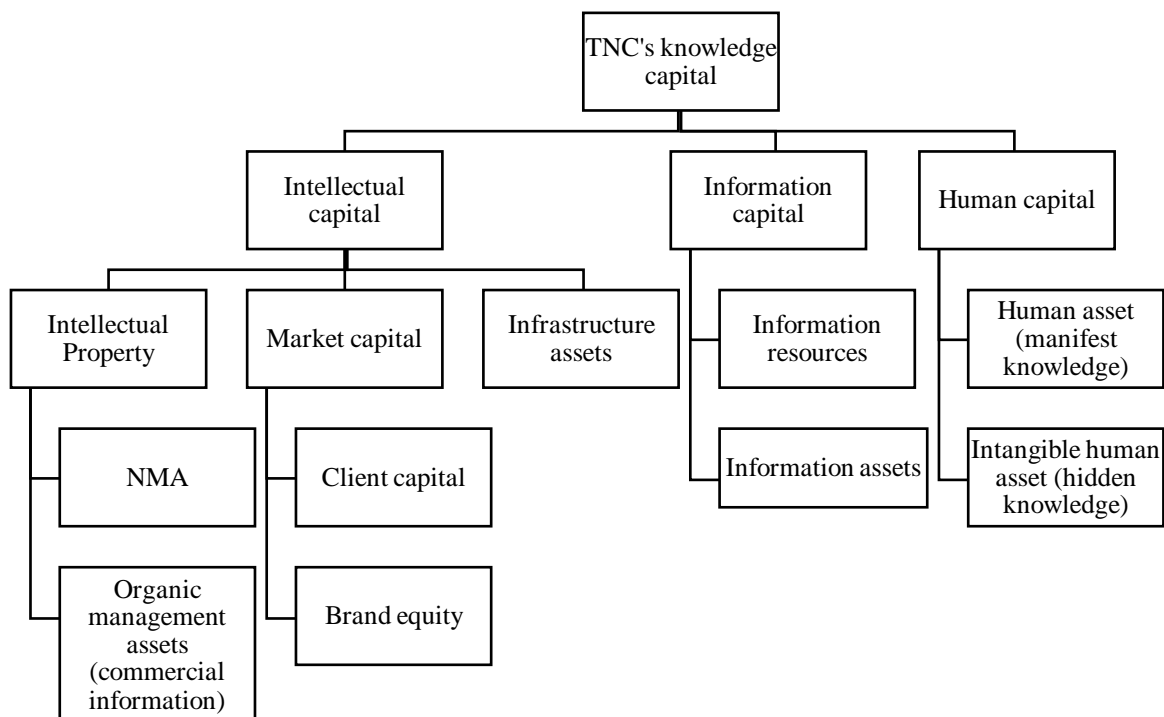


Fig. 1.2. Components of the «knowledge» capital of TNCs in the context of the development of the knowledge economy

Source: created by the authors based on [41]

Almost all known concepts of TNCs, which include the requirements of the innovative economy in the system of their theoretical explanations, are adapting to the new realities in one way or another. Thus, the mentioned resource approach gained further development in the concept of dynamic capabilities of TNCs in response to uncertainty, dynamism, multidimensionality of connections and relationships and changing institutional

environment. The concept of dynamic capabilities was precisely the most adapted to the needs of rapidly changing innovative segments of the economy. The theory of innovative TNC is formed as the innovative (post-industrial) economy itself develops. However, it should be noted that it is not only about TNCs of the high-tech sector, but also about the general orientation of TNCs towards constant innovation and efficiency improvement. At the same time, the importance of traditional TNCs of the real sector does not decrease at all, they remain the dominant organizational model of the industrial economy. In the innovative environment, new signs appear in the company, in particular: the great importance of information and communication technologies, a high share of intangible assets. Knowledge is no longer just an important resource, but is growing into a critical factor of market success and competitiveness.

The motivational model of intelligence is a driving force for stimulating creativity, energy, and responsibility of employees. The specificity of the corporate motivational model of intelligence consists in working with the intellectual potential of employees, aimed at increasing intellectual activity in the process of forming intellectual capital. The intellectual potential of the company's employees is a subsystem of the general creative potential of employees, an organic unity of individual intellectual abilities that primarily reflect the ability to reproduce knowledge, as well as realized and unrealized creative possibilities of individual intelligences. Carriers of unique elements of intellectual capital are also carriers of special needs. Several classifications of people's needs are known for different reasons and they correlate with the concept of A. Maslow. The heuristic value of A. Maslow's classic pyramid of needs also lies in the fact that it contains the necessary grounds for typifying the ways of human existence.

The most valuable and irreplaceable type of intellectual capital is human. It is basic and contributes to the successful development of other components. The organization is provided with qualified and loyal personnel, due to whose work the efficiency of operations increases and a competitive advantage is formed, which contributes to increasing the value of the company. Important directions for the development of the human capital of the organization are the implementation of a comprehensive system of

personnel training and the improvement of their qualifications, as a result of which the attraction of good specialists, reduction of staff turnover, use of new technologies, improvement of the quality of products and services, which means satisfaction of customer needs, identification of potential leaders and managers.

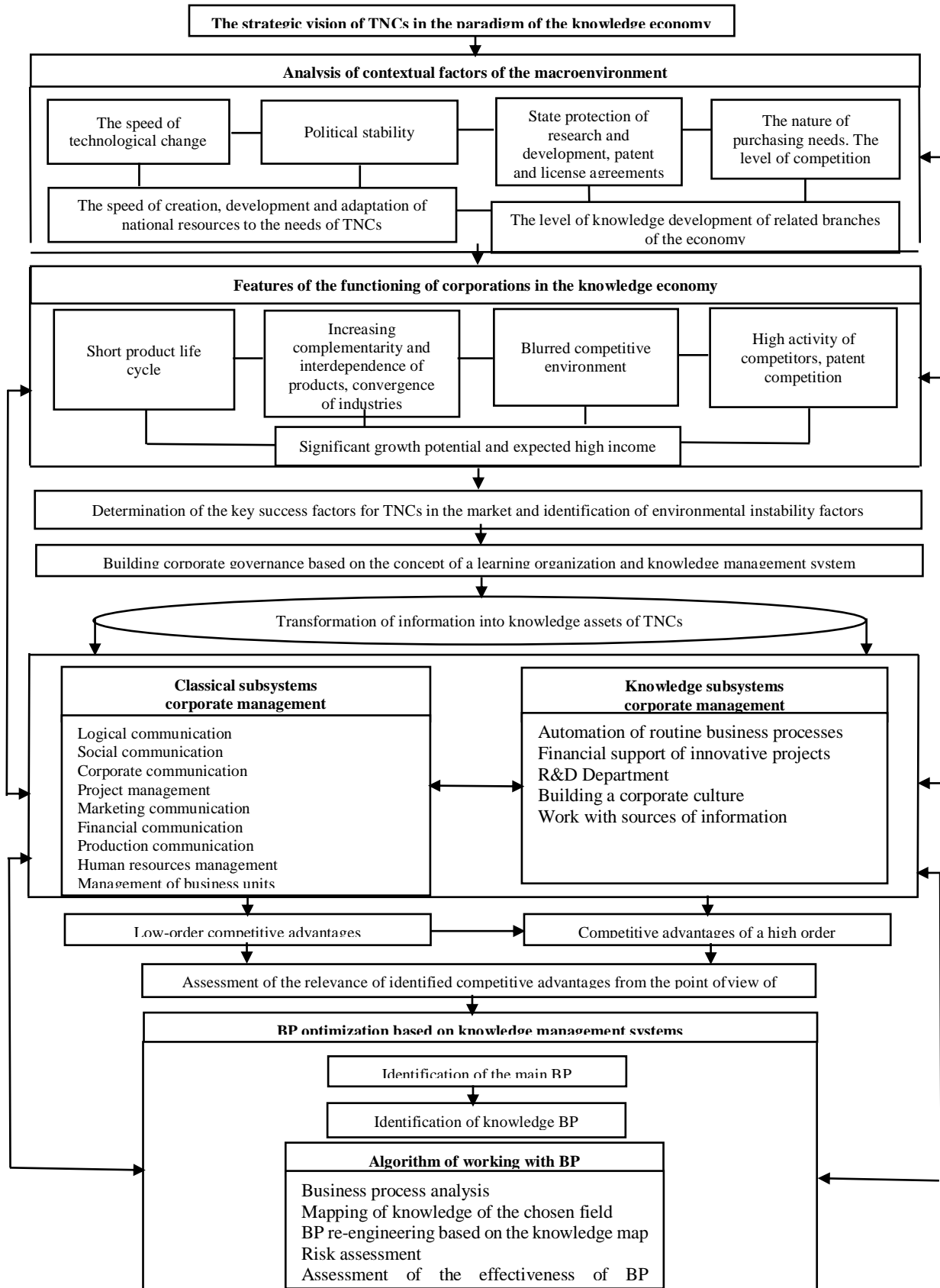


Fig. 2.2. The strategic vision of TNCs in the paradigm of the knowledge economy

The source was created by the authors based on [43], [44], [45]

At the current stage, it is appropriate to note that at the beginning of the XXI century. within the framework of the formation of the knowledge economy, it is possible to determine the levels of knowledge use, the analysis of which is given in the table. 2.4.

Table 2.4

Levels of knowledge utilization of TNCs

Levels	STRATEGY	PEOPLE	PROCESS	TECHNOLOGY	
LEVEL 5 Knowledge in the center of self-development of knowledge	The business strategy is constantly adjusted taking into account organizational training in knowledge management	There is a culture that encourages the free flow of knowledge throughout the enterprise	Communities of practice are formally connected	Corporate IT infrastructure combines knowledge management both integral and external to the organization	That's the direction you're headed
LEVEL 4 Knowledge management	KM strategy is defined with management accountability and sufficient resources to have a significant impact on results	There is a wide competence of KM in the company. Official organizations appear to support the KM	KM processes, practices and measurements are formalized and integrated with core activities	Enterprise portals, groupware, and more enable enterprises to create, share, and reuse to accelerate business results	
LEVEL 3 Use of knowledge	KM strategy is defined as part of the business strategy, but no responsibility is assigned (e.g. CCO)	Awards exist to encourage the creation, sharing and reuse of knowledge; learning becomes a cultural norm	KM processes are integrated into business processes, and knowledge is embedded in business processes	Developed data storage and document management technologies to support, share and reuse knowledge	This is what you usually do first
LEVEL 2 Knowledge is conscious	Leadership identifies the importance of KM to the business, but has not yet incorporated it into their strategy	People are aware of the limitations of KM, but there is no commitment to KM leadership	There are limited processes for KM	There are basic means of converting KM (e-mail)	That's where most organizations are today
LEVEL 1 Chaotic Knowledge	Corporate strategy is internally oriented, and knowledge does not affect corporate direction	People in the company are resistant to changes and constantly accumulate knowledge	There is no process for creating, sharing and applying knowledge	There are no KM-providing technologies	

Source: created by the authors based on [46], [47], [48]

Important factors of the competitiveness of transnational corporations are: the hierarchical structure of TNCs, «human capital» embodied in intangible assets, and the use of network technologies, which significantly increases the efficiency of business and allows TNCs to implement functions that determine the development of the world economy in general: regulation of production and distribution of products on a global scale; stimulating the globalization of the economy.

The last decade was marked by significant changes in the world economic system. The economic interaction of the subjects of the world economy has increased, characterized by the liberalization of national and global financial markets and a significant increase in cross-border movement of capital. The world economic space is turning into a "cosmopolis" global economy, where the pronounced interdependence of all financial entities within a single whole can be traced. Under such conditions, transnational corporations (TNCs) become the main players that exert a significant influence on the development of the world community, because the current stage of the development of the world economy is characterized by the formation of a global model of economic development. Economic globalization is a qualitatively new stage in the evolutionary development of economic life, the character of which is manifested in the internationalization of production and scientific and technical progress based on TNCs, their numerous connections and alliances, and the modern information revolution, which is accompanied by the formation of a global network of international financial markets. It is important to note that the intensification of global competition, the activities of international corporations, global financial organizations, and purposeful protectionist measures of the leading states of the "golden billion" determine the need to take into account the features of the global environment as a factor in the formation and development of TNCs, which, in turn, is of great significance for improving the mechanism interaction of national economies.

CHAPTER II. KNOWLEDGE DETERMINANTS OF THE FORMATION OF A NEW PARADIGM OF “DIGITAL BENEFITS LTD” COMPANY AS AN EXAMPLE OF TNC

2.1. Analysis of the company’s environment, organizational structure, knowledge indicators

In the conditions of the formation of the knowledge economy, TNC can be considered as a dynamic institution capable of influencing the development of economic systems at both the national and international levels, which is in constant interaction with them through its own organizational, economic, technical, and social levers. Actively influencing the international economic system, TNCs are forming new economic relations at both the national and global levels. It is also important that at the current stage the meaning of the concept of "world economy" is changing, which is increasingly turning from "international" to "transnational", characterized by the establishment of more stable and long-term economic ties. Most foreign authors attribute the dominant role of transnationalization in the process of creating a new "geoeconomic map of the world" and the growing economic interdependence of states, where division by country is of secondary importance, inferior to division by economic forces and interests. Transnationalization as an objectively determined process with multi-level and contradictory manifestations significantly adjusts national and international development strategies and is therefore the most attractive object of scientific research

Having analyzed the approaches to determining the effectiveness of TNCs, we should draw certain conclusions. First, we note that the considered theories of the effectiveness of transnational corporations concentrate on completely different aspects of their activity,

which is due to the multifaceted nature of the studied phenomena. Secondly, representatives of numerous directions in the research of TNCs focus their attention on certain features of the functioning of transnational corporations, not taking into account others. At the same time, most researchers emphasize the monopolistic nature of TNC activities, which results from the advantages of their competitors. It is worth noting the lack of a comprehensive approach that would take into account all the main factors affecting the effectiveness of transnational corporations.

Table 2.1

Indicators that determine the effectiveness of TNC activities

Traditional indicators	Modern indicators
Income on capital (profit)	Competitiveness
Investment efficiency	Staff efficiency
Capital expenditure	Personnel costs
The structure of the financial balance	Qualification structure of capital
Changes in the financial balance	Changes in personnel
Depreciation of fixed assets	Use of potential personnel
Capital investment plan	Personnel development plan
Capital structure	Structure of personnel motivation (ratio of basic and variable compensation)
Capital gain	Costs of personnel training and retraining
Long-term and short-term financing	Projecting costs for contacts with managers, environmental protection, local social infrastructure
Minimization of financial risks	Minimization of social risks

Source: created by the authors based on [36], [37].

From our point of view it is important to show the effective usage of the knowledge component based on the analyses of the company DIGITAL BENEFITS LTD. (the "Company") is a Exempt Private Company Limited by Shares, incorporated on 8 December 2017 in Singapore . The address of the Company's registered office is at the PENINSULA PLAZA building. The Company current operating status is live and has been operating for 5 years. This Company's principal activity is wholesale trade

of a variety of goods without a dominant product. The system of “knowledge” capital of the company is presented in Figure 1.

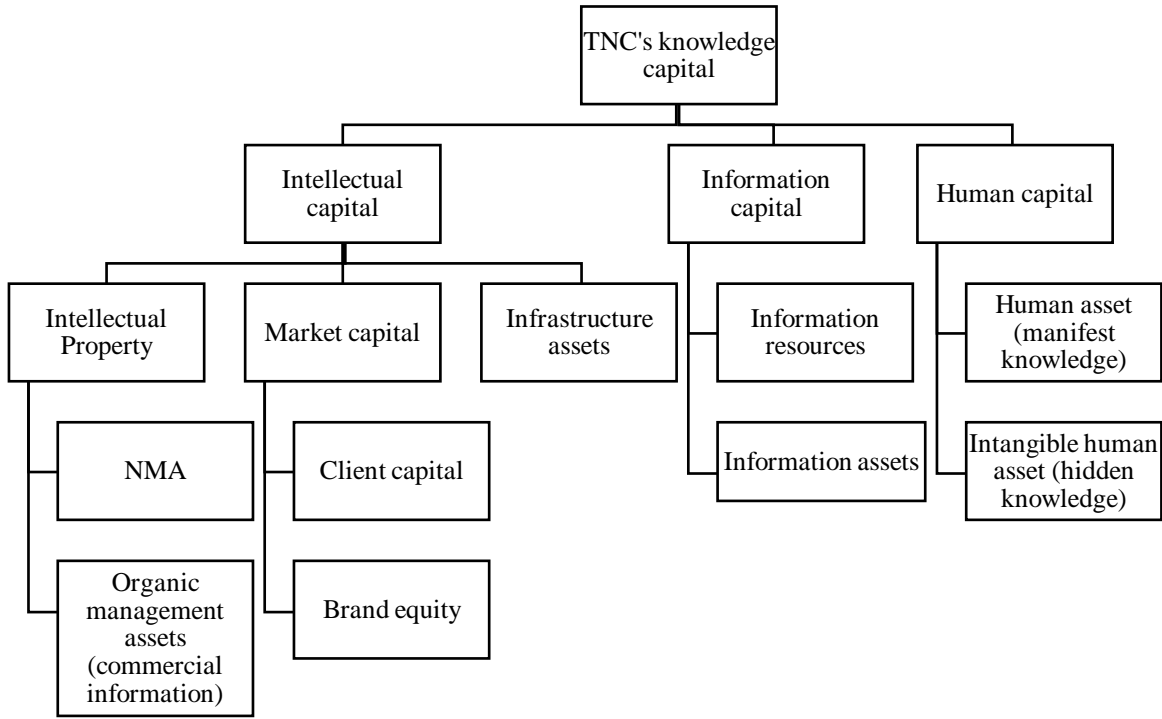


Fig. 2.1. Components of the «knowledge» capital of TNCs in the context of the development of the knowledge economy

Source: created by the authors based on [41]

The importance of intellectual capital contributes to greater organizational openness of the firm. From the point of view of its internal organization, this openness and dynamism are manifested in a high degree of involvement of personnel in the company's strategy and current activities. From the point of view of external relations within the framework of market cooperation, the company is involved in various network interactions - innovative alliances and consortia, strategic alliances of various scales and organizational certainty. In the conditions of the formation of the knowledge economy, from our point of view, the strategic vision of the TNC should look as follows [42].

The peculiarity of corporations of the knowledge economy is that one of the most important sources of the corporation's strength is a resource that it is unable to possess,

which fundamentally distinguishes the modern situation from the one existing in the conditions of an industrial society. The competitive strength of such a corporation lies in the implementation of liberal soft mechanisms and tools for the growth of human and intellectual potentials, development into human and intellectual capitals and consolidation of their carriers in the corporation. The following main factors have a significant influence on the growth of the potential of human and intellectual capital in the corporation: the level of development of human capital that functions in the corporation, the scale of its involvement in the corporation, as well as the methods of interaction of the owners of human capital with the vertical of economic power of the corporation. The effectiveness of the reproduction of intellectual capital is greatly influenced by the corporate motivational model of intelligence, which is a mechanism aimed at activating the intellectual potential of the company's employees and turning it into intellectual capital. The levels of knowledge utilization of DIGITAL BENEFITS LTD is presented in Table 2.1.

The new paradigm of innovative activity of DIGITAL BENEFITS LTD is characterized by intensive interaction of the market and technologies, the presence of many "knowledge centers", both in the center and on the periphery, a two-way process of technology transfer both between enterprises and between different functional and organizational units. Many international companies participate in joint international research projects. As a result, new forms of scientific research activity have emerged with the participation of producers, consumers, as well as universities and research institutes. Replacing labor with knowledge marked the transition of social production from material to innovative. The basis of innovative production is the use of new knowledge or the new use of knowledge embodied in technology, know-how, new combinations of production factors, the structure of organization and production management, and allow obtaining intellectual rent and various advantages over competitors. Thus, innovative production is not a new field of production. This is the nature of production activity, in which the main role in the production process shifts from the mechanical use of information to the intellectual, creative one. The transition from purely material to innovative production means that along with the material, tangible form of being of social production, an "elusive" form appears, which we

propose to call anthropocentric. The essence of the anthropocentric form of production is the generation of knowledge, i.e. "emanation", the creation of knowledge by processing information on the basis of common knowledge. The source of the generation of new knowledge is the intellectual activity of a person, based on knowledge, a conscious, morally oriented ability to collect, accumulate and process ever-increasing flows of information.

Table 2.2

Levels of knowledge utilization of DIGITAL BENEFITS LTD

Levels	STRATEGY	PEOPLE	PROCESS	TECHNOLOGY	
LEVEL 5 Knowledge in the center of self-development of knowledge	The business strategy is constantly adjusted taking into account organizational training in knowledge management	There is a culture that encourages the free flow of knowledge throughout the enterprise	Communities of practice are formally connected	Corporate IT infrastructure combines knowledge management both integral and external to the organization	That's the direction you're headed
LEVEL 4 Knowledge management	KM strategy is defined with management accountability and sufficient resources to have a significant impact on results	There is a wide competence of KM in the company. Official organizations appear to support the CM	KM processes, practices and measurements are formalized and integrated with core activities	Enterprise portals, groupware, and more enable enterprises to create, share, and reuse to accelerate business results	
LEVEL 3 Use of knowledge	KM strategy is defined as part of the business strategy, but no responsibility is assigned (e.g. CCO)	Awards exist to encourage the creation, sharing and reuse of knowledge; learning becomes a cultural norm	KM processes are integrated into business processes, and knowledge is embedded in business processes	Developed data storage and document management technologies to support, share and reuse knowledge	This is what you usually do first
LEVEL 2 Knowledge is conscious	Leadership identifies the importance of KM to the business, but has not yet incorporated it into their strategy	People are aware of the limitations of KM, but there is no commitment to KM leadership	There are limited processes for KM	There are basic means of converting KM (e-mail)	That's where most organizations are today
LEVEL 1 Chaotic Knowledge	Corporate strategy is internally oriented, and knowledge does not affect corporate direction	People in the company are resistant to changes and constantly accumulate knowledge	There is no process for creating, sharing and applying knowledge	There are no KM-providing technologies	

Source: created by the authors based on [46], [47], [48]

Of course, organizations have always relied on knowing what to do and how to do it, but often take it for granted. The economic weight of knowledge and its fundamental role

in the survival of corporations is constantly increasing. Companies are becoming interested in knowledge management because they understand that they must consciously invest in the creation, preservation and use of what has become the most important resource. Peter Drucker, a well-known management scientist, coined the term «knowledge worker» and described knowledge as «the only sustainable competitive advantage.» Despite the fact that the exact monetary equivalent of the value of knowledge in the organization cannot be calculated, there are some criteria for measuring its economic value. The difference between a company's market value and the value of its tangible assets is one indicator of the value of intangible assets, most of which are a form of organizational knowledge. 50% of the investments of manufacturing companies fall into intangible areas, such as scientific research and development, training, professional experience, etc.

In the conditions of the formation and development of the knowledge economy, the transnational corporation has a threefold nature: first, TNC is a product of globalization and internationalization of the world economic system; secondly, it is an independent subsystem of the world economy, which determines the type and nature of economic relations with other subjects and subsystems, as well as the direction and intensity of the processes of globalization and transformation of the world economy; and thirdly, TNC is an intermediary in the process of transgression of national and global economic interests. Moreover, the transnational corporation itself is constantly in a state of dynamic transformation and actively adapts to changing conditions of the external environment and transforms this environment through its activities.

2.2. Knowledge management of TNC development in the paradigm of the new economy

Corporations that rely on traditional factors of production - financial capital, cheap labor and natural resources - are pushed to the economic periphery. Therefore, corporate knowledge is often considered as intellectual capital, which includes everything that has

value for the enterprise and is embedded in the people working for it or arises from production processes, systems or organizational culture. In a world characterized by globalization, increased competition, and rapidly shortening product life cycles, flexibility and adaptability are critical qualities for business success. The pace of change in the business environment is increasing, especially when it comes to technological changes. Chaos laws and systems theory are increasingly used to describe such an environment. The degree of adaptability and flexibility depends on the ability of both individuals and entire organizations to accumulate experience and learn from it. In such an environment, only those organizations that learn the fastest are able to survive and outperform their competitors.

The faster the pace of change, the greater the need to accelerate learning both at the level of an individual and at the level of an organization. Organizations must develop knowledge-based capabilities that are both durable and well-adapted.

In other words, corporations must become «intellectual», consciously seeking to learn as much as possible about the nature of their internal and external environment and the relationships between them. By studying their internal environment, they should strive to better understand the nature of their capabilities and actions, end products and services in order to add great value to them. By studying the external environment, they should seek to better understand their customers, distributors, suppliers, competitors, technologies, economic trends, and so on. Only by understanding their own capabilities and how they relate to the needs of their customers can a firm develop its competitive advantage. Corporations continuously study their own business and its connection with the external environment. Modern mechanisms can be formed based on modern approaches to knowledge management and tasks of knowledge management, which are presented in table 2.3.

Table 2.3

The task of knowledge management

Task management Knowledge	Actions objects management knowledge for solving these tasks
------------------------------	--

Diagnostics and analysis of the knowledge possessed by the organization	Comparison of the knowledge map (identification all kinds of knowledge available in the company); assessment of the organization's intellectual capital; determining the organization's need for knowledge to achieve tactical and strategic goals; planning of the knowledge management system in the organization; analysis of the user's knowledge needs
Obtaining the necessary knowledge	Assistance in finding information, informing about its availability; employee training; creating values of the learning organization; automated acquisition of knowledge; extraction of knowledge
Creation of a knowledge management system	Motivation to exchange knowledge and experience; creating an organizational structure that facilitates knowledge sharing; creation of an atmosphere of trust for the exchange of knowledge; structuring of knowledge; spread of knowledge
Using the knowledge management system	Encouraging innovations (innovations); organization of teamwork, cooperation; creation of conditions for conducting experiments; creation of structures of knowledge reuse methods on the basis of databases, archives and repositories; development of work group support systems; revision of knowledge.

Source: formed by the authors based on [50]

Summarizing the above, we can say that at the beginning of the XXI century the specificity of the knowledge management system in multinational companies is as follows:

- first of all, it is necessary to take into account the geography of the emergence and use of knowledge, which gives rise to the spatial aspect of UM. In connection with this, there is a division of powers of the main and subsidiary companies in strategic management, management of knowledge flows, distribution of technologies, methods of managing processes in divisions, etc. Knowledge arises locally, and an international company needs to organize it, which is connected with the solution of a wide range of organizational, strategic, procedural, temporary, financial and other issues;

- secondly, international companies become subjects of technological transfer, where tasks arise, for example, management of technological development of foreign productions, coordination of research and development, maximization of profit from the spread of technologies;

- thirdly, a special multinational environment and culture emerges in international companies, but at the same time there are uniform institutions and systems that ensure work with knowledge. Geographical remoteness and mental differences required appropriate institutional and organizational approaches and tools for constant communications and information exchange. ICT helped to remove the physical barriers of space;

- fourth, international companies have a specific external environment that is built around each division in different countries. This environment includes partner companies, universities and individual scientists, and business communications become its main component. As a result, there is a special effect of corporate training with numerous sources of knowledge, permanent and international nature of training;

- fifth, international companies accumulate and integrate intellectual resources fragmented in different countries. In view of the above, the practice of KM in international companies is always specific not only in terms of remoteness, but also in terms of the scale and variety of actions in different countries.

As the example of building the effective knowledge management system it is possible to mention strong national company from Singapore called Digital Benefits Ltd. When building an effective knowledge management system in a company, there are some important point that needs to be mentioned:

1. The construction of a knowledge management system cannot be reduced only to the choice of a certain computing technology, but different organizational tools should be used.

2. The main difficulty in applying corporate knowledge management technologies is related to the fact that you need to choose one or another software, while ignoring the issue of staff motivation for a productive knowledge exchange.

3. The active use of specific technologies will ensure the active participation of employees in knowledge sharing processes.

4. The presence in the company of an integrated knowledge management system will significantly accelerate and intensify the processes of organizational learning and development, significantly save financial resources by retaining valuable experience.

The development of an organizational knowledge management system should be broken down into the following steps:

- 1) formation, coordination, approval and dissemination of corporate policy in the field of knowledge;
- 2) creation of information and linguistic support for the system;
- 3) introduction of a knowledge inventory system for the system being created;
- 4) introduction of a system for assessing potential experts and consultants;
- 5) development of organizational and software.

The right steps in the knowledge management helps the national companies in the time of the development of the knowledge economy to achieve the economic results and become competitive.

The effectiveness of interdependent activities depends directly on the organizational culture, organizational structure of the corporation, its infrastructure and communication links. Speaking about knowledge management activities in practice, leading multinational corporations have in mind the implementation of eight interrelated processes, in particular:

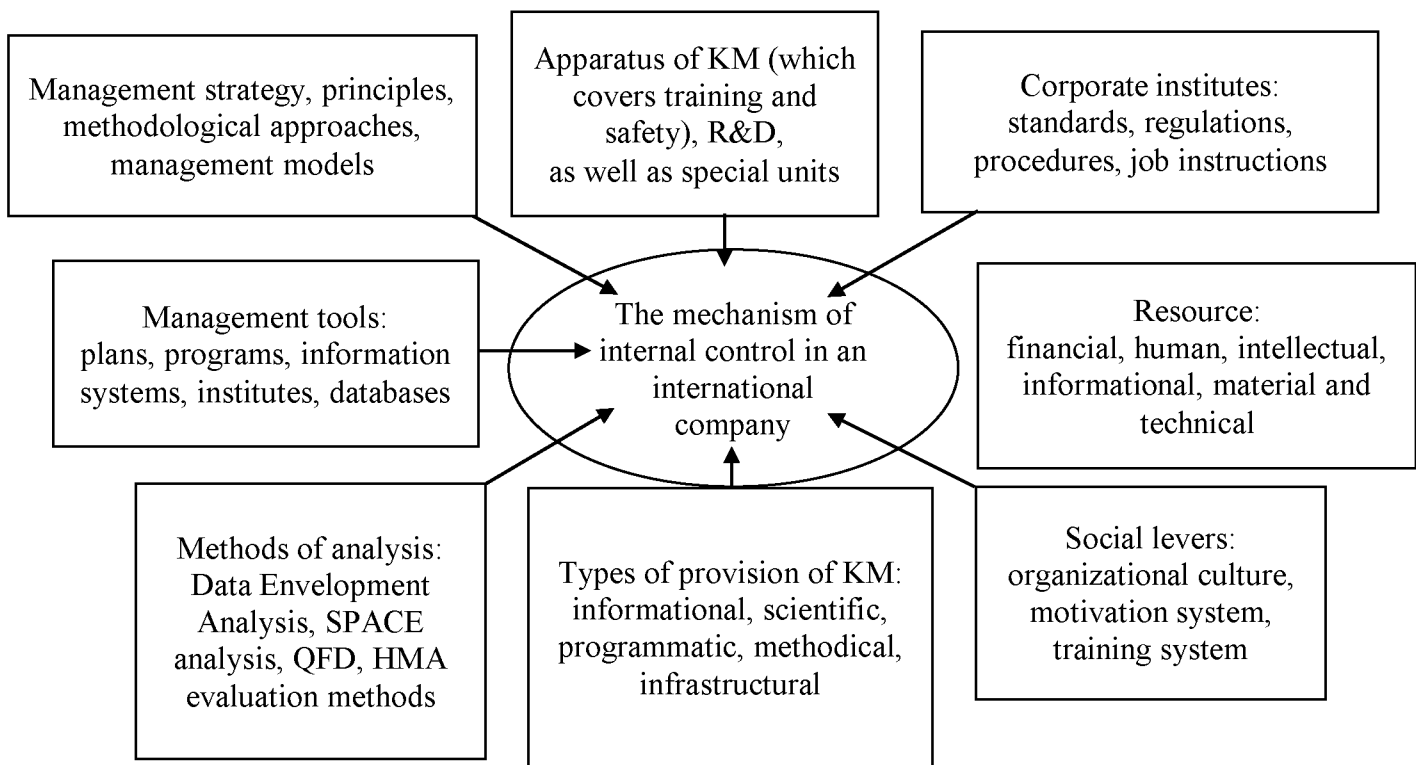


Fig. 2.2 Modern mechanisms of knowledge management

Source: created by the authors based on [51], [52].

1. Creation of new knowledge. The creation of knowledge can be considered as a sequence of mutual transformations of hidden knowledge into explicit knowledge and vice versa, which forms the so-called spiral of knowledge. At the same time, hidden knowledge is of the greatest importance, as it is very difficult to buy and transfer from one person to another.

2. Providing access to new knowledge that is outside the corporation. Obtaining relevant knowledge from the outside is in the center of attention and concerns of managers. The analysis of existing research allows us to conclude that it is not necessary to completely rely on the opinion of consumers and not to develop innovations independently, and also it is not necessary to follow more successful competitors and create clone corporations.

3. Use of existing knowledge when making decisions. This slice of knowledge management builds on earlier achievements, but with a different emphasis. As an example, it is proposed to study such a powerful tool of strategic management as scenario planning. In the conditions of intense changes, scenario planning becomes a key tool of knowledge that allows you to stay in business. The first key feature of scenario planning

is that different scenarios do not dictate probabilities. With this approach, the company must be equally ready for any variant of the development of events. Another feature is the use of «option thinking» when developing investment decisions. From the very beginning, decisions are structured so that they have special trigger points that would allow managers to make changes to the implemented program of actions as the uncertainty of the situation becomes clearer. This approach provides flexibility, allowing to avoid frankly failed decisions

4. Implementation of knowledge in processes, products, services. This vector of knowledge management is not new. In particular, in the 70s and 80s of the last century, numerous Japanese companies achieved phenomenal success on world markets, using the well-known quality management tool, which allows you to effectively transform consumer requirements into product quality parameters. One of the key properties of the «house of quality» is that it helps build an intra-organizational dialogue regarding consumer requests and product characteristics. Dialogue is one of the main means that help the birth of new knowledge [94.]. In other words, one of the fundamental properties of the «house of quality» is its peculiar «magnetism» in relation to knowledge. It is this «magnetism» that allows us to implement the maximum amount of knowledge available in the company into products.

5. Presentation of knowledge in documents, databases, software, etc. The relationship between knowledge and information is one of the hottest topics discussed in knowledge management. Previously, it was believed that information and its effective management is the key to success in modern conditions. However, at the current stage, it can be argued that companies base their actions not on information, but on knowledge. Knowledge includes an explicit and a hidden component, and the central role belongs to the latter. Emphasis on this component is placed on the limit of the effectiveness of the use of information technologies.

6. Stimulation of knowledge growth with the help of organizational culture and incentives. The «life» of knowledge within the corporation is the core of knowledge management issues. That is why issues of organizational culture and motivation are of

fundamental importance for the new discipline. To achieve success in modern conditions, any company must become a «self-learning (learning) organization.» Master five disciplines in the field of knowledge perfectly: system thinking, personal mastery of each member of the corporation, building and supporting a common vision in the organization, «pictures of the future», the ability to work with mental models, the ability to learn in a team - discarding stereotypes and moving to a «common « thinking consisting in dialogue (working with meanings) and discussion (collision of different points of view)[305]. These five disciplines themselves form a complete system. If at least one of its five elements is in a bad state, the company will not be able to be a «knowing organization» and will not be able to count on success.

7. Transfer of existing knowledge from one part of the organization to another. The task of reusing previously created knowledge to solve new problems has long been in the focus of managers' attention. In modern conditions, its relevance has only increased, because new ideas and inventions in the conditions of the development of the knowledge economy are not always in the technological sphere (information technologies), but in the sphere of original organizational solutions, in which information technologies are assigned a supporting role

8. Measuring the value of intellectual assets and the impact of knowledge management on business results. The problem of measurements has always been one of the key problems of managerial theory and practice. One of the key problems of knowledge management is determining what is «value» for the organization, what is meant by «valuable» information and how to extract «valuable» knowledge from a huge amount of data. Knowledge management turns into the most important factor in the creation of benefits and provides competitive advantages only if in the very concept it is not considered as a structural link of control, but is understood and formed in the light of the orientation towards the change of paradigms.

Based on the analysis of the features of the formation of the knowledge management system, it is possible to determine the features of the approaches to knowledge management. In particular, today through analysis it is possible to single out and

characterize cross-cultural similarities and differences between American, Japanese, European, Chinese and Ukrainian approaches to KM, which are clearly presented in the table. 1, which examines their distinguishing features, such as mission, mentality, ideal type and embodiment of knowledge, mechanism, goal, focus, strategy, process, means and metaphor of KM.

At the heart of the American approach to management is the idea that knowledge, capital and labor are strategic sources of stable competitive advantage for companies, industries, and nations as a whole. In the United States, the main practical areas of knowledge management are related to the collection, distribution, reuse, measurement of already existing «encoded» knowledge and information, that is, the compilation and use of a knowledge base. Practitioners study information systems as a means of collecting and disseminating «explicit» knowledge, companies measure the success of KM in the form of the amount of profit from investments in knowledge. KM is formed in market conditions, using market concepts and terms, and the main work falls on the shoulders of the «knowledge manager» and his subordinates, thus a great emphasis is placed on the role of the individual. American scientist R. Cole calls it American competitive individualism. In the United States, KM is conducted with the help of technology, in the language of economics, while little attention is paid to social factors, power and conflicts. KM is perceived as a new way of doing things, with a new rational view of tools and systems, rather than people and processes. The main feature of the knowledge economy in the USA is information processing. European and Asian approaches are completely different from the American one

So, in the Japanese approach, in contrast to the American one, it is believed that the most valuable knowledge is «hidden» knowledge contained in a person's personal experience. The main emphasis is on the creation of new knowledge, which in the long term is a source for innovation. The creation of new knowledge, being a dynamic process involving people, cannot be managed by command and control. On the contrary, new knowledge appears if a context for mutual understanding is created. In Japan, this context is called «ba» (translated from Japanese - place). «B a», of which individuals are a part,

generates devotion to an idea, ideals, as well as relationships, in which social interaction and creativity are important. Within « BA» knowledge is created according to the stages, which are the stages of transformation of «hidden» knowledge into «manifest» and vice versa: socialization, externalization, combination and internalization (SECI model of I. Nonaka and H. Takeuchi) [54]. The transformation of knowledge occurs in a spiral, up and down from the individual to the group, to different levels of the organization, forming a network of interactions. The driving forces of « ba « and this process of transformation are the culture of mutual trust and care, the «culture of knowledge». As the philosopher Nishid said: «I love, therefore I exist.» It should be noted that the dominant feature of the Japanese mentality is groupism, the roots of which go deep into national traditions [55].

The European approach is based on the philosophical ideas of such thinkers as M. Foucault, Y. Habermas, M. Heidegger, F. de Saussure, K. Marx and L. Wittgenstein. Knowledge is not seen as an abstract mental substance, nor as a personal «belief supported by facts», but rather as a «competition of versions, stories». Thus, knowledge is constructed based on the situation, depending on the historical, social, material and cultural context. The division of knowledge into «hidden»/»explicit» in the European style is not as important as in the American and Japanese. The focus is on the fragile, meaningful, contradictory, rhetorical and collective nature of knowledge, i.e. the multiplicity of meanings inherent in knowledge, which is one of the main tenets of deconstructivism. Knowledge and work related to them are considered as discourses. Discourse is thought of as language inscribed in a communicative situation and, because of this, as a category with a more clearly expressed social meaning. Discourse does not arise in a vacuum, it is not easy to describe it with the help of complex technologies, culture cannot always be a mediator. Discourse arises in conditions where different levels of power, institutions, mastery, and collective knowledge are intertwined. As a result, there is a need for a clear approach to conflict resolution, ensuring legitimacy. KM is a political discourse that helps individual groups of knowledge-based agents create strategy and allocate resources [56].

Chinese approach. As it was 2,000 years ago, and to this day, the Chinese philosopher Confucius is considered the guide of the highest wisdom, because he collected, interpreted and disseminated knowledge. Speaking in the modern language of KM, the Chinese thought too transcendently and could not realize the market value of knowledge. I learn, therefore I exist - knowledge itself, according to ancient Chinese philosophy, is one of the main virtues and makes a person human. Despite the fact that in Confucianism, the approach to knowledge and ways of knowing was pragmatic, until the recent transformation of China into a socialist market economy of knowledge, knowledge was considered a virtue for achieving wisdom within oneself, that is, for cultivating oneself and managing the family, the state [57].

When the Chinese realized that their old and new competitors had long been managing knowledge in a «new» way, a new concept of wuli was created shili - renli (WSR), goes back to Confucius. Three aspects of knowledge management coexist in it - the material and technical aspect (Wu translates as «objective existence»), management of the process of cognitively constructive acquisition of knowledge (Shi - human activity) and management of socio-political relations between those who know (- relations). In the Chinese approach, the main thing in KM is to provide all employees with methodology, techniques and skills, create a flexible organizational structure, opportunities for communication, and then leave agents to create knowledge, exchange and apply it as they see fit. Taking these steps, the Chinese least think about what knowledge is, what its typology and nature are. The Chinese knowledge context described by the WSR model gives equal importance to both the technological and institutional dimensions, with an obvious emphasis on integration. Chinese scientists are searching for an integrated approach that would synthesize technology, human knowledge and institutional initiatives. The Chinese focus on context and relationships, not on objects and categories [58].

Ukrainian approach. KM as a science in Ukraine is just beginning to attract the attention of researchers. Let us consider the cross-cultural features of KM in Ukraine. Traditionally, there were several points of view regarding the types of Ukrainian

mentality, namely Westernism, Slavophilism and Eurasianism. The influence of Westernism, whose representatives were P.Ya. Chaadaev, A.I. Herzen, V.G. Belinsky, etc., was especially strong among the intelligentsia and entrepreneurs who adopted some features of a purely Western mentality.

Slavophiles (A.S. Khomyakov, I.V. Kireevsky, K.S. Aksakov, etc.) believed that Ukraine has a development path fundamentally different from that of Western Europe, its own way of thinking, based on its identity, patriarchy, conservatism and Orthodoxy. The basis of this mentality is a public form of management. Eurasianism is denied the influence of both the West and the East on the Ukrainian mentality. From Asia, Ukraine absorbed a form of group thinking - groupism, and from Europe - individualism. Groupism and individualism are two qualities that form the basis of the Ukrainian mentality.

However, groupism in our country is very different from Japanese groupism, which is based on a high level of discipline, loyalty and dedication. In our country, special importance is attached to verbal communication, and only during such communication is the exchange of «hidden» knowledge and the creation of new knowledge. Most people prefer to share knowledge orally - at meetings, meetings, in communities. Knowledge is considered deeply personal, secret, and therefore it is difficult to transfer it, since the culture of trust is not sufficiently developed in Ukraine [60].

Formation of mechanisms and means of management of «explicit» knowledge is also difficult due to insufficient development of telecommunication technologies. The next obstacle to the development of KM in Ukraine is such a distinctive feature as the preference of a short-term result over a long-term goal. V.O. wrote about this characteristic national feature. Klyuchevskiy. This feature contradicts the strategic content of KM - increasing intellectual potential in the long term. In our country, the attitude towards man as a unique source of knowledge and experience is just being formed. Unfortunately, many people still act and think according to the Stalinist principle «there are no irreplaceables». The attitude towards knowledge as an irreplaceable

resource is just beginning to take shape in Ukrainian practice, we are in the process of testing existing approaches and accumulating experience.

While having the experience connected with the company from Singapore, it was very actual to analyze the cross-cultural similarities and differences between approaches to knowledge management, that are presented in table 2.4.

Table 2.4

**Cross-cultural similarities and differences between approaches
to knowledge management**

Characteristic features of approaches to KM	Approaches to knowledge management				
	American	European	Japanese	Chinese	Ukrainian
Mission	I grow, which means I exist	I get practical experience, so I exist	I love, which means I exist	I study, therefore I exist	I observe, which means I exist
Mentality	Individualism	(Where) constructivism	Groupism	Pragmatism	Dualism
The ideal type of knowledge	Knowledge is a resource	Knowledge is Power	Knowledge–relationships	Knowledge is virtue	Knowledge is Secret
Embodiment	Knowledge base	Agents of Knowledge	Companies that create knowledge	Knowledge is life	Knowledge is personal Experience
Mechanism KM	Economy of knowledge	Knowledge as discourse	Culture of knowledge	Knowledge-based management	At the stage of formation
Target	Benefits in the near term	Legitimacy	Long-term advantage	Wisdom	Tracking results often more important than setting goals
Focus	Explicit, coded knowledge	Situationally constructed knowledge	Hidden subjective knowledge	Useful knowledge	Hidden knowledge
Strategy	Reuse	Politicization	Creativity of transformation	Integration	Strategy of approval reform
Process	Rationalization	Construction depending on the situation	Vision, emotions, trust care	Contextualization	At the stage of formation
Means	Market Technologies	Identity, meaning, participation, discussion	Socialization	Model wsr	At the stage of formation

Metaphor	We pluck the low-hanging fruit	We tell stories	We grow ba	We benefit for ourselves and the team	There are no irreplaceable ones
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Source: formed by the authors based on [61]

Analyzing the similarities and differences between approaches to KM, we see that in the US knowledge management is conducted with the help of technology, in the language of economics, while less attention is paid to social factors, power and conflicts. In Japan, the emphasis is on «implicit» knowledge, on the production of new knowledge, and technology is only a means for its transmission and storage. The difference between the American and European approaches is that politics, power and conflicts are seen by Americans as harmful to the functioning of the organization: «if a struggle begins to determine who exactly has the knowledge, then the project is doomed.» In the European approach, such questions are not very important, as well as the division of knowledge into «obvious» and «hidden». In China, the approach to KM is centralized and integrated, that is, it synthesizes technology, human knowledge, and institutional initiatives.

It should be noted that the concentration of the strategy on knowledge alone will not be able to change the competitive position of the enterprise. The fact that a number of companies have «directors of knowledge» and «directors of training» does not guarantee success. Interaction, connections between the subsystems managed by them should become the subject of new strategic planning. And they further state: «Only systemic strategic planning can cover the enterprise in its entirety. This is the mission of strategic planning at all levels of management».

Table 2.5

Typology of TNCs based on a key type of corporate knowledge

Types of organization	Key types of knowledge	Management features	Current issues
1	2	3	4

organizations, dependent from experts	Action-oriented embodied knowledge is conditioned by a specific context, acquired in the process of solving practical problems.	The work of specialist experts is the most important. Status and power based on professional reputation. Strong emphasis on training and qualifications	Assessment and development of individual competence. Replacement of a number of qualified people with computers operations.
organizations, dependent on analysts	Intellectual knowledge based on abstract thinking skills and cognitive abilities.	Solutions to innovative tasks. Status and power based on creative achievements. Project organization of work prevails.	Development of creative abilities and skills problem solving. Informational support and design of expert systems
Organizations Routine knowledge	Built-in knowledge contained in systems and procedures	As a rule, technological or labor-intensive. Hierarchical structure. Functional division of Labor	Organizational competence and strategies. Development of integrated computer systems
Organizations intensive communication	Key in the culture of knowledge, refers to the process of reaching a common understanding	Communications and cooperation in key processes. Increased capabilities based on integration. Knowledge and experience are important at all levels of the organization	Creation of knowledge, dialogue, collective process understanding. Development of computer systems support

The source was created by the authors based on [62]

At the same time, as the authors notes, in the course of the development of management thought, there is no complete abandonment of theories, the explanatory power of which decreases with the appearance of new concepts, that is, theories related to different periods that coexist quite successfully, mutually complementing each other [65].

The high turbulence of the external environment, connected, among other things, with the factors listed above, force companies to adjust their strategy and type of behavior, to ensure the creation of new and the development of existing competitive advantages that contribute to the growth of the company's capitalization level due to the effective management of its intellectual capital and development of dynamic capabilities of its organizational system. Effective management of an organization's intellectual resources is determined by its ability to optimally combine the processes of acquiring knowledge and technologies and its own production of knowledge that provides a competitive advantage. The business processes of the company differ in the degree of activity of working with knowledge. There are always jobs in the organization that require a large

amount of knowledge. Such business processes are called psychological, or actively work with knowledge. It is these processes that should be given primary attention when developing a company's knowledge management strategy.

2.2. Analysis of the competitive development of TNCs in the global knowledge market

It was determined that at the current stage the TNC market is characterized by hypercompetition, which manifests itself in global competition in the field of supply at the same time as the homogenization of demand, the growing polarization of markets, the blurring of industry boundaries, the growth of mechanization, and the active spread of information and communication technologies. By hypercompetition, we mean a situation where international companies are increasingly exposed to the combined influence of previously isolated competitive factors, which leads to the emergence of multifaceted, dynamic and aggressive competition. We note a number of characteristic features characteristic of the new competitive situation:

- covers several areas, the most important of which are: quality of manufactured products, costs, use of the latest technologies, creation of market barriers, strengthening of the company's financial position. In the new conditions, all the mentioned parameters must be taken into account by company management not separately, but simultaneously.

- TNCs are forced to take into account the multifaceted nature of hypercompetition. This means that, first of all, they compete with each other on different levels - not only in sales markets, but also in the field of innovation, intellectual, financial and natural resources. Secondly, the multifaceted nature of hypercompetition is manifested in the use of adaptive marketing approaches in different national markets. At the same time, the company's management must flexibly and mobile respond to the specifics of consumer behavior, take into account any fluctuations in demand.

- high dynamism of market processes, which involves the assessment of not only existing, but also future consumer requests. Companies must be ready to meet them before emerging trends become reality.
- growing aggressiveness of participants in the market space, the purpose of which is to disrupt the existing balance in the arrangement of competitive forces, to achieve competitive advantages over market rivals [68].

As for the driving forces of hypercompetition caused by the development of the knowledge economy, five main factors that collectively directly affect hypercompetition should be identified. The first driving force is the growing globalization of the world economy, the development of which from the point of view of the analysis of international competition takes place in two most important directions. On the one hand, there is globalization of competition in the field of supply: a constant increase in supply from globally operating product suppliers based on the international division of labor. On the other hand, the globalization of competition occurs through the homogenization of demand: the number of global consumers and sales intermediaries is constantly increasing. The demand for standard and unified products is increasing. Thus, the trend of forming a global segment of consumers has been successfully used by a wide variety of companies. Whirlpool, Sony and IKEA, for example, have benefited from the growing demand of the global middle class for kitchen appliances, consumer electronics and household items. Levi's, Nike and Sega have opened up the global youth market, and De Beers, Chanel, Gucci and Rolls Royce have successfully served the global market of elite consumers [65].

The second driving force of hypercompetition is the growing polarization of markets, which is expressed in the fact that some consumer segments increasingly prefer high-quality and expensive products, while others - the cheapest, ignoring products of average value. If in the mid-seventies of the XX century. the share of these categories of products in world demand was 28%, 23% and 49%, respectively, by 2010 these indicators are forecast at the level of 40%, 50% and 10%. The third driving force of hypercompetition is the process of blurring industry boundaries, which is also carried out in two most important directions. So, on the one hand, the boundaries between different industries are being blurred, their merger

is taking place (this is especially clear on the example of the banking and insurance business). On the other hand, intra-industry boundaries are disappearing due to mergers and acquisitions. Here we can cite an example with the automobile industry, where after the merger, the companies strive to produce almost the entire range of cars. The fourth driving force of hypercompetition is the growth of mechanization, the active spread of information and communication technologies, which allows the creation of powerful information and communication networks. The fifth driving force of hypercompetition is the strengthening of the process of market deregulation, caused, in particular, by the growing privatization of state-owned enterprises and the liquidation of monopolies [69].

The first sign of hypercompetition is the growing dynamics of market changes. The positions of competitors are constantly changing, radical transformations of market boundaries are constantly taking place, product life cycles and new technology development cycles are shortening. The second sign is a change in the nature of competitive advantages: a sustainable competitive advantage that provides the company with a leading position on the market for a long time is generally unattainable. Market competition has evolved from classical price competition to quality competition and then to competence competition. At the same time, competencies are understood as a set of interrelated skills and technologies. Also, a sign of hypercompetition is the growing aggressiveness of the participants in market competition, the unethical and uncivilized behavior of their behavior, direct attacks are conducted with non-compliance with legal regulations, with the aim of disrupting the balance in the distribution of forces of competitors [66]. Thus, the formation of a post-industrial society and globalization led to a modification of the competition mechanism, which manifested itself precisely in the emergence of hyper-competition, which is based on intense and aggressive rivalry based on innovations. Hypercompetition contributed to the fact that today science, information and knowledge become the basis of competitive advantages.

Currently, TNCs contribute to the formation of a new knowledge regime, which in turn affects the degree of sustainable development of countries, play a growing role in research and development (R&D), the production of technically more advanced products based on

them, in foreign trade operations, organization and training of the workforce. As a result, this has led to the fact that companies have recently begun to actively integrate into the system of transnational relations, in which TNCs play the most important role. If in the mid-seventies of the XX century. the share of these categories of products in world demand was 28%, 23% and 49%, respectively, by 2010 these indicators are forecast at the level of 40%, 50% and 10%. The third driving force of hypercompetition is the process of blurring industry boundaries, which is also carried out in two most important directions [70].

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Regarding R&D, it is appropriate to note that currently, the share of corporate expenditures in national R&D expenditures exceeds 65%, and on average in the countries of the Organization for Economic Cooperation and Development (OECD), it reaches 70% 1. According to annual estimates of EU experts, in In 2011 , the world's 1,500 largest companies invested more than 510.7 billion euros in R&D, which was 7.6% more than in 2010 [71]. At the same time, the share of investments by American companies in this volume was 34.9% (503 companies invested 178.4 billion euros, exceeding by 9% the level of the corresponding indicator of 2010), EU companies - 28.3% (405 enterprises - 144.6 billion euros, which is 8.9% more than the indicator of 2010), Japanese companies - 21.8% (296 enterprises - 111.5 billion euros, which exceeded the 2010 figure by 1.7%), companies from other countries - 14.9% (296 enterprises - 76.2 billion euros, which is 11.4% more than the 2016 figure)[72].

In 2020, the ten largest innovative companies, according to experts, included eight American companies, including Apple with R&D expenditures of \$2.4 billion, Google - \$5.2 billion, ZM - \$1.6 billion \$3 at the same time, world leaders in R&D spending in 2020 were Toyota (\$9.9 billion), Novartis (\$9.6 billion), Roche (\$9.4 billion), Pfizer (\$9.1 billion), Microsoft (\$9.0 billion). The amount of investment by American big business in R&D in 2020 is estimated by experts at \$255.9 billion. or 63.5% of total US R&D spending. At the same time, more than 75% of corporations' R&D expenditures are attributed to the chemical industry, developments in the field of electronic and computer products, aerospace and defense developments, the automotive industry, as well as the development of software products and R&D services [73].

Analyzing the patent market, it should be noted that according to experts, TNCs are the main participants in the international trade in patents and licenses, while the USA, the countries of the European Union, Japan and Switzerland account for about 90% of the export of intellectual property objects, while in the USA, Germany, Great Britain and a number of other countries the balance of trade in the field of intellectual property is positive, and in Japan, receipts from the export of technology exceed payments for imports more than five times. As can be seen from the infographic, in the period from 2006 to 2018, a steady increase in patent registrations was observed, primarily in 63 Asian countries (Japan, Korea and China), in which the main part of all patent applications in the world are registered during this period. According to WIPO data, in 2006, the organization received 49.7% of applications from this region out of the total number of analyzed macro-regions, and in 2016, 64.%. In the shorter time period of 2016-2018, positive dynamics are even more pronounced for the countries of Asia (2.5% growth in two years), with a decrease of 1.5% in the countries of North America and 0.4% in the countries of Europe for the same period .

Table 2.6

Ranking of TNCs of the world by the number of received patents

No	Company	Year 2008	Year 2016	Year 2017	2022	Branch
1.	IBM	4,169	8,090	9,043	9,100	Informational Software

2.	Samsung	3,502	8,470	8,894	5,850	Electronics, information technologies
3.	LG Electronics	805,000	4,013	4,469	2474	Electronics, information technologies
4.	Intel	1,772	3,080	3,435	2735	Semiconductor equipmen
5.	Canon	2,153	3,665	3,285	3056	Clear machine construction
6.	Alphabet	-	3,219	2,709	2070	Internet and software
7.	Qualcomm	309	2,925	2,628	2300	Communication technologies
8.	Toyota Motors	387	1,877	2,446	1959	Automobile industry
9.	Microsoft	2,043	2,410	2,441	2353	Software
10.	Taiwan Semiconductor Manufacturing	365	2,288	2,425	2465	Semiconductor industry
11.	Sony	1,461	2,298	2,331	1688	Electronics, finance
12.	Apple	185,000	2,103	2,229	2160	Electronics, information technologies
13.	Toshiba	1.57	2,437	2,073	-	Conglomerate
14.	BoE Systems	-	1,340	1,999	1634	Electronic technologies
15.	Amazon.com	-	1,672	1,963	2035	Retail
16.	Mitsubishi	2,043	1,701	1,916	-	Automobile industry
17.	Ford Motor	336,000	1,525	1,868	2123	Automobile industry
18.	Panasonic	1,760	1,977	1,787	-	Electronics, information technologies
19.	General Electric	1,243	1,871	1,871	1597	Automobile industry
20.	Huawei Technologies	-	1,353	1,616	1680	Electronics, information technologies

Source : created by the authors based on [74]

From 2016 to 2020, the structure of international production has radically changed, which is reflected in the growth of the number of companies working in the field of ICT. Yes, if in 2017 the leading place by market capitalization was occupied by companies working in the banking, energy and oil industries, such as: «PetroChina», «Exxon Mobil», «General electric», «Industrial and Commercial Bank of China». Whereas, already in 2020, they were replaced by the manufacturers of computers, audio players, phones and software «Apple», «Google», «Microsoft», «Sumsung», as well as «Amazon» - the world's largest sales company goods and services using the Internet, the assets of which increased by an average of 65% [75].

It should be noted that the largest digital multinational corporations (TNCs) with a total market value of \$2.8 billion. Located in North America, with about 67% of parent

companies and nearly 40% of their subsidiaries located in the US. A key role in strengthening the growth of e-commerce platforms in the Asian ICT market is played by the Chinese company «Alibaba», which interacts with customers in more than 200 countries and successfully competes with the American companies «Amazon» and «eBay» . In Europe, twenty-seven companies work in the field of ICT, while other companies are engaged in traditional industries: agriculture, mining and processing industry. It should be noted that unlike the global trends of information-based business development, private companies belonging to the mining and metallurgical and fuel and energy complex dominate in terms of capitalization in Ukraine. Also, the low development of digital platforms in the field of digital government formation and business entrepreneurship as a whole is observed, which is caused by the lack of a comprehensive approach to the formation of the ICT services market.

Africa and Latin America account for less than 2% of the total market value of the largest companies by capitalization level, so they have practically no influence on the global ICT market (Table 1). Analysis of the ICT market by country shows that the highest share of income from this sector is observed in Great Britain (12.4%), China (6.9%), India (5.6%), Japan (5.6%), the USA (5.4%) and Germany (4%), and these countries are the leaders of the world economy in terms of GDP. At the same time, France, Italy, Brazil receive relatively low income from the information sector, which is an average of 3% of GDP, which significantly affects the distribution of ICT in the world. The uneven development of the ICT market is also evidenced by the ranking of countries on digital competitiveness. Thus, the first three places are occupied by Singapore, Sweden and the USA, which is connected with the high level of training of specialists, the development of technologies and the readiness of the population for their implementation [76].

However, the development of the ICT market in the USA may be suspended by the stagnation of the economy and the growing influence of Asia, which has strong competitive advantages and potential for the development of the information space. Among the countries with the greatest progress in digital competitiveness in the period from 2014 to 2016, it should be noted that China and India improved their positions in the rating from 38 to 31

place and from 56 to 51 place, respectively, which is associated with promising opportunities in the markets sales and innovative technologies. Despite the high indices of digital competitiveness, European countries are losing their positions in the ranking, which is connected with the exit of Great Britain from the EU and the uneven development of the ICT market. Thus, France uses the digital potential at the level of 12%, Germany - 10, and Great Britain - 17%, while their tendency towards growth is insignificant, the reason for which is the state of digitization in various sectors of the economy. The share of the digital economy in Ukraine is 2%, which corresponds to the characteristics of developing countries.

Table 2.7

**Distribution of the world's largest TNCs
in the field of providing computer services for 2012 – 2019**

No	Company	Country	Profit (US\$ billion)	Market value (US\$ billion)	Income (US\$ billion)			
					2012	2014	2016	2019
1.	Alphabet	USA	16.6	766.4	37.91	55,52	74.99	117.9
2.	IBM	USA	5.7	132.3	-	-	-	80.1
3.	Facebook	USA	17.8	541.5	3.71	7.87	17.93	44.6
4.	Tencent Holdings	China	10.6	491.3	4.38	9.29	15.81	35.3
5.	Accenture	Ireland	3.6	101	25.51	28.56	31.05	39.1
6.	Baidu	China	3.5	94.1	2.23	4.91	10,20	13.4
7.	Tata Consultancy Services	India	4	98.4	-	-	-	19.1
8.	Cognizant	USA	1.5	1.5	-	-	-	15.2
9.	RELX Group	United Kingdom	2.1	43.4	-	-	-	9.5
10.	Infosys	India	2.5	38.3	0.09	0.11	0.13	10.9
11.	Capgemini	France	925	23.3	-	-	-	14.4
12.	NetEase	China	1.6	35.2	1.12	1.41	3.50	8
13.	ATOS	France	678	13.9	-	-	-	14.3
14.	Wipro	India	1.2	18.3	-	-	-	8.5
15.	CGI Group	Canada	814	17.2	-	-	-	8.7
16.	Samsung SDS	South Korea	0.469	16.2	4.46	6.60	7.35	8.2
17.	Naver	South Korea	0.659	22.1	1.99	2.11	3.05	4.4
18.	NEXON	Japan	0.753	12.2	-	-	-	2.3
19.	Iliad	France	0.449	11.8	-	-	-	5.6

20.	Nomura Research Institute	Japan	0.498	12.5				4.3
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Source : created by the authors based on [77].

The uneven development of the ICT market is also evidenced by the ranking of countries on digital competitiveness. Thus, the first three places are occupied by Singapore, Sweden and the USA, which is connected with the high level of training of specialists, the development of technologies and the readiness of the population for their implementation. However, the development of the ICT market in the USA may be suspended by the stagnation of the economy and the growing influence of Asia, which has strong competitive advantages and potential for the development of the information space. Among the countries with the greatest progress in digital competitiveness between 2016 and 2020, it should be noted that China and India improved their positions in the ranking from 38th to 31st place and from 56th to 51st place, respectively, which is associated with promising opportunities in the market sales and innovative technologies. Despite the high indices of digital competitiveness, European countries are losing their positions in the ranking, which is connected with the exit of Great Britain from the EU and the uneven development of the ICT market [78].

Thus, France uses the digital potential at the level of 12%, Germany - 10, and Great Britain - 17%, while their tendency towards growth is insignificant, the reason for which is the state of digitization in various sectors of the economy. The share of the digital economy in Ukraine is 2%, which corresponds to the characteristics of developing countries. Regardless of the fact that the ICT market in the countries of Europe, North America and Asia has growth trends and almost complete digitization of the economy, Africa and Latin America remain at a low level of ICT development. Remote areas of Africa such as the Democratic Republic of the Congo, Cameroon, Gabon, Ethiopia, Somalia, Kenya, Uganda, Namibia, Botswana and Zimbabwe face problems of underdeveloped infrastructure and lack of financing due to the fact that investors do not expand Internet connections communication in rural areas due to low income [79].

For the development of the ICT market in Africa, it is advisable for developed countries to provide support to poor countries, which will reduce the digital divide between countries. In turn, the growth of the ICT market in the countries of Africa and Latin America is influenced by the activities of such international organizations as the United Nations Conference on Trade and Development (UNCTAD), the European Information Technology Supervisory Commission (EITO), the McKinsey Global Institute, the International Telecommunication Union (ICE), the International Monetary Fund (IMF) and the International Institute for Management Development. Cooperation between developed and developing countries, as well as international organizations based on the results of ICT market research, will determine the success of global initiatives to reduce the digital divide. The model for improving the ICT market in developing countries in accordance with world trends should include the following areas: the formation of a business environment in which companies could fully use the Internet's capabilities for competition and innovation; employers and employees must have the necessary skills to be able to use the digital world [80]. It was found that Asian countries have unconditional advantages in the development of the ICT market due to their influence on the international economy through the export of technologies and the expansion of electronic commerce.

The slowdown in the development of the digital technology market is observed in Europe, which is associated with the full coverage of the Internet, the weakening of positions due to the exit of Great Britain from the EU and high dependence on ICT imports from the USA. Africa has digital potential, but it is considered only as a potential market for the sale of products of developed and developing countries. Without the support of other countries and international organizations, the development of the ICT market in Africa and Latin America will not take place, which will lead to an even greater increase in the gap between developed and poor countries, conflicts and uneven distribution of resources in the world. It has been proven that the improvement of the management mechanism in the field of the ICT market will increase the competitiveness of not only countries, but also regions as a whole, which will lead to an increase in the standard of living in the world.

Table 2.8

Investment-active TNCs of the world according to the CG edition B by the level of R&D expenditures in %

No	Company. Branch	Country	Innovative activity. Change in R&D spending %			
			year 2013	2014 year	2015 year	2016 year
	Automobile industry					
1.	Tesla	USA	-15.3	100.3	54.5	16.2
2.	Daimler	Germany	-1.7	10.5	5.3	10.5
3.	Renault	France	-5.4	-5.0	20.6	14.2
	Industrial products					
4.	Siemens	Japan	-4.4	10.3	5.6	0.4
5.	BASF	Germany	5.1	2.7	3.7	-4.6
6.	Dow Chemical	USA	2.2	-5.6	-3.0	-0.9
7.	3M	USA	5.0	3.2	-1.1	-0.9
8.	DuPont	USA	4.2	-4.0	-8.2	-13.5
9.	Philips	Netherlands	-5.1	-6.8	19.4	3.9
	Media and entertainment					
10.	Netflix	USA	15.1	24.7	37.8	30.9
	Retail					
11.	Amazon	USA	43.8	41.3	35.2	28.3
12.	Alibaba	USA	35.7	109.3	29.4	23.7
13.	Unilever	Netherlands, Great Britain	-	-	5.2	-2.7
14.	Adidas	USA	-	-	10.3	18.0
15.	Nestlé	Switzerland	-2.7	8.3	3.1	3.5
	Health care					
16.	Johnson & Johnson	USA	6.8	3.8	6.5	0.5
17.	Bayer	Germany	5.9	12.0	18.0	8.7
18.	Pfizer	USA	-10.8	9.1	6.9	2.5
	Information Technology					
19.	Apple	USA	32.4	35.0	33.5	24.5
20.	Google	USA	20.0	24.3	24.9	13.6
21.	Microsoft	USA	6.1	9.3	5.8	-0.5
22.	Samsung	South Korea	24.2	0.5	-4.7	3.0
23.	Facebook	USA	1.1	86.9	79.5	23.3
24.	IBM	USA	-1.2	-12.7	-3.5	9.6

25.	Hewlett-Packard	USA	-	-	-	-1.7
26.	SAP	Germany	0.1	3.5	22.1	7.0

Source: created by the authors based on [80]

Considering the peculiarities of the development of TNCs, the factors of transnationalization of corporations in Japan and the countries of Southeast Asia differ, which to some extent affected the territorial coverage of their activities. Since the 1980s, the expansion of Japanese TNCs into developing countries (63% of foreign branches) began, as these countries allowed the transfer of ecologically «dirty» productions to them and were characterized by relatively cheap labor costs and the number of raw material sources (Rebra, 2015). Therefore, in order to minimize production costs, Japanese TNCs willingly did business in such countries, including East Asia (43% of TNC branches). The location of production in developed countries (USA, EU) served mainly to overcome protectionist trade barriers that these countries sometimes used (Hollerman, Myers, 1996). International alliances and M&A agreements as a way of transnationalizing. Japanese business have been widely used since the 1990s. This has stimulated a large flow of Japanese investments into developed countries. The 2000s were marked by the dynamic transnationalization of corporations employed in the tertiary sector of the economy, for example in the field of telecommunications. There were other motives and reasons behind the processes of transnationalization of companies in developing countries. Corporations of the countries of Southeast Asia work in those areas, the products of which are most profitable to sell in countries with a high standard of living (restaurants, food, beverages, real estate). Achieving profit maximization in this niche is easier in countries with high population incomes and stable solvent demand. Poor countries with a low level of economic development will not be able to ensure maximum profitability for such products and services. The factor of saving production costs is, of course, still important, but they are usually relatively low in all developing countries (taking into account the specifics of the availability of certain resources).

The presence in the markets of more developed countries also increases the quality of management, technologically modernizes and improves the developing corporations in various directions. Therefore, corporations of developing countries aim for global coverage of their business, however, such a situation can lead to the effect of diverting investment flows from the region and, as a result, «the risk of insufficient intra-regional investment», in particular in Southeast Asia (Mishchenko, 2020). The least economically developed countries of the region, such as Cambodia, Laos, and Myanmar, whose financial receipts from the outside still partly consist of official development aid, such as Japanese (Lebedeva, 2014), are losing opportunities to attract capital investments in the form of investments, while corporations of their of the region in investment strategies leave them without attention. Thus, Laos, Cambodia, and Myanmar receive a total of no more than 0.5% of Singapore's direct outward investment. An analysis of Singapore's investment activity points to the problem of insufficient investment by corporations from Southeast Asian states in the region's poorest countries. In 2017, 17.3% of Singaporean FDI was directed to China, 14.6% to EU countries. Among the countries of the subregion, the largest investments in Singapore attracted more developed and favorably developing countries: 7.7% of FDI was directed to Indonesia, 5.5% to Malaysia, 3.2% to Thailand.

As for the USA, it should be noted that American TNCs increasingly act as a source not only of capital, but also of other significant assets - management methods and production technologies. At the current level of development of international economic relations, transnational corporations in general and US TNCs in particular are one of the main sources of innovation for recipient countries. Transfer and dissemination of technologies is carried out by TNCs of the USA, as a rule, on an intra-corporate and commercial basis.

Table 2.9

A place in the world	TNCs of Asian countries	Country	Investment spending (billions of US dollars)	R&D intensit %	Branch
1.	Sinopec	China	0.2	2.8%	Oil production, gas production, oil refining
2.	PetroChina	China	1.9	0.6%	Oil production, gas production, oil refining
3.	ICBC	China	-	-	Financial services
4.	China State Construction Engineering	China	1.9	1.2%	Construction
5.	China Construction Bank	China	-	-	Financial services
6.	Ping An Insurance Group	China	-	-	Financial services
7.	China Mobile	China	-	-	Telecommunications
8.	Reliance Industries	China	0.3	0.6%	Conglomerate
9.	Alibaba Group	China	3.6	14.4	Retail
10.	Tencent Holdings	India	2.7	7.3	Retail
11.	Midea Group	China	1.3	3.5	Electronics
12.	Country Garden Holdings	China	-	-	Conglomerate
13.	SF Holding	China	0.1	1.1	Express delivery services
14.	Inner Mongolia Yili	China	-	-	Dairy products
15.	NetEase	China	0.7	8.1	Internet
16.	Sun Pharma Industries	India	-	-	Pharmaceutics
17.	Foshan Haitian Flavoring and Food	China	-	-	Food
18.	Jiangsu Hengrui Medicine	China	0.3	12.7	Pharmaceutics
19.	Orient	Japan	-	-	Production of watches
20.	Chiba Bank	Japan	-	-	Financial services

Source: created by the authors based on [81]

In order to improve the efficiency of financial and economic activities, US multinational companies currently use two main approaches to reform: a process approach and an approach based on improving business knowledge management systems, also known as knowledge management. The application of the process approach is based on the theory of optimization of the chain of creation of added value and involves, first of all, the

selection of the main and auxiliary business processes, a significant increase in the quality of the products produced, organizational restructuring and optimization of the logistical connections of process flows.

The management of business knowledge involves the development and reformation of the activities of US companies based on the wide application of information and databases in the field of business competence, as well as the formed practice of its organization, which were accumulated in the company itself and / or were available to it from external sources. The implementation of knowledge management systems in American firms allows not only to efficiently accumulate the necessary information resources, but also to provide them in a timely manner to those divisions where they are in demand, thereby creating unique strategic competitive advantages.

The quality of knowledge and knowledge management systems used by US companies directly affects the optimization of business processes and increases the overall efficiency of the functioning of American firms in the field of management decision-making, organization of innovative activities and professional training of employees of US companies. The implementation of new approaches to the organization of the activities of American companies is implemented with the help of two main strategies - reengineering and restructuring.

As part of reengineering, a quick and deep redesign and reconstruction of existing business processes of US companies is carried out, and a new optimization model of their horizontal and vertical compression (economy) is created. Due to this, the functional structure of companies is optimized with the aim of reducing the duration of the production cycle of companies, reducing personnel, optimizing the structure of the company's resource consumption, increasing the adaptability and efficiency of its activities, streamlining relations with partners -customers, suppliers, intermediaries and competitors and, as a result, increasing efficiency of financial and economic activity of enterprises [82].

Restructuring of American companies involves improving the organizational management structure, dividing specialized and non-specialized divisions, modernizing, replacing or reducing the existing production and technological base of enterprises,

significantly changing the management system and the use of human resources, finding optimal forms of work with the target client group or creating a new one. During the restructuring, there is a transformation of the organizational structure and management structure of US multinational companies, the structure of distribution and delegation of powers from management levels.

At the same time, if in the 1980s, during reform, US companies focused on improving the quality of manufactured products, the 1990s were an era of reengineering and restructuring, then the 2000s will determine competitive advantage primarily due to speed of adaptation, change and reform. The phenomenon of intensification of organizational and process dynamics is a direct consequence of intensifying competition on the US market and on the world market, and at the same time is the most important factor in ensuring a high competitive position of the firm at the local and global levels.

There are changes in consumer preferences and, as a result, active innovation in the products of American manufacturers. There is a shortening of the life of the product offered on the US market, which is accompanied by a change in consumer expectations regarding product quality, based on offers of higher quality by foreign companies - competitors.

Organizational dynamics in American companies more and more adequately reflect the development needs of US companies and contain the optimal structure and number of management levels. The management structure provides a personnel reserve of young employees for training future managers. The principle of separation of competencies and coordinated actions determines the optimal combination of functions of line management and the work of the company's functional divisions. Flexibility and dynamism of development of advanced American companies and is achieved due to the introduction into the organizational structure of subjects of intra-corporate interaction in the form of committees, working or project groups, etc., which contribute to the development of personal contacts and initiative on the part of the company's employees. Bench-marking methods are also actively used, which is connected with the constant study of organizational and management experience in competing companies with the aim of applying their most advanced methods and achievements [83].

Modern approaches and strategies of reforming American companies are closely related to the use of new information and communication technologies. New information and communication technologies are a significant factor and an effective tool for the development and reform of US TNCs. American companies strive to create an effective communication system that would ensure clear transmission of information. The formation of a large-scale information infrastructure during 1980-2005 made it possible to turn new information technologies into an effective tool for increasing the efficiency of the financial and economic activities of US enterprises. Since the second half of the 1980s in the USA. Capital investments of US companies in communication equipment, computer technologies and software for data processing in the period 1988-2003 tripled and by 2004 exceeded 1,333 billion dollars, which created a solid basis for successful reform and improvement of the management of American companies.

On the basis of the above, it can also be confidently assumed that the study of the main directions and strategies of development and reform, as well as the experience of improving American TNCs, is of undeniable interest for German companies and organizations, both those that appeared as a result of the reform of the German economy, and for large system-forming enterprises and holdings - a kind of organizational heritage of the command economy. Obviously, German companies of the first group can now gradually switch to purposeful management of business processes and start implementing elements of knowledge management systems. On the contrary, organizations of the second type - large holdings - face the need for deep reformation through restructuring or reengineering of business processes to increase the efficiency of their activities and bring management structures and their functions into line with the new realities of the market economy.

Western European corporations, in the period of their formation, differed in their tendency to oppose each other, but in recent years, the tendency to unify European TNCs in the face of American, Japanese, etc. Rivals In Europe, the wave of corporate mergers and acquisitions is growing rapidly, but if earlier the majority of mergers of continental European firms were carried out with European companies, then at the beginning of the

XXI century, Western European transnational corporations play a dominant role in interfirm associations around the world. The European Union has become the largest exporter and importer of capital, and the role of TNCs in these processes is crucial, especially in the field of foreign direct investment.

Table 2.10

Rating of innovative companies of the USA for 2015 and 2018

Place in the world no	TNC USA	Investment spending (billions of US dollars)	R&D intensity %	Branch
	Amazon.com, Inc.	22.6	12.7%	Trade
	Alphabet Inc.	16,23	14.6%	Software
	Intel Corporation	13,10	20.9%	Informatics technology
	Microsoft Corporation	12.29	13.7%	Software
	Apple Inc.	11.58	5.1%	Electronics, information technologies
	Johnson & Johnson	10.55	13.8%	Pharmaceuticals, biotechnology and life sciences
	Merck & Co., Inc.	10,21	25.4%	Pharmaceuticals, biotechnology and life sciences
	Ford Motor Company	8.00	5.1%	Automotive industry
	Facebook, Inc.	7.75	19.1%	Software
	Pfizer Inc.	7.66	14.6%	Pharmaceuticals, biotechnology and life sciences
	General Motors Company	7.30	5.1%	Automobile industry
	Oracle Corporation	6.09	16.1%	Software
	Cisco Systems, Inc.	6.06	12.6%	Technical equipment
	Celgene Corporation	5.92	45.5%	Pharmaceuticals, biotechnology and life sciences
	International Business Machines Corporation	5.79	7.3%	Software
	QUALCOMM Incorporated	5.47	24.5%	Semiconductor equipment
	Eli Lilly and Company	5.28	23.1%	Pharmaceuticals, biotechnology and life sciences
	AbbVie Inc.	4.98	17.7%	Pharmaceuticals, biotechnology and life sciences
	Bristol-Myers Squibb Company	4.82	23.2%	Pharmaceuticals, biotechnology and life sciences
	General Electric Company	4.80	4.0%	Goods

Source : created by the authors based on [85].

A characteristic feature of the changes taking place in the field of R&D is that they are primarily aimed at increasing the role of the private sector, at the forefront of which are

transnational corporations. The governments of the EU countries are strengthening the policy of stimulating private research works by redistributing a significant share of public funds allocated for R&D to the private sector, by supporting individual research programs and adopting protective measures aimed at preserving the innovative advantages of national TNCs. The implementation of the unified scientific and industrial policy of the European Union is financed more weakly than national programs, but the former plays the role of a catalyst in the cooperation of the activities of transnational corporations and state research institutes.

In the countries of the European Union, a whole system of forms and methods of influence of transnational corporations on governments has developed in matters of economic policy formation and implementation. These processes are especially evident in Great Britain and Germany. These countries are characterized by a closer relationship between representatives of transnational capital and authorities than is observed in other EU states. Semi-governmental organizations, organizations of business circles, chambers of commerce and industry play a significant role in this system.

In the conditions of the development of the knowledge economy, assets based on knowledge are turning into a key factor in the development of TNCs. Accordingly, a company's ability to manage its intellectual capital is one of the defining competencies that enable it to deliver increased value to business owners. Thus, the prospects for the development of TNCs in the knowledge economy largely depend on their ability to manage intellectual capital. Due to the fact that the share of tangible assets in the market capitalization of companies in developed markets decreased to 16% by the beginning of the 2010s (at the end of the 2000s it was 52%), the relevance of the study of intellectual capital as a key factor in the success of transnational corporations will only grow. It is obvious that in different industries the degree of influence of individual elements of intellectual capital on the performance of TNCs will be different, because even in developed markets, intellectual capital can play a various roles in the activities of transnational corporations.

2.3. Analysis of competitiveness of Ukraine in the knowledge economy

The formation of the economy at the regional level as a fundamentally new system of socio-economic organization is due to the special role of knowledge in modern civilizational development. The development of the regional knowledge economy is determined by the action of a number of factors: human, which determines socio-economic relations; technological, which is intensively developing under the influence of science; information that generates, redistributes and accumulates new knowledge. For countries that have limited natural resources, the only rational solution to this problem is the development of more effective methods of using the existing potential. This potential can include intellectual capital, which will later be a source of economic development of society. One of the most effective methods of using human capital is the economy based on knowledge. Undoubtedly, Ukraine belongs to countries with limited access to resources. However, the difference between Ukraine and other «semi-periphery» countries lies in the development of a large materialized resource potential during the years of existence as part of the USSR. At the same time, it is appropriate to note that the Soviet Union, together with the USA, Germany and Japan, was a leading country in the formation of the third technological order [73]. However, the imperial nature of the state, revolutions, and world wars led to the fact that already at the fourth technological stage, the USSR's backwardness became noticeable, and by the time of the transition to the sixth, it was catastrophic. In the prerequisites for the formation of the «knowledge economy», Ukraine possessed potential and opportunities that were significantly superior to other union republics. At its disposal was a centuries-old tradition of education and scientific activity, creative business ethics rooted in the mentality and national psychology, a developed system of education and scientific research, a powerful potential of science-intensive (according to the criteria of the second half of the last century) production. Rockets, airplanes, antibiotics, and computers were developed in Ukraine. But the reforms of the last years of the existence of the USSR and the first decades of independence, instead of leading to the strengthening of the economy against the background of the necessary political and social reforms, the

restoration of one's own independent statehood, led, in many respects, to the opposite consequences.

The contradictory logic of the formation of the knowledge economy in Ukraine in the post-Soviet period is associated with a long period of decline as a result of ineffective liberal market reforms and an uneven movement in the mode of catch-up development in relation to the leading economies of the world. Therefore, the Ukrainian economy is going through the post-industrial and informational stages, characteristic of developed countries, at an accelerated pace, which complicates the adaptation of the institutions of the knowledge economy and reduces their effectiveness [86].

Modern problems of the economic development of the regions of Ukraine are connected with the formation of a new paradigm of scientific and technical development. The components of the new economy are innovations, the growth of the social orientation of the technologies being created, the general nature of the availability and use of knowledge, technologies, innovative products and services. That is, the long-term competitiveness of the regional economy is ensured by the transition to the «knowledge economy», the priorities of which are the development and spread of information technologies, as well as the development and wide implementation of innovations and investments in the formation of human capital. Building a knowledge economy in Ukraine is determined by the main way of increasing the competitiveness of both individual regions and countries, ensuring a new quality of life for the population. The ability of the region to produce knowledge, in particular scientific knowledge, to implement it and effectively use it to achieve effective socio-economic development are now the main factors that ensure the positive dynamics of the economic development of the regions along with traditional sources - investments and human labor.

It should be stated that there are certain state actions in the direction of the «first approximation» to the formation of a knowledge economy in Ukraine: the transition to an innovative, socially oriented type of economic development of the country is declared in the vectors of economic development of Ukraine 2030; Priority directions for the development of science, technology and engineering in Ukraine were approved, the State

Program of Ukraine «Development of Science and Technology» for 2020-2030 was adopted. ; supporting elements of national and regional innovation systems have been created. At the same time, the key problem remains the lack and incompleteness of institutional support for the scientific and educational complex and innovative and active business - clear rules, flexible regulatory mechanisms, a system of budgetary priorities, etc [87].

Institutes of the knowledge economy are designed to ensure a strong connection and sustainable interaction of business entities in the processes of generation, distribution, use, commercialization and capitalization of knowledge. In this regard, we will present the authors's vision of the strategic directions and trajectory of the institutional development of the knowledge economy in Ukraine.

The most significant institutional problems of implementing the knowledge economy model in modern conditions include:

- in the field of knowledge generation - lagging behind the level of remuneration of science and education workers from the economy average; deformed motivation of professors and teaching staff (shortage of time for scientific research due to «overemployment» on a part-time basis); insufficient financing of state scientific funds and lagging behind developed countries in the amount of grant support of the GDR; preservation of the language barrier and underdevelopment of international research projects; low prestige and image of the natural science fields of bachelor's and master's training;

- in the field of commercialization - a deficit of the infrastructure of venture financing and the transfer of innovations; low level 13 (202) - 2013 20 Priorities of Germany of legal literacy of researchers and inventors in the field of protection and transfer of intellectual property rights, underdeveloped competencies of business planning, marketing and industrial design; predominance of GDR of an incomplete cycle, the product of which is an experimental sample; inconsistency of interests and asymmetry of information of subjects in the scientific and investment spheres;

- in the field of implementation — inertia, low demand for innovative developments on the part of large business and the ineffectiveness of tax instruments for its stimulation; the uncertainty of the legal status of innovatively active enterprises and the lack of comprehensiveness of their support; fierce competition in the markets for high-tech products and a shortage of marketing support for science-intensive businesses at the federal and regional levels

At the beginning of the 20th century, one should analyze the development of information and communication technologies, which significantly affect the development of intellectual capital. According to the international organization, Ukraine lags behind developed countries in the level of ICT development, which is explained primarily by the low level of development of innovative infrastructure, inadequate funding of scientific research activities, the unpreparedness of the population and business structures for the creation and use of new information and communication technologies. In this regard, a low level of use of personal computers, the Internet, and mobile communications is observed compared to other countries. According to the State Committee of Statistics of Ukraine, the total number of Internet subscribers in 2019 was 27,970.1 thousand, with 79.2% of them being home users, in 2010 – 3661.2 thousand, of which 83.7% are home subscribers [88].

It should be noted that Ukraine has quite high rates of Internet development compared to other European countries. At the same time, 56% of the Internet audience were men, 44% were women. People aged 15-25 use the Internet the most - 36%; least of all - people of retirement age - 4%.

Unfortunately, at the beginning of the 21st century, Ukraine ranks 89th out of 139 countries in terms of competitiveness, 83rd in the technological readiness index, and 90th in the network readiness index (although at the end of 2018, it was 62nd), according to readiness for the introduction of ICT - the 122nd position out of 138 countries, but regarding the use of ICT by the government in the 75th place out of 138 possible positions.

Analyzing the level of education, it should be noted that there are two oppositely directed processes in the knowledge economy. On the one hand, the production of

fundamental knowledge, which is concentrated in a few centers, on the other hand, applied knowledge and its consumption instantly spread all over the world. Producers of fundamental knowledge are five countries of the world - USA, Japan, France, Great Britain and Germany. The largest scientific centers are also concentrated in the producing countries. The world-famous centers of knowledge production are the states of Massachusetts and California in the USA, the university cities of Cambridge and Oxford in Great Britain, and Paris in France. Today, 25% of labor resources are employed in the field of science and high technologies in developed countries. About 40% of global research and development (R&D) spending is in the US. The share of private capital in R&D financing in EU countries reaches 55%, and in the USA - 67%.

Australia, Finland, South Korea, Taiwan, Singapore, etc. have been added to the traditional producers of knowledge in recent years. Countries such as Malaysia, China and Chile are making rapid progress in implementing a coherent strategy to create opportunities for the country to generate, acquire and use knowledge. Therefore, it is not surprising that much attention is paid to raising the educational level of the population in highly developed countries. Currently, many countries (Germany, the USA, Japan, etc.) are introducing universal higher education, which directly contributes to increasing the intellectual potential of the country as one of the main production factors[82].

Ukraine, unlike developed countries, did not take responsibility for solving the problems of education development - the main factor of production, the formation of a quality workforce. It is not surprising that in the countries of the so-called «golden billion», from 40 to 60% of employees have higher education, while in Ukraine - only 20.7%, and in rural areas - 8.2%. It is noteworthy that over the past twenty years, Ukraine has had extremely high rates of growth in the number of students. If in the 1995/96 academic year the number of students of higher education institutions of the I-IV levels of accreditation was 1.5 million, then in the 2017/18 academic year it was 6.8 million. However, due to the demographic crisis, it further decreased and amounted to 2.6 million people in the 2009/10 academic year.

Undoubtedly, in market conditions, the development of education is affected by demand. However, the amount of funding is also of great importance. Recently, the absolute and relative indicators of education funding have been increasing. If in 2000 the total expenditure on education amounted to UAH 7,085 million, then in 2019 it was UAH 66,773.6 million, which is 9.4 times more. The value of GDP during this period increased from 4.2% to 7.7%. The share of GDP for higher education also increased significantly, reaching 2.3% in 2019. But this is much less than in other European countries (for example, in Iceland the similar indicator reached 8.4%, in Denmark - 7.1%, in Sweden - 7 %). Underfunding of education by the state in Ukraine negatively affects its economic development [83].

Since gaining independence, Ukraine has turned into a stable donor of intellectual resources for the developed countries of the world (USA, Israel, Germany, Canada, etc.). From 2002 to 2019, 974 leading scientists left the country, 60% of whom were doctors of physical, mathematical, medical and technical sciences.

Among these concepts of knowledge economy assessment, the most comprehensive and accessible approach, in our opinion, is the Knowledge Assessment Methodology (KAM), developed by the World Bank. The main assumption of the methodology is that the construction of a national knowledge economy is based on the economic and institutional regimes of the country, an effective innovative system of education and the quality of human capital, and finally, modern information and communication infrastructure. The essence of the application of the KAM methodology is that with its help it is possible to determine the Knowledge Index (KI) and the Knowledge Economy Index (KEI) for different countries and create the corresponding rankings.

The main research conducted in relation to the knowledge economy is devoted to the assessment of this phenomenon at the national level, which is connected with the complexity of data collection in the regional section. To solve this kind of problem, the European Commission developed a set of regional innovation scoreboard (RIS) indicators, which can be adapted to evaluate the knowledge economy in the regions of Ukraine, using the given set of KAM (Table 3.1).

Table 2.11

Adapted structure of variable values of the Knowledge Economy Index*

Value group (sphere)	Variable values (Indicators)
General indicators of the development of regions	Annual growth rate of gross regional product, %; The value of the gross regional product per capita, UAH 000/capita.
Provision of quality education and development of human capital	Index of education according to the method of calculation Index of the development of human potential The ratio of the number of persons obtaining secondary education to the total number of persons studying The ratio of the number of persons obtaining higher education to the total number of persons studying
Effective information and communication infrastructure	Provision of telephone sets (main telephone sets of the city and rural network) The number of personal computers per 1,000 persons. in households The number of Internet users per 1,000 inhabitants.
Effective scientific and innovative system	The number of scientific employees per 10,000 people; The number of applications for obtaining security documents per 1 million people

Source: created by the authors on the basis of [84]

In order to better understand the situation regarding the level of development of the knowledge economy in the regions of Ukraine, it is necessary to combine the knowledge index, which is related to innovations, education and information and communication technologies and measures, accordingly, the ability of countries to apply, create and spread knowledge and the economy index of knowledge, which is an extension of the knowledge index and also takes into account the ability of countries to create conditions for progressive development of knowledge, including indicators of the group «economic incentives and institutional regime». The purpose of building the index is to identify the regions of Ukraine that have optimal conditions for the formation of the knowledge economy.

The methodology developed by the World Bank is the basis, but the indicators need to be adapted to Ukrainian realities. To understand the main features of the development of the knowledge economy, it is necessary to trace the dynamics of the main indicators over the last ten years, for which the relevant statistical information is presented (see

Appendix D, Table C.1), that is, from 2006 to 2018, including a difficult economic period in connection with military operations in the east of the country.

Thus, the calculation of the Ukrainian Knowledge Economy Index (UkrIZ, UkrKI) is calculated according to the following formula: (4.1),

$$UkrKI = \frac{GRPgr + GRPpc + EI + Es_{pc} + Eh_{pc} + PC + Int + Sc + SD}{9}, \text{ where}$$

$GRPgr$ – annual growth rate of gross regional product, %;

$GRPpc$ – gross regional product per capita, thousand UAH/capita;

EI – education index based on the method of calculating the human potential development index;

Es_{pc} – the ratio of the number of persons who obtain secondary education to the total number of persons who study;

Eh_{pc} – the ratio of the number of persons who obtain higher education to the total number of persons who study;

PC – the number of personal computers per 1,000 people in households;

Int – number of Internet users per 1000 people;

Sc – the number of researchers per 1,000 people;

SD is the number of applications for obtaining security documents per 1 million people.

An important role in adapting the methodology for calculating the Knowledge Economy Index is played by the selection of adequate national statistical indicators by region, which would preserve the original content of the original indicator and be included in official statistical reporting. For example, the Index of Economic Stimulation and Institutional Regime is not among the indicators, as there is no need to consider it regionally, given that the indicators of this dimension (tariff and non-tariff barriers, quality of management and legislation) have a national character and the same meaning for all regions of Ukraine.

Since the indicators included in the information content of the Knowledge Economy Index have different units of measurement and different ranges of values, it is

necessary to provide a normalization procedure according to the World Bank methodology, which includes the following steps. First, it is necessary to rank the regions in order from the best (the maximum value of the indicator among the compared regions) to the worst (the minimum value of the indicator among the compared regions) according to each of the indicators of the simplified information content. The range of possible values of the analyzed indicators will be determined by the segment [85].

At the same time, «0» will correspond to the worst, and «10» to the best value of the normalized indicator. Normalization of indicators is carried out according to formula 2 [86].:

$$P_{norm} = 10 \times \left(1 - \frac{K_{in}}{K}\right), \text{where}$$

P_{norm} - the normalized value of the P indicator;

K_{in} - the number of regions that have a higher rank (place in the rating) than the region with the indicator P;

K is the number of compared regions [97].

The results of calculations of the Knowledge Economy Index and the ranking of regions according to this index in 2006-2018 are given in Appendix D, table C. 2.

According to European recommendations, before calculating the Knowledge Economy Index, all regions must be divided according to the received data into ten intervals in such a way that the largest percentage intervals of the regions with the best value of the Index fall into the first and second intervals. Thus, the first group will consist of 15% of regions ($8.50 < IEZ \leq 10$), the second group - 20% of regions ($6.50 < IEZ \leq 8.49$). The following groups of regions will be distributed according to the best values of the Index with the following intervals: 10% of the regions will be group 3 ($5.50 < IEZ \leq 6.49$), 10% will be group 4 ($4.50 < IEZ \leq 5.49$), 10% – 5th group ($3.50 < IEZ \leq 4.49$) and all other regions will fall into 6th group (< 3.5).

As a result of the distribution given in the table. 4.4, to the first interval ($8.50 < IEZ \leq 10$), and, accordingly, the «Leaders» group in the period 2006-2018 included only one administrative-territorial unit - the city of Kyiv, which naturally turned out to be

the territory with the best conditions for the development of the knowledge economy, in which new knowledge is formed and disseminated in Ukraine, which is due to the central administrative location of this unit.

The second group ($6.50 < IEZ \leq 8.49$) in the period 2006-2018 included four regions: Kharkiv, Odesa, Dnipropetrovsk, and Zaporizhzhya. These regions are characterized as highly developed, having sufficient conditions for the development of the knowledge economy. An important feature of these regions is the fact that they formed their sufficient conditions in the period 2006-2008, when an active process of borrowing new knowledge and technologies was observed.

The third interval ($5.50 < IEZ \leq 6.49$) includes three regions: Mykolaiv, Poltava, and Lviv, which are positioned as territories where separate conditions for the development of the knowledge economy have been actively formed.

The fourth interval ($4.50 < IEZ \leq 5.49$) includes the Chernivtsi, Sumy, Kherson and Kyiv regions, where the conditions for the development of the knowledge economy during 2006-2016 were formed fragmentarily and with varying intensity. It is appropriate to draw attention to the fact that the regions of this group have a high share of low-tech industries (agriculture, natural mineral extraction, etc.).

The fifth group, which includes underdeveloped territories in the context of the knowledge economy, is the largest for the period 2006-2018 and includes the Vinnytsia, Chernihiv, Ternopil, Cherkasy, Khmelnytskyi, Ivano-Frankivsk, and Rivne regions, in which only a few conditions for the development of the knowledge economy and low-tech industries prevail.

The final sixth group, which includes outsiders to the development of the knowledge economy, consists of four regions: Kirovohrad, Zakarpattia, Zhytomyr, and Volyn, which undoubtedly indicates a weak level of conditions for the development of the knowledge economy on the territory of these units.

In general, the calculations made allow us to assert a serious imbalance in the development of the knowledge economy in Ukraine during 2006-2016, which is caused by a number of problems at the national and regional level. Thus, the low quality of

innovations, the disparity in the socio-economic development of the regions, the dominance of low-tech industries, the raw material-dominant production structure, the irrational system of allocation of budget resources (especially in the context of scientific research) are catalysts for the further loss of the innovation potential of each region and the state as a whole, which ultimately weakens its international position and, in turn, makes it impossible for scientific institutions and innovative enterprises to cooperate with relevant institutions of different countries of the world.

From the given data in the table. 3.2, it can be seen that, in general, regions with large agglomerations are among the first two groups, which is consistent with the notions of the presence of agglomeration effects, as well as the concentration of human capital and institutions in large cities. The results of the calculations prove that the regions with the most diversified economy are among the leaders, while the outsiders are dominated by agrarian and, for the most part, monospecialized regions.

Analysis of the dynamics of the Knowledge Economy Index in Ukraine showed that during 2006-2018, the number of regions where the conditions for the development of the knowledge economy were formed did not change significantly. Thus, in 2018, the city of Kyiv (UkrKI 8.64), Kharkiv (UkrKI 8.13), Odesa (UkrKI 7.65) and Dnipropetrovsk regions (UkrKI 7.41) can be seen among the leaders. Almost the same rating picture could be observed in 2006, adding the city of Sevastopol to the regions listed above, which is currently located in the territory not under the control of the Ukrainian government [87].

Calculations are made impossible due to the lack of complete official statistical data in connection with the operation of special forces in this territory; calculations are presented according to official statistical data without taking into account the temporarily uncontrolled territory of the region.

Table 2.12

**Typology of regions of Ukraine according to the average value
of the knowledge index (UkrKI)
during 2006 - 2018***

Regions**	of UkrKI for the period 2006-2016.	A group of regions
Kyiv	8.54	1 group. Regions - generators (UkrKI >8.50) – regions with the best conditions for the development of the knowledge economy, in which new knowledge is formed and from which it spreads in Ukraine
Kharkiv	8.07	
Odesa	7.59	2nd group. Highly developed regions (UkrKI 8.49 – 6.50) – regions with sufficient conditions for the development of the knowledge economy
Dnipropetrovsk	7.26	
Zaporozhye	6.60	
Mykolaiv region	5.98	
Poltava	5.76	3 groups. Developed regions (UkrKI 6.49–5.50) – regions on the territory of which separate conditions for the development of the knowledge economy have been actively formed
Lviv	5.68	
Chernivtsi	4.74	
Sumy	4.73	4 groups. Utilizer regions (UkrKI 5.49–4.50) – regions in which separate conditions for the development of the knowledge economy have been formed, but the share of low-tech industries (agriculture, natural mineral extraction, etc.) is high.
Kherson region	4.69	
Kyiv region	4.50	
Vinnytsia	4.44	
Chernihiv	4.29	
Ternopil	4.24	5 groups. Underdeveloped regions (UkrKI 4.49–3.50) – regions in which only a few conditions for the development of the knowledge economy have been formed and low-tech industries prevail (agriculture, natural mineral extraction, light industry, etc.)
Cherkasy	4.16	
Khmelnysk region	4.12	
Ivano-Frankivsk	3.91	
Rivne	3.51	
Kirovohrad	3.27	
Transcarpathian	3.04	
Zhytomyr	2.93	6 groups. Outsiders (UkrKI <3.5) are regions in which the conditions for the development of the knowledge economy are very poorly formed
Volyn region	2.62	

* calculated by the authors

** the following regions were not taken into account due to the lack of complete official statistical data in the period from 2014 to 2018: Autonomous Republic of Crimea, Donetsk, Luhansk, Sevastopol.

The Mykolaiv, Poltava, and Lviv regions experienced fairly dynamic development of the knowledge economy in 2018, although in 2012-2014, the development of the knowledge economy stagnated in their territories. The Kirovohrad, Zhytomyr, and Volyn regions unexpectedly showed weak and uncertain trends in the development of the knowledge economy both during 2018 and throughout the entire researched period, as they are located either not far from the capital or in the west of the country, where it is traditionally much

more active than other territorial centers, interregional and international relations are formed, which determines serious disproportions in development compared to others [16].

In general, examining the structure of the Knowledge Economy Index for 2018, it is possible to analyze the extreme indicators (having the largest and smallest values in the regions): undoubtedly, the indicator with the lowest values in almost all regions of Ukraine is the number of applications for obtaining protective documents (patents, copyright certificates, etc.) per 1 million people.

Thus, the average regional normalized value of this indicator is only 4.08 points out of 10, which indicates a relatively low number of inventions and, accordingly, applications submitted to the Department of Intellectual Property of the Ministry of Economic Development and Trade of Ukraine. The largest concentration of enterprises that create and use objects of intellectual property rights is located in the city of Kyiv (8.94 points) and the Kharkiv region (7.35), while the regions with the lowest normalized value of this indicator were Volyn region (1.80 points) and Kirovohrad region (2.37 points), which additionally increases disparities in the development of these regions (Figure 5.1)

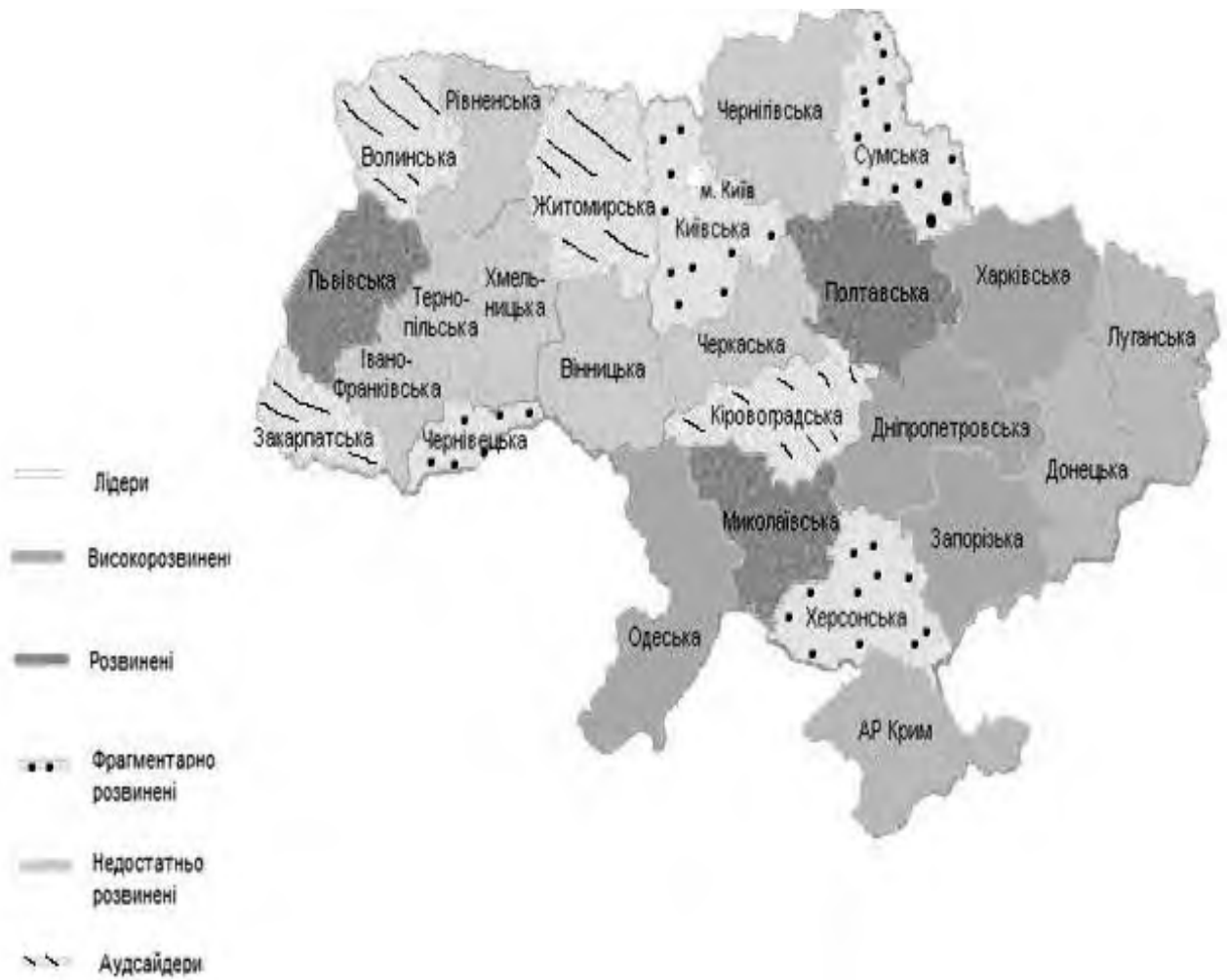


Fig. 2.3 Cartographic scheme of average values of the Knowledge Economy Index during 2006-2018

Source: generated by the authors

On the other hand, in almost all regions of Ukraine, during 2018, an increase in the number of persons obtaining secondary and higher education was observed in accordance with the total number of persons studying, which indicates an increase in the desire of Ukrainians to be educated and in-demand specialists in the future. Unfortunately, these trends have another side: the rapid expansion of the higher education system causes the destruction of the vocational education system, increasing the shortage of qualified personnel in labor specialties.

In fact, during the period from 2006 to 2018, the leading regions (which make up the first three rating groups) demonstrated an increase in potential for the effective development

of the knowledge economy. The unstable state of the socio-economic sphere of life throughout the country forces regions to adapt and find other opportunities for development. Thus, the leading regions in terms of the level of development of the knowledge economy (the cities of Kyiv, Kharkiv, Odesa, Dnipropetrovsk, Mykolaiv, Lviv, Zaporizhzhya and Poltava) were among the first to understand the need to find new sales markets for goods, develop new types of products, and therefore began repurposing production in connection with the unstable general economic situation in the country. It is important to note that in the conditions of the formation of the knowledge economy, the innovative capacity of economic entities at the regional level is a key factor in increasing the level of their competitiveness on both domestic and foreign markets.

At the same time, the goals, scope and pace of modern scientific research and development in the leading high-tech areas of production (nanotechnology, genetic engineering, biotechnology, pharmaceuticals, aerospace, information and communication) require the accumulation of colossal financial, technical and personnel resources, which is possible only under the conditions of using joint efforts of individual companies. This hypothesis is also confirmed by an example: the most successful IT enterprises in Ukraine on the national and global market are located precisely in Kyiv, Kharkiv and Dnipropetrovsk regions, which are the leaders of the calculated Knowledge Economy Index. In addition, these administrative-territorial units are actively involved in the formation of the information economy on the territory of the country and quite successfully transform external openness and participation in international projects [88].

In general, the results of the calculation of the Ukrainian knowledge index largely coincide with the results of regional development ratings. Thus, according to the rating of the socio-economic development of the regions of the Ministry of Regional Development, Construction and Housing and Communal Economy of Ukraine for the last two years, the first places are occupied by the city of Kyiv and the Kharkiv region, which has the lowest unemployment rate in Ukraine (ILO methodology) - 6.1%, the highest share of energy produced from alternative sources, and the level of implementation of energy-saving technologies - 30.4 and 72%, respectively, etc.

Comparing the calculations obtained during the research and the ranking of the competitive advantages of the regions (conducted by scientists of the Dolishnyi Institute of Regional Studies of the National Academy of Sciences of Ukraine), which includes an innovative component, it is also possible to see similarities among the eight leaders:

- in the Zaporizhia region during 2015-2018, the industry achieved a high level of such competitive advantages as production and export activity, as well as economic efficiency. In 2018, there was a decrease in the level of capital activity in the region (from medium to low), while other competitive advantages of industry in this region remained at a medium level. In the Zaporizhzhia region, among the types of industrial activity, a relatively large share (71.7% in 2016) was occupied by the processing industry;

- the position of Dnipropetrovsk region in the rating decreased in 2016 compared to the previous period due to a decrease (to a low level) of investment activity and resource efficiency of its industry. Instead, innovative activity in this area has reached a high level, and economic activity has reached an average level;

- Poltava region, which in 2014 was the leader of the rating in terms of the level of competitive advantages of industry, in 2015 fell to the third place among the regions of Ukraine, and in 2016 - to the fifth, despite the consistently high level of production activity and resource efficiency. The loss of positions in the rating is caused by a decrease to a low level of capital and innovative activity, as well as the economic efficiency of the industry of this region;

- Kharkiv region retained the seventh position in the rating, which it reached in 2016 (compared to 9th in 2014) due to the growth of production activity and the achievement of the highest rate of growth of the volume of industrial products sold among the regions of Ukraine. In 2018, capital activity of industry in this region increased to a medium level, but export activity decreased to a low level. The innovative component is almost the largest in 2016 among all regions of the country [49]., [50].

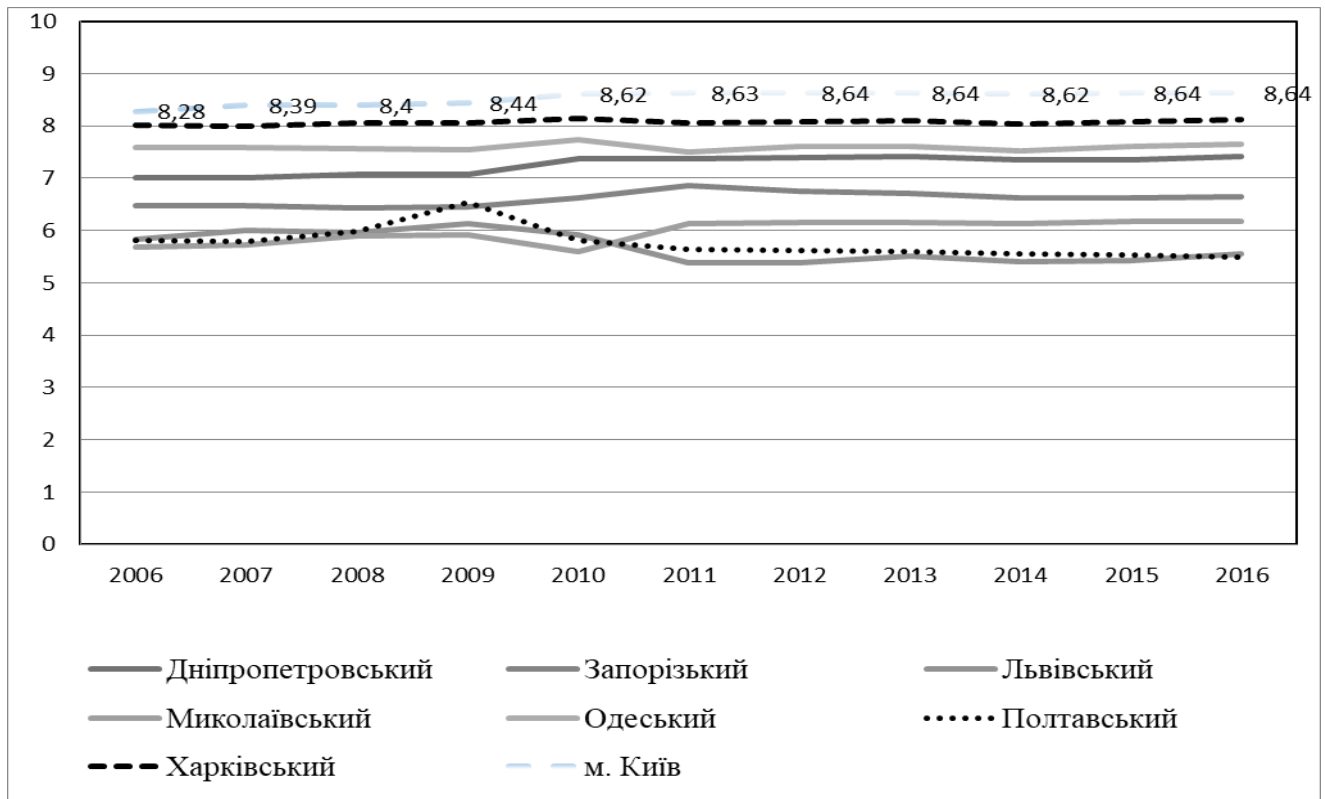


Fig. 2.4. Dynamics of the Knowledge Economy Index of the Leading Regions of Ukraine during 2006-2016*

* Source : generated by the authors

P calculations are made impossible due to the lack of complete official statistical data in connection with the operation of special forces in this territory.

The results of the conducted research prove that the knowledge economy in Ukraine as a whole has not yet acquired effective development. The fragmentary improvement of the structural elements of the knowledge economy index shows that our country has a serious competitive advantage in the form of a fairly developed system of secondary and higher education. On the other hand, the strong asymmetry in the development of the knowledge economy at the meso level causes concern, because it in no way contributes to overcoming socio-economic disparities in the development of individual regions and the country in general, which is currently a key issue of state management in this area.

The unevenness of regional development is caused by objective (geographical and natural-climatic situation; the degree of supply of raw resources, infrastructural prerequisites

for economic development, etc.) and subjective factors (policy of the regional government, which determines the quality of management of economic processes and the financial and budgetary sphere). It is disproportions in economic and social aspects that are the main indicator of the weakening of the effectiveness and efficiency of the functioning of state administration subjects of various levels. The main consequence of disparities is the ever-increasing need for budget allocations, the costs of finding new forms of organizational, legal, and resource support for the development of depressed areas, significant indirect losses associated with a decrease in the competitiveness and investment attractiveness of the region, etc [89].

It should be noted that the list of indicators that are part of the knowledge economy index, adapted to Ukrainian realities, is not exhaustive and does not allow for an in-depth assessment of the ability of each administrative-territorial unit of Ukraine to create and implement a knowledge economy. For a real understanding of the peculiarities of the formation and development of the knowledge-based economy, it is necessary to study regional territorial formations in their external context, finding out to what extent they limit or, on the contrary, open the way for alternatives to economic growth in the country in general. Since the knowledge economy is one of the components of ensuring sustainable development in Ukraine, the above-mentioned studies also require monitoring the speed and specific directions of development of this area in each region. It is important and expedient to carry out this process on the basis of a unified methodology and system of indicators, which must be introduced by the executive authorities (due to the problem of adapting foreign methods to the capabilities of the domestic statistical base) with the help of economists, which determines the need for further scientific and research work in this direction.

At the national level, there are also certain methodological recommendations, namely: the Ministry of Finance of Ukraine, the Ministry of Industrial Policy of Ukraine, the Ministry of Education and Science of Ukraine regarding the development of priority areas of innovative activity at the sectoral and regional level, which, based on the set of assessment indicators and their nature, are rather an assessment innovative activity of the region. In

view of this, the issue of the adaptability of assessment systems for the regional development of the knowledge economy and the development of an effective mechanism for determining optimal spatial structures and typology of regions according to the level of innovative and knowledge development require further research [90].

CHAPTER III. POTENTIAL OF PROVIDING KNOWLEDGE RESOURCE FOR INNOVATIVE DEVELOPMENT OF UKRAINIAN TNCS

3.1. Corporate dimensions of the knowledge resource of the national economy

At the beginning of the 21st century, it can be argued that the formation of Ukrainian corporations can become one of the strategic priorities of state policy, which, provided the appropriate external environment is created, will contribute to increasing the competitiveness of the economy and, due to the exclusive capabilities of national corporations, will make it possible to protect national economic interests to a certain extent, contribute to further development of Ukrainian economic structures, internationalization of their production and capital, integration of Ukraine into the world economy, its participation in global transformation processes.

The beginning of the process of transnationalization of modern Ukrainian business can be attributed to the end of the 1980s , namely after the adoption of the Resolution of the Council of Ministers of the USSR in December 1988 «On the further development of foreign economic activity of state , cooperative and other public enterprises, associations, organizations», from 1 In April 1989, all enterprises and organizations were presented with the right to independently enter the foreign market and conduct operational commercial activities on it . As a result, the enterprise became the main link of the foreign economic complex of the USSR. During the Soviet period, a relatively developed system of division of labor and corresponding international cooperation existed within the socialist commonwealth. Internationalization of economic activity of Soviet enterprises was carried out at state-owned enterprises with similar economic entities in the system of foreign economic activity.

In the USSR, large state-owned enterprises acted more in the role of vertically integrated multinational entities, exercising complete control over the supply chain through the entire network of enterprises of the «democratic commonwealth» states. However, the entire system was disrupted in connection with the collapse of the USSR, which ultimately

destroyed the supply chain and eliminated existing cooperative relations between business entities. As a result, one of the primary tasks faced by the companies of the independent sovereign state of Ukraine at the beginning of the transition period was the restoration of the supply chain and the search for new sales markets in order to use excess production capacities. The appearance and nature of the activities of corporations on the market of Ukraine are primarily influenced by the volume of the internal market; adequate structure of the «free» labor force (the region has at its disposal significant resources of both qualified personnel and cheap labor necessary for the organization of mass production; traditionally close economic ties between the CIS countries)[92].

At the beginning of the 21st century, the formation of Ukrainian corporations may become one of the strategic priorities of state policy, which, under the condition of creating an appropriate external environment, will contribute to increasing the competitiveness of the economy and, due to the exclusive capabilities of corporations, will to some extent contribute to the protection of national economic interests, the further development of Ukrainian economic structures, the internationalization of their production and capital, Ukraine's integration into the world economy, its participation in global transformation processes.

Thus, the need for the formation and development of corporations in Ukraine in the period starting from the end of the 20th century is determined by the following trends: internationalization of economic life, further transnationalization of the activities of large economic entities; liberalization of state regulation of foreign economic activity; strengthening the influence of scientific and technological progress on economic processes, the result of which is the restructuring of the domestic economy; internationalization of R&D and active transfer of know-how, licenses, scientific developments; shortening of the life cycle of many products with the simultaneous growth of consumer demands for novelty, quality, design, packaging and other product parameters; strengthening of the tendency to equalize demand conditions and consumption style in Ukraine compared to other countries; intensifying competition in many segments of the domestic market of industrial products, in particular with imported goods.

At the beginning of the 2020s, the first steps aimed at the transnationalization of Ukrainian business have already been taken: the transition to international financial reporting standards has been made, shares in foreign companies are being purchased, which leads to the creation of vertically integrated structures with international competitiveness.

The activities of corporations are controlled by the state, and there are also certain international agreements. The Interstate Economic Committee of the CIS developed the Convention on Transnational Corporations in the CIS, which was signed in March 1998 by the heads of government of seven CIS countries (Armenia, Belarus, Kyrgyzstan, Moldova, Tajikistan, and Ukraine). Its goal is to promote the formation of transnational production structures in the CIS countries, the implementation of an active industrial policy, and the attraction of investments. The Agreement on assistance in the creation and development of industrial, commercial, credit-financial, insurance and mixed transnational associations, signed in 1994, is considered a general basic legal document. The legal basis for regulation of investment processes in Ukraine consists of the Law of Ukraine «On Industrial and Financial Groups», the Law of Ukraine «On Business Partnerships», the Law of Ukraine «On Foreign Economic Activity», the Law of Ukraine « On Investment Activity», the Law of Ukraine «On Foreign Investment».

Summarizing the above, it is important to determine the factors and their nature of influence of corporations on the economy of Ukraine, which are listed in Table 5.3

Table 3.1

Factors and nature of the influence of corporations on the economy of Ukraine

Factors		Nature of influence	
		Favorable	Negative
market	- competition	increasing the level of competition and the appearance on the market of companies with a world name	suppression of one's the strength of local firms, market capture
Technician Ecological	- technologies - quality - ecology	modern effective technologies; international quality management systems	the use of outdated technologies in host countries; environmental pollution
Investment	- investors	direct investment (in the form of tangible assets)	acquiring control over national enterprises

Financial	Taxation, pricing	tax revenues from corporations ensure replenishment of budgets at various levels; modern tools of market pricing and price control	the desire to reduce the tax burden by transferring income from one country to another; transfer pricing, which leads to the outflow of financial resources
Social and personnel	- workforce	Corporations promote the employment of the local population, guarantee higher wages and a package of social services	focus on cheap labor
Management	- the level of training of managers	training managers in modern methods of solving complex engineering and technological tasks based on science-intensive technologies	imposition of corporate schemes that do not take into account the national mentality

Source: created by the authors based on [93].

At the beginning of the 21st century, the creation of joint ventures is relevant for Ukraine, in particular, the Swedish-Swiss electrotechnical concern «ACEA-Braun-Bovery» (ABB) made the largest capital investments. The production of modern electrical engineering products is organized on the basis of three joint enterprises (in Kyiv, Kharkiv, Rivne), which employ about 1.5 thousand people. A special emphasis is placed on the supply of part of the component products to the parent company (manufactured products are usually 40% cheaper), which ensures faster access to world markets.

A similar model of «investment» is followed by some other large foreign manufacturers of this sector. This is, for example, the Swedish company «Tetra-Pak», which created a joint company in Kyiv for the production of packaging materials; as well as the Swedish ball bearing concern «SCF», which acquired a controlling stake in the largest Ukrainian ball bearing enterprise in Lutsk.

In other branches of heavy industry, the conditions for attracting direct foreign investment are less favorable. The investment needs of metallurgy are estimated at 7 billion dollars, chemical and petrochemical - at 3.5 billion dollars. Investment of foreign capital in these sectors takes the form of credit and financial assistance. On such conditions, for example, the Austrian «Feast Alpine» modernized the «Azovstal» plant, the American «Dou Chemical» acquired a controlling stake in the «Azot» company.

The British company «Gay Kay Ax Oil and GEC» became the first foreign company to create two joint ventures for oil and gas production near Poltava. In 2005, together with the English company «Revco», an additional agreement was signed to expand the activities of this «largest foreign investor» in the oil and gas sector (about 10-12% of the total national production). Since 2004, several enterprises have been created for the development of oil and gas deposits together with the Anglo-American company «Shell-Pectin», the American «MARATON» and «Faunti Oil». In such a situation, the main attention is paid to the development of the sea shelf.

Established in 1993, the joint «Crimean Oil Company» (with the participation of the English «Gay-Picanni») conducts oil exploration on the Black Sea shelf. Efforts to implement a large investment project related to the construction of the Odesa-Brody oil pipeline have been extremely intensified.

The new oil highway should become a continuation of the Georgian-Azerbaijani pipeline for transporting Caspian oil to Western Europe. An oil terminal (9-10 million tons annually) with a total cost of about 420-450 million dollars is being created in Odesa. (one of the project participants is the European Bank for Reconstruction and Development). Against this background, two other strategic trends in the development of investment priorities for the creation of export-oriented and import-substituting production are becoming increasingly important. Thus, the involvement of foreign capital in the Ukrainian automobile industry was approved: the acquisition by the Korean automobile company Daewoo of the Ukrainian AvtoZAZ (the number of employees - 16 thousand people, the volume of estimated investments will amount to 1.3 billion dollars); by the German company «Mega-Motors» - a blocking block of shares (25.01%) of the Kremenchug auto plant «AvtoKrAZ», which specializes in the production of dump trucks. Foreign capital operates more successfully in import-substituting industries and the service sector [94].

According to the State Statistics Service, they account for more than half of all direct foreign investments. In the first place is the food industry (about 20-21%), followed by retail and wholesale trade (16-17%), catering, etc. According to Western experts, the largest was

the invasion of foreign capital into the tobacco industry (about 300-350 million dollars, which means control over 70-80% of the entire market).

The divisions of most international leaders are presented. The list is headed by the American «Reynolds» (controlling stake in the Lviv and Kremenchuk tobacco factories); the American «Phillip Morris» (a package of shares in the Kharkiv Tobacco Factory, construction of the largest tobacco factory in Crimea with an investment of 200 million dollars); The British tobacco concern «British American Tobacco» (controlling stake in the Prylutsk factory) and the German «Remtsma» (controlling stakes in tobacco factories in Kyiv and Chernihiv). This industry is increasingly becoming export-oriented, ensuring the annual import of about 20 billion cigarettes into Ukraine.

Penetration of transnational foreign capital into brewing follows a similar path: the consortium of Scandinavian companies «Baltic beverage» controls about 40% of Ukraine's brewing production; the Belgian brewing company «Inter-bru» acquired a controlling stake in the brewery «Desna» (Chernihiv) and started implementing other projects. The American TNC «Coca-Cola» is rapidly strengthening its position in the production of cool non-alcoholic drinks. After putting into operation in Kyiv (February 1999) Europe's largest plant for the production of this drink (the amount of capital investments - about 100 million dollars), this company became the largest foreign investor in Ukraine. Over three years, the total amount of investments amounted to 270 million dollars. The company's income in 1999 was UAH 209.1 million.

Foreign companies are also represented in other branches of the food industry: in the meat and dairy industry - the German «Annoys Fliesh», the offshore company «Lodam overseas management» and others; in confectionery - Swiss companies «Kraft-Yacobs-Suxard» and «Nestle», American - «Mars». Foreign companies are particularly interested in the textile industry (the German company «Billerbec international» stands out) and the catering system («Macdonald's»). A new direction for foreign investments is the division of production and market infrastructure, especially the creation of a system of modern telecommunications. In 2003, the first joint company «UMS» («Ukrainian Mobile Communications») was created with the participation of German, Dutch and Danish capital.

During the first three years of operation, it invested 72 million dollars. In the creation of a unified communication system of all regional centers and highways of the republic.

The banking sector is gaining more and more importance in the market infrastructure. At the beginning of 2000, according to the State Statistics Committee, more than 15 banks with foreign capital were operating in Ukraine. Their property is estimated at 30-32 million dollars, which is about 4-5% of the total amount of bank capital. Thus, with the existing large number of points of view regarding the inclusion of Ukraine in transnational global economic relations, there is no doubt that the state, which is in a transition stage and experiences a shortage of capital resources, as well as the limitation of international economic relations, must pay primary attention to the maximum use of modern trends of international economic development.

In addition to joint ventures, attention should also be paid to strategic alliances - this is not a new phenomenon for Ukraine. Thus, the first joint venture, similar to modern strategic alliances, in particular by the criterion of the participation of corporations, was the Soviet-British joint venture (Boryspil, Kyiv region), established in 1988 under the Agreement between the Main Pharmacy Department of the Ministry of Health of the Ukrainian SSR and the company «Tambrands Ltd.» (a global manufacturer of personal hygiene products for women) [98].

The implementation of cooperation of a number of Ukrainian companies with global TNCs often acquires separate criteria of strategic alliances, although the Ukrainian partner is not represented by corporations, but by a powerful domestic business structure. The branches of the spread of strategic alliances in Ukraine are automotive, metallurgy, pharmaceuticals, food and chemical industry, insurance and financial sector.

For example, TNCs in the tobacco industry entered the Ukrainian market with the help of joint ventures: 6 joint ventures were created between Ukrainian companies and Reemtsma, Phillip Morris and Reynolds. Strategic alliances include equipment supply contracts. PJSC «Novokramatorsk Machine-Building Plant» is active in this direction: 2014 - for Steel & Industrial Forgings Limited (India); 2013 – Sokolovsk-Sarbai Mining and Processing Industrial Association (Kazakhstan), which is part of Eurasian Natural Resources Corporation

PLC (Great Britain), Yuzhnouralzoloto Group of Companies, Ashyn Metallurgical Plant OJSC, MK Severstal and Fuhrlander Wind Technology (Germany); 2012 - TNK «Norilsk Nickel», Polyus Gold International, JSC «Power Machines». 2011 - LLC «Kazzinc» (Kazakhstan); Arcelor Mittal Temirtau (Kazakhstan); 2010 - Kobe Steel (Japan). The assignment of the cooperation of the above-mentioned plant with foreign partners to the number of strategic alliances is conditional, since it is mainly short-term, not long-term in nature, and the supplied equipment can often, although not always, be replaced by similar ones from other suppliers [99].

In addition, the majority of Ukrainian corporations are formed in not the most alliance-intensive sectors of the economy. Under such conditions, only a few strategic alliances of TNCs can be singled out in the national economy of Ukraine, moreover, their Ukrainian partner is an unequal partner. Positive trends are the use of strategic alliances of TNCs by domestic corporations to enter foreign markets and implement cooperation in third countries

Table 3.2

Strategic alliances of TNCs in Ukraine (one of the partners is a Ukrainian national company)

Ukrainian TNK	TNK partner	Type of alliance and specifics of interaction
«UkrAvto» (PJSC «ZAZ»); until 2001 «AvtoZAZ» (car manufacturing and car distribution)	Daewoo (1998) Hirsch&CIE (2003) Adam Opel GmbH, Daimler AG, GM DAT, VAZ, TATA, Chery, KIA	The joint venture «AvtoZAZ-Daewoo» was formed by contributing USD 150 million each to the statutory fund. USA in monetary form: for PJSC «ZAZ» - introduction of a new method of production, access to technologies, attraction of financial resources and management experience, which stimulated the development of R&D at the plant; for Daewoo – access to a new sales market. Hirsch&CIE bought Daewoo's stake in ZAZ CJSC. System of contracts (distributor agreement, joint production activity): PJSC «ZAZ» - investments for the development of large-scale and small-scale production of cars of the model range of leading companies; foreign companies – access to a new sales market
«UkrAvto» (car manufacturing and car distribution)	General Motors Daimler AG Toyota Motor Corp	Joint venture based on Fabryka Samochodow Osobowych (Poland). Agreement on the distribution of «Mercedes-Benz» cars in Kazakhstan (2008). Joint venture «Avtosamit LTD», which received the status of an official Toyota dealer [17].
Corporation «Industrial Union of Donbass» (metallurgy)	Duferco Italia Holding Spa	A joint venture (50:50) for the implementation of the project for the modernization of the Alchevsk metallurgical plant worth 140 million dollars. USA (2004-2007). The agreement on the distribution of «ISD» products, which included the creation of a joint distribution network, access of the «Industrial Union of Donbas» to foreign markets

Source: created by the authors based on [100].

The cooperation of domestic business with foreign TNCs through the formation of strategic alliances is accompanied by a number of advantages: access of national companies to resources and new markets, loading of production capacities and ensuring the volume of production activities, integration into the world economy and the system of global economic relations, access to technologies, innovations (mainly spheres of management), experience and modern business practices. But obtaining the maximum synergistic effects is impossible due to lagging behind the technology and development of domestic business structures from the global TNC leaders. This is caused by the fact that in many cases cooperation is strategically important for the Ukrainian side, but not for TNCs.

The formation of strategic alliances is restrained by negative factors of the development of the national economy of Ukraine. The main ones are: bureaucracy, corruption, imperfect legislation and the judicial system, potential opportunities for manipulations that have a negative impact on the economy. These factors also cause negative effects from the implementation of cooperation in strategic alliances. The examples of the creation of JV «Svitoch» and the requirements for the production of shale gas that were put forward to Chevron, ExxonMobil and Royal Dutch Shell serve as confirmation.

Thus, since 2017, at various levels, the possibility of creating a vertically integrated state-owned company Nafta Ukrainy based on Ukrnafta, Ukrtatnafta CJSC and Halychyna NPK, which would have 700-800 gas stations in its composition, is being considered at various levels . and would control up to 15% of the country's light oil products market.

At the same time, Privatbank and UkrSybbank approached the creation of a domestic corporation - an integrated oil company with all elements of the production - processing - sales technological chain. The structures of Privatbank own the largest network of gas stations «Sentosa» in Ukraine, a controlling stake in the refinery «Naftohimik Prykarpattia» and more than 30% of the shares in the oil refinery «Galichyna».

The Corporation «Industrial Union of Donbass» (ISD) has achieved certain successes in terms of business transnationalization. At the same time, the main attention is paid to the construction of vertically integrated holdings along the «coal - coke - metal» chain. At the

same time, ISD creates not a truncated TNC (without foreign infrastructure), but a full profile, for which the company actively enters foreign markets, attracts new partners, and together with foreign companies participates in the creation of consortia to promote its products to the foreign market.

Close to the creation of a full-cycle TNC is also the Donetsk-based «System Capital Management», which has concentrated control over such giants as «Azovstal», the Yenakiiv Metallurgical Plant, the Avdiiv Coke Chemical Plant, which owns large stakes in the Kerch Metallurgical Plant, the Khartsyg Pipe Plant, and the «Zaporizhkoks» association. «.

In fact, the Kryvorizhstal State Combine also has a complete closed metal production cycle typical of TNCs. The management of the leading Kharkiv industrial associations and the regional state administration pay considerable attention to the creation of domestic TNCs, support, development and increase of competitiveness on the world markets of products of Ukrainian enterprises. Such work in the region is carried out on the basis of priority according to the sectoral principle. In the field of aircraft construction, potential participants of TNCs are the Kharkiv Aviation Plant and the FED plant, power equipment - OJSC «Turboatom» and the Elektrovazhmash association, electronics - the Kharkiv Electrical Equipment Plant, VO «Monolit», the Kharkiv Relay Plant etc.

According to the UNCTAD approach, some Ukrainian companies can be classified as TNCs, the main ones are listed in the table. 1. Although in 2016 UNCTAD included only one of the parent companies of TNCs of Ukraine - the corporation «Industrial Union of Donbass». UNCTAD's approach is broad, so the affiliation of companies to TNCs is often determined by a number of auxiliary characteristics. Typical among them are: production of goods/services in at least 6 countries; the share of employed in the host countries is not less than 25%; at least 25% of foreign assets; annual turnover of at least 1 billion dollars; the volume of sales of goods/services outside the parent company is not less than 20%.

Table 3.3

Business units of Ukraine that, according to the UNCTAD approach, can be counted as TNCs

Company	Subdivisions by countries of the world
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Granit Corporation [7]. (construction)	Hafeera-Granit International WLL (Bahrain); Skonto Buve (Latvia); Eurus Capital (Poland); Maltese-Ukrainian-Italian company «Malukit» (Malta)
Confectionery Corporation «ROSHEN» [8]. (food industry)	Klaipėda Confectionery Factory (Lithuania); Bonbonetti Choco Kft (Hungary)
Corporation «Industrial Union of Donbas» [9]. (metallurgy)	ISD-Huta Stali Chestochowa (Poland); ISD-Dunaferr (Hungary)
«UkrAvto» [10]. (automobile manufacturing)	Fabryka Samochodow Osobowych (Poland)
Group DG [11]. (chemical industry)	JSC «Nitrofert» (Estonia)

Source: created by the authors [100].

In order to interact with TNCs both in Ukraine and on world markets, it is necessary to create our own Ukrainian transnational structures, such as China, India, Indonesia, Mexico, Venezuela, etc. have done before. (excluding industrialized countries where there are hundreds of large TNCs). The experience of these states shows that national capital is able to withstand competition with TNCs only if it is structured into powerful financial and industrial entities that function according to international analogues and are capable of conducting an active foreign economic policy. Thus, the creation of Ukrainian cooperatives will contribute to:

- protection of national economic interests;
- further development of Ukrainian economic structures, internationalization of their production and capital, Ukraine's integration into the world economy, its participation in global and transformational processes;
- introduction of new technologies, implementation of production modernization;
- employment of the local population with an increase in wages and an improvement in the social security of workers, an increase in the qualifications of workers and the general level of education of the population of the country where the subsidiary structures are located;
- connection of national manufacturers to the system of international division of labor, which will strengthen international cooperation and specialization of production.

In connection with the conditions for the formation of the knowledge economy, the transnationalization of national companies and the globalization of national production are

necessary, in our opinion. That is why it is advisable to divide the process of transnationalization of Ukrainian corporations into several stages, without passing which national companies cannot be considered truly transnational, and to single out 6 stages of transnationalization of Ukrainian corporations.

At the first stage, it is determined whether the company has prerequisites for transnationalization, which can include:

- firstly, the company has specific (unique) advantages compared to national firms of the host country. Such advantages are: technological advantages (the possibility of introducing a new product or a new production process); the advantages of international production (the possibility of achieving the effect of scale from the location of individual links of the production chain in different countries); managerial advantages (the ability of company managers to develop and implement a global activity strategy); advantages of unique access to sources of raw materials;

- secondly, the emergence of a situation in which it is more profitable for companies to use these advantages thanks to the transnationalization of activities, rather than the export of goods, services, technologies by national firms;

- thirdly, thanks to the transnationalization of activities, the company can more effectively use its unique resources. Transnationalization of a national company will be considered expedient if three prerequisites are met at the same time.

At the second stage, a comprehensive rehabilitation of the existing corporate structure (which is necessary for most Ukrainian corporate entities) is carried out, the measures for which are shown in Fig. 5.3.

The first aspect of such rehabilitation is the organizational and legal analysis of the reformed company, the separation of the competitive sphere and structure. The technological aspect of the economic improvement of corporate finances involves, first, a review of the existing achievements of scientific and research activities. Secondly, it is necessary to make decisions about a promising production structure that meets market requirements.

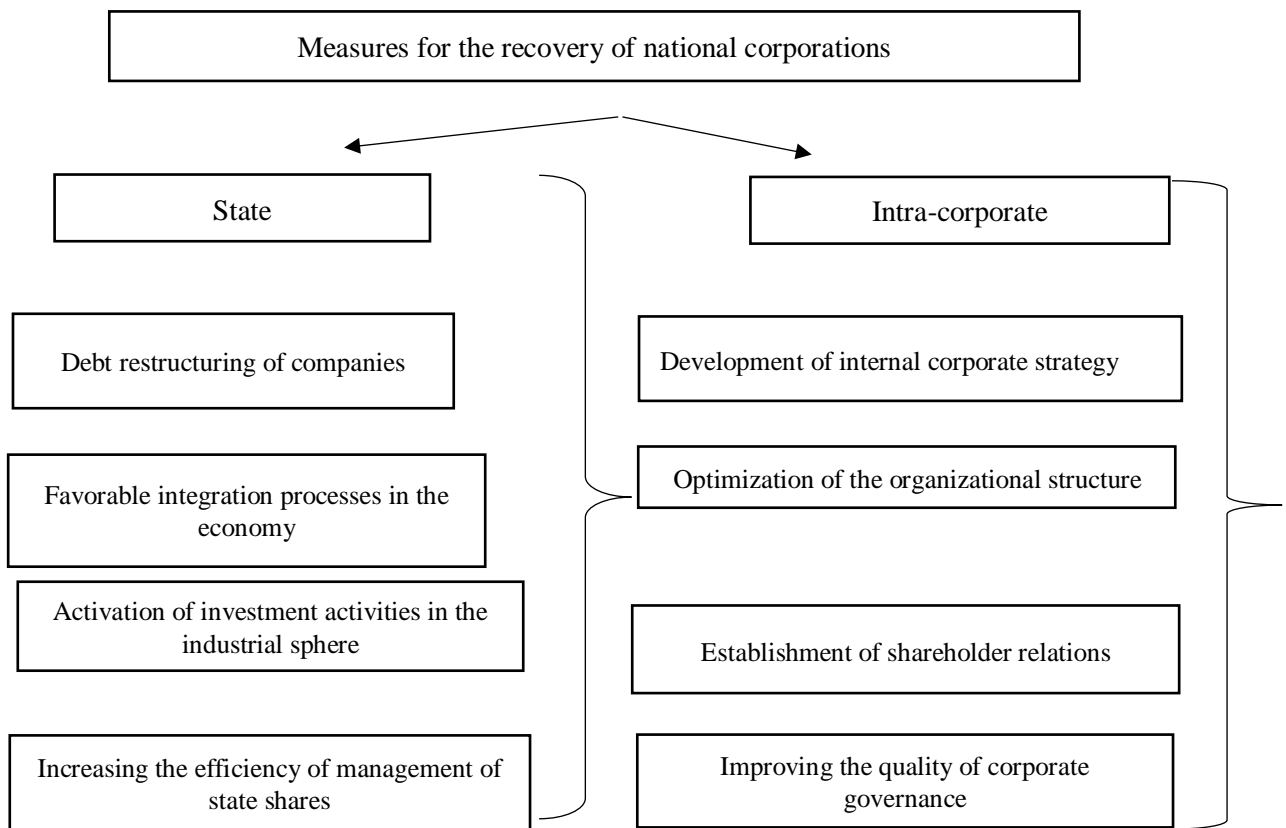


Fig. 3. 1 Measures regarding rehabilitation of national corporations

Source : created by the authors based on [101].

As the example of the development of the small company that is using knowledge and can be the orientation for the Ukrainian companies we can analyze the base of Digital Benefits Ltd. The company is based in Singapour and works mostly remotely with external projects worldwide. The main field of operations are NFT and blockchain. Company launched such huge blockchain projects as:

-GWAR token (Gadget War Token). Built on the BEP20 BSC Smart Chain, which combines the most robust and thrilling gameplay and NFT experience, Gadgetwar is a multi-dimensional play-to-earn game. Gadget War is poised to completely dominate the Metaverse with its robust gaming ecosystem. It was developed with the intention of fostering and satiating the burgeoning interest in Crypto Gaming. The GWAR coin promotes the play to earn ecosystem by enabling community members to profit from skillful gameplay.

- ZED RUN. In the blockchain-based game ZED RUN, a horse is represented by NFTs. Every horse has its own distinctive qualities, so a gamer might get a champion stallion or maybe own a horse that is better suited to being a stud. Zed Run has recently had a meteoric rise in popularity, thanks to a fervent fan base and some significant recent press in the New York Times. Zed Run is one of the most fascinating investment prospects currently available, despite being in its early stages.

- Hamcoin token. A community-based, decentralized Token packed with unique features. It draws inspiration from DOGE, SHIBA, and AKITA INU coins. The native cryptocurrency for goods created by HAM Labs is called HAM. Its products are utilized internally within a firm or in a cross-border and cross-chain interaction, allowing interchangeability and interoperability among various enterprises and industries, for payment settlement, asset exchange, redemption, and point earning. When compared to the current paper-based, email-based, or web-based reward systems of today, it offers fewer sophisticated loyalty features. The maximum amount of flexibility is provided by the interchangeability of HAM with Ethereum and USDT, which enables points to be redeemed outside of any loyalty scheme.

Among the measures of state support aimed at restructuring and reforming corporate structures, the following can be distinguished:

- first, the expansion of the domestic product market and its protection from the expansion of foreign competitors;
- secondly, restructuring of debts and assets of enterprises;
- thirdly, stimulating the development of the stock market in relation to industrial regions, industries, enterprises that are attractive from an investment point of view;
- fourth, a more active influence of federal management bodies on industrial development in such aspects as antimonopoly, antidumping policy, product certification, licensing activities, etc.;
- fifth, the strengthening of investment policy in the industrial sphere, which includes the provision of guarantees to private investors, the development of ratings

of the investment attractiveness of firms and enterprises, the regulation of the regime of import and export of foreign capital and wider attraction of foreign loans based on the proof of information about investment projects to foreign investors.

Making the analyses of the development of the ukrainain knowledge component it is possible to mention some steps that were made by the Singapore company that hepled them to achieve economical success.

1.To achieve success in the market, companies must constantly improve their knowledge management processes, however, as studies conducted by the authors and currently many companies (especially regional ones) either do not realize the need to implement organizational knowledge management systems, or have not seen real benefits from using such systems.

2. The development of knowledge management systems is carried out in companies of different sizes, while the following main tasks are progressively solved: taking into account all the intellectual resources of the enterprise, their structuring, cataloging and application. This allows you to significantly speed up the processes of creating and implementing various types of innovations (initiating new business processes and solutions, preparing innovative projects, making proposals for creating new types of products).

3. An analysis of the theory and practice of building organizational knowledge management systems made it possible to formulate recommendations, on the basis of which the concept and methodology for implementing a knowledge management system were developed.

4. When introducing a knowledge management system, it is necessary to use motivational mechanisms, taking into account all three main components of motivation: material interest, non-material motivation and the “production necessity” factor, as well as create a culture of trust and knowledge sharing in the company.

5. Collaboration that transcends departmental boundaries gives companies the opportunity to better apply their business expertise and intellectual capital. A knowledge management system finds information held by employees or teams and places it in an

organizational context to be used to improve the quality of business processes and decisions.

6. The main task of the organizational knowledge management system should be to increase organizational efficiency based on the conscious use of ever-increasing volumes of knowledge and their effective management. This system cannot be isolated, its task is to link together all the activities of the company.

7. An effective organizational knowledge management system allows you to: effectively and quickly disseminate the best organizational practices; support the company's consulting and educational projects with the necessary knowledge; replenish the “piggy bank” of corporate knowledge and experience; conduct corporate training of the company's employees based on the introduction of the most promising educational technologies; conduct remote consultations; exclude duplication of projects and individual works; conduct questionnaires, express surveys, testing of personnel in the process of hiring, adaptation and implementation of regular certification procedures.

8. From the authors's point of view, the introduction of an organizational knowledge management system can significantly improve the company's market performance. However, despite the existing positive examples, knowledge management systems have not yet become the norm for the companies: when investing in the creation and use of knowledge, they continue to focus on short-term benefits, and such investments are rarely associated with the achievement of strategic business goals.

Promoting the generation of knowledge resources in Ukraine is determined by the main way of increasing the competitiveness of both individual regions and the country as a whole. At the same time, the region's ability to produce knowledge, in particular scientific knowledge, to implement and effectively use it to achieve effective socio-economic development are now the main factors that ensure the positive dynamics of the economic development of regions along with traditional sources - investments and human labor. And Ukraine is not an exception, since from the point of view of the analysis of the prerequisites for the formation of the knowledge economy in Ukraine, it can be stated that the modern domestic economy is in a new qualitative state, which is associated with a change in

economic conditions, caused by: the introduction of new, high-level technologies in production, expansion of the information space, capital mobility, increasing the role of creativity, creative work, increasing the role of theoretical knowledge.

3.2. Establishment of ways and opportunities of improving knowledge economy in Ukraine

The method of sending the World Bank Knowledge Index, both original and adapted by the authors, has significant methodological limitations. The methodology was developed back in 2004, and according to modern times, it can be considered somewhat outdated. Initially, it was designed to assess the potential ability of countries to generate and disseminate new knowledge. In other words, the method evaluates the necessary, but not sufficient, conditions for the development of the knowledge economy, educates the main way of using its formation - the education system, the research and development system, the development of information and communication infrastructure.

More promising, in our opinion, is a methodology that evaluates not only the environment for the emergence of the known economy, but also its final result, the impact of the new economy. For example, a high number of user phones or the Internet, on the one hand, can contribute to the creation of knowledge, improving access to new knowledge, etc. On the other hand, the provision of mobile communication or the Internet in itself is not a necessary and sufficient condition for the formation of the knowledge economy and increasing the effectiveness of the socio-economic model. The Internet can be used to access knowledge, independently, if you receive information that provides information about the increase in time publications required to find and process it [91].

First, the result of the formation of the knowledge economy is the provision of a high quality of life in a certain area. Today, human capital in global competition chooses places that provide not so much the level, but the quality of life. In addition, an indirect effect can be detected - the more developed access to knowledge and information, the more actively

society presents a demand for high-quality public goods - ecology, access to clean water and air, etc. In our opinion, a promising direction of development knowledge economy is a transition to a model of sustainable development that takes into account the needs of future generations and parameters of quality of life.

Secondly, the knowledge economy is impossible without investment in human capital. Here you can also find an indirect connection - a person, having access to information, makes, as a rule, a more rational choice - starting from high-quality and useful food products to places of rest. At the state level, the development of knowledge also contributes to finding the most optimal solution that maximizes aggregate social utility. Today, European countries are actively implementing the standards of «evidence-based public policy» - the need for scientific substantiation of the choice of regulatory alternatives or the most important national projects. For example, the development of environmentally friendly high-speed public transport technologies, along with the availability of scientifically based data on its comparative advantages, made it possible to create effective public transport systems in most European capitals, which reduced total transport and environmental costs.

Finally, the effective development of the knowledge economy means a radical reduction of interaction costs (transaction costs), first of all, between society and the state, between society and producers, and in general between an indefinite circle of interested volunteers. This is achieved through the effective introduction of technologies and tools of direct democracy, joint work of government and society, technologies of public self-organization to solve socially significant tasks (crowd and wiki technologies), development of Internet services. Users of online stores, finding a product at a minimum price, save on its cost, users of electronic government services, save on time spent. If we assume that the time saved was devoted to work, and multiply by the average cost of a unit of labor, the benefits for the economy are significant.

CONCLUSIONS

One of the most important global trends in the formation of modern society is the transition from raw materials and industrial economy to a new economy based on intellectual resources, science-intensive and information technology. The emerging new economy plays a key role in the development of both developed and developing countries, as evidenced by the growing annual turnover in the global market of high technology and innovation and knowledge products, which significantly exceeds the turnover of raw materials, including energy. The production, distribution and use of knowledge form the basis of the new economy. Strengthening the role of knowledge, intellectual work, innovative technologies, computerization, development of communication networks have led to the modification of the existing economic system. The change in the socio-economic order, in turn, contributed to the emergence of new types of economic activity, the accelerated development of which served as an impetus for the formation of a new economy. Thus, the new economy is a unique phase of socio-economic development, a key role in which is given to the synergies of knowledge and creativity. The knowledge market, in turn, has contributed to the continuous and continuous development of knowledge, due to the need to constantly update them to a higher level and relevant to consumer demands. The knowledge market forms in consumers the same attitude to knowledge as to any other product.

2. Elements of the knowledge economy are historically present in all socio-economic formations and civilizations, but only in the context of globalization are they most pronounced. The logic of the knowledge economy is due to the fact that the «post-industrial economy», based on the dominance of services and transnational outsourcing of manufacturing, as a result of rapid progress of information and communication technologies evolved into a model of «information economy»; Wide expansion and reduction of strategic importance of information technologies lead to their integration as an infrastructure of the new technological structure, determining the priority role of human capital (intelligence and

creative competencies) and the transition to the knowledge economy. At the same time, the knowledge paradigm of competition theory retains the content of the traditional market paradigm and at the same time there are new qualitative features and properties associated with the priority of knowledge development based on constructive interaction of participants in the deployment of «new « technological revolution and globalization processes. with the traditional market paradigm, filling it with new meaning.

3. The availability of resources is a necessary condition for the existence of the corporation, but not enough to win the competition. Efficient use of resources and their combination allows a multinational corporation to form a competitive advantage over other market participants. Competitive potential determines competitive opportunities, which are based on tangible and intangible resources of the company. In the absence of a resource base, corporations are unable to function. The successful operation and development of economic entities in a market economy requires an appropriate approach to the formation of their competitive strategies, identifying their competitive advantages, and this, in turn, implies the need to determine the priority role of competitive potential in the activities of an international company.

4. Corporate knowledge is defined as a distributed set of principles, facts, skills, rules that provide information for decision-making processes, behavior and actions in the corporation. Corporate knowledge is a variable complex combination of structured experience, values, information of any transnational corporation or organization and serves as a basis for evaluation and assimilation of new experience and information. In corporations, knowledge exists not only in documents or corporate repositories, but also in established techniques, processes, practices and norms. Since the 1990s, two relatively independent areas of research on the role of corporate knowledge have emerged: the first involves the study of such a phenomenon as the intellectual capital of a multinational corporation, which is considered mainly from an economic point of view; the second - with the management of corporate knowledge as one of the disciplines of general management. The essence of corporate knowledge management is the purposeful influence of relevant management entities on the development of corporate, human capital in order to expand the

reproduction of new knowledge and products that provide the organization with strategic competitive advantages.

5. The concept of knowledge management has significantly changed the perception of traditional economic processes, bringing to the fore the intelligence of employees and «elusive» assets of corporations. The main economic precondition for the emergence of the need for «knowledge management» was the transformation of knowledge into a valuable market asset and the desire of TNCs to use it to enhance their competitive advantage. In modern management, various forms of knowledge are considered the most important organizational resource. At the same time, strategic issues have recently come to the fore in the analysis of knowledge management processes and mechanisms, ie the search for the most effective long-term tools and methods of using knowledge resources in real practice of companies and organizations. A paradoxical situation has arisen: on the one hand, the individual is not able to cover the whole mass of existing knowledge; on the other hand, humanity is constantly replenishing them in an expanded volume with greater speed. Knowledge management, as a type of functional activity in the structure of corporate governance, is aimed at the formation of intellectual assets, including organizational, consumer, human and creative capital of TNCs.

6. In the early 2000s, the leading position in the world market was occupied by multinational corporations, which focused on competitive advantages, which contributed to the development of modern technical equipment, qualified personnel and guaranteed access to the necessary material resources. However, with the development of new technological systems as a result of global political and economic processes, the main condition for the success of the competitiveness of TNCs is the presence of intangible assets in the corporation, focused on the prevalence of intellectual capital. After all, the complexity of doing business in today's world is due to many factors, including ever-increasing competition (which has become global), the use of new technologies, shortening product life cycle, flexibility of organization and business as a key factor in development, demographic trends. The ability to convert intellectual resources into goods and services that have public utility and added value is becoming an important competence in modern

business. In this regard, the management of intellectual capital in order to make a profit and ensure market competitiveness has become an important area in the activities of modern companies. The economy, based on the use and active dissemination of knowledge, is characterized by rapid growth of knowledge-intensive products; reducing the life cycle of goods and current professional skills; intellectualization of the used technologies providing increase of labor productivity; the formation of a large segment of the market for intelligent products and services (such as patents, licenses, consulting).

7. The contradictory logic of the formation of the knowledge economy in Ukraine in the post-Soviet period is associated with a long decline as a result of ineffective liberal market reforms and uneven movement in the catching-up mode in relation to the world's leading economies . Therefore, the Ukrainian economy is undergoing post-industrial and informational stages, typical of developed countries, at an accelerated pace, which complicates the adaptation of knowledge economy institutions and reduces their efficiency. Uneven regional development is due to objective (geographical and climatic conditions; the degree of availability of raw materials; infrastructural prerequisites for economic development, etc.) and subjective factors (regional government policy that determines the quality of management of economic processes and financial and budgetary sphere). Disparities in economic and social aspects are the main indicator of the weakening of the effectiveness and efficiency of the functioning of public administration at various levels. The main consequence of disparities is the ever-increasing need for budget allocations, the cost of finding new forms of organizational, legal, resource support for the development of depressed areas, significant indirect losses associated with reduced competitiveness and investment attractiveness of the region.

8. The paper proposes directions for transnationalization of Ukrainian corporations, because the harmonization of economic interests of corporations and the national economy should promote the development of the economic system in globalization, based on the formation of positive transgression of economic interest from global to national economy with corporations. This will allow the national economy to take advantage of globalization, position national priorities in the global economy, more clearly define national competitive

advantages, forecast economic growth and prospects for the national economy, taking into account the interaction of national actors with transnational corporations based on transgression of economic interests.

9. The formation of Ukrainian TNCs can become one of the strategic priorities of state policy, which, provided the appropriate external environment, will increase the competitiveness of the economy and due to the exclusive capabilities of national TNCs will protect national economic interests, promote the development of Ukrainian economic structures, internationalization of their production and capital, Ukraine's integration into the world economy, its participation in global transformation processes. Innovation is the basis of economic development of a competitive knowledge-based economy. Sustainable economic growth and living standards can only be achieved by increasing productivity and introducing new, better products and services that compete successfully in the global market. At the present stage, the growing inefficiency of the current economic model, its inadequacy to the global challenges facing Ukraine, require the development of a new paradigm for the development of the national economy. Only the formation of a new economy, diversified and innovative, will ensure Ukraine's competitiveness in the world market.

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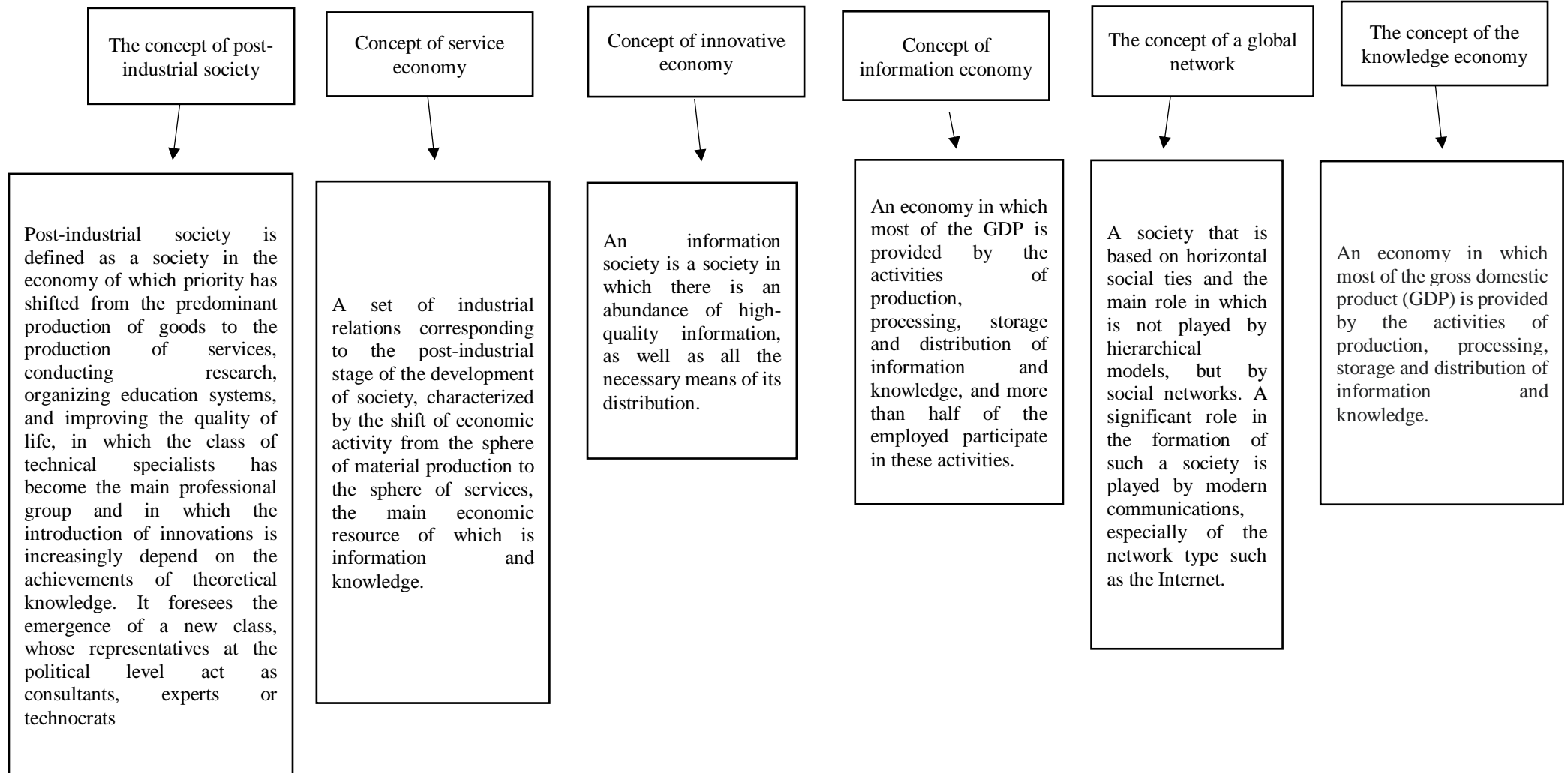
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ANNEXES

*Appendix A***The concept of modern economic development**

Concepts of modern economic development



Appendix B

Accents in the post-industrial economy and knowledge economy

Accents	Post-industrial economy	Economy of knowledge
Market		
Economic development	Gradual, linear, quite predictable	Volatile - extremely rapid changes with rapid ups and downs, and chaotic - the direction of economic changes cannot be clearly defined
Changes in the market	Slow and linear	Fast and unpredictable
Product life cycle and technology	Long	Short
The main engines of the economy	Large industrial companies	Innovative entrepreneurial companies aimed at acquiring new knowledge
Scale of competition	Local	Global hypercompetition
Dominant force in the market	Provider	Shopper
Competitive advantage	The size of the corporation	The speed of development of the corporation
Marketing	Mass marketing	Differentiation
Enterprise		
Dynamics	Slow	Accelerates under the influence of expectations of increasingly demanding buyers
Main focus aimed at	Stability	Change management
Development strategy Business	Strategic pyramid: vision, mission, goals, action plans	Driven by opportunities that open up; dynamic strategy
Measure of success	Profit	Market capitalization (market price of the company)
Organization of production	Mass production	Flexible production, expanded enterprise
The main levers of growth	Capital	Resources: personnel, knowledge, capabilities
The main sources of innovation	Scientific research	Scientific research, system innovation, knowledge management, integration, new business creation, venture strategies, new business models
The main drivers of technologies	Automation and mechanization	Information and telecommunication technologies, e-business, computer design, rapid prototyping and their production

The main sources of sustainable competitive advantages	Access to raw materials, cheap labor and capital; cost reduction due to large-scale production	Leadership, teamwork, entrepreneurial creativity, speed; , partnership with the buyer; differentiate strategies; competitive strategies, excellent corporate abilities
The most important resource	Financial capital	Human capital
Decision-making mechanism	Vertical	Distributed
Innovative process	Periodic, linear	Continuous system
Production focus	Internal processes	System management of business processes and the entire chain of value creation
Strategic alliances with other firms	Rarely, the mentality is the same	Partnership for access to new corporate capabilities
Organizational structures	Hierarchical, pyramidal, bureaucratic, functional	Interrelated subsystems; flat, flexible, decentralized, divisional structures, authority of subordinates
Business model	Traditional: command and control	New: the main focus is on people, knowledge and their relationship
Workforce		
Leadership	Vertical	Distributed: empowering subordinates and leadership itself
Characteristics of the workforce	Mostly men, a high proportion of semi-educated and uneducated	Gender equality; a high proportion of employees with higher education
Skill	Narrow specialization, standardization	Wide specialization, flexibility
Education requirements	Certificate or diploma	Continuous learning: the question is not what you know, but how quickly you can learn new things
Relations between managers and subordinates	Confrontation	Cooperation, teamwork, inspiring corporate culture
Employment	Stable	Exposed to market opportunities and risk factors
Subordinates are considered How	Costs	Investments

Source: compiled by the authors based on [16]., [17].

Appendix C

The matrix of initial data for determining the influence of the components of the knowledge economy on the competitiveness of the countries of the world according to the rating of the global assessment of competitiveness

Top 20 countries in the world in the Global Competitiveness rating	R&D (X ₁)	Global Innovation Index (X ₂)	Human Development Index (X ₃)	GCI 2017-2018 (Y)
United States	96.1	61.4	0.924	85.6
Singapore	70.9	58.69	0.932	83.5
Germany	99	58.39	0.936	82.8
Switzerland	82.6	67.69	0.944	82.6
Japan	100	54.72	0.909	82.5
Netherlands	75.9	63.36	0.931	82.4
Hong Kong SAR	49.2	53.88	0.933	82.3
United Kingdom	85.4	60.89	0.922	82
Sweden	81.2	63.82	0.933	81.7
Denmark	77.7	58.7	0.929	80.6
Finland	77	58.49	0.92	80.3
Canada	80.3	53.65	0.926	79.9
Taiwan, China	84.2	52.54	0.502	79.3
Australia	78.8	51.87	0.939	78.9
Korea, Rep.	91	57.7	0.903	78.8
Norway	65.5	53.14	0.953	78.2
France	91.5	54.18	0.901	78
New Zealand	53.1	52.87	0.917	77.5
Luxembourg	51.3	56.4	0.904	76.6

Source: created by the authors based on [478]., [479].

Appendix D**Matrix of raw data for determining the impact of the Knowledge Economy Index on the index of competitiveness of the countries of the world**

TOP - 20	Knowledge Economy Index (KEI) 2017 (X)	GKI 2018-2020 (Y)
United States	8.77	85.6
Singapore	8.26	83.5
Germany	8,9	82.8
Switzerland	8.87	82.6
Japan	8.28	82.5
Netherlands	9,11	82.4
Hong Kong SAR	8.52	82.3
United Kingdom	8.76	82
Sweden	9.43	81.7
Denmark	9,16	80.6
Finland	9.33	80.3

Source: created by the authors based on [480]., [481].

Appendix E

Source data matrix for determining the impact of the knowledge economy on the competitiveness of the countries of the world according to the KEI according to the EBRD version 2020 Europe

TOP – 20	GCI (Y)	KEI, 2021 (X)
Azerbaijan	4.69	4.56
Armenia	4.15	4.51
Bulgaria	4.46	5.18
Croatia	4.19	5.62
Cyprus	4.3	5.82
Estonia	4.85	6.82
Georgia	4.28	4.97
Greece	4.02	5.25
Hungary	4.33	5.33
Kazakhstan	4.35	4.85
Latvia	4.4	5.88
Lithuania	4.58	6.03
Montenegro	4.15	5.04
Poland	4.59	5.63
Romania	4.28	5.01
Belarussia	4.64	4.93
Serbia	4.14	5.13
Slovak Republic	4.33	5.4
Slovenia	4.48	6.65
to Turkey	4.42	4.6

Source: created by the authors based on [482]., [483].

Appendix F

The essence of the approach to the effectiveness of transnational corporations

Economic school	The essence of the approach to the effectiveness of transnational corporations
P. Buckley, M. Keson, J. McManus (1960s)	The effectiveness of a transnational corporation is the maximization of the profits of the corporation as a whole, and not of its separate links, as well as the presence of a global strategy
R. Robinson (1966)	An effective transnational corporation operates in the interests of the host country
K. Christensen, B. Scott, E. Learned, C. Andrews, J. Stopford, W. Guth (1966)	As an analysis of the effectiveness of the transnational corporation, it notes the degree of diversification of its production activities
J. Diebold (1970s)	The effectiveness of a transnational corporation arises from the balance of the following features: 1) access to sources of resources; 2) identification of world economic trends; 3) gaining access to foreign markets; 4) preventing foreign markets and sources of raw materials from being taken over by competitors; 5) bypassing the national antimonopoly legislation of the country where the TNC is based; 6) minimization of the impact of cyclical fluctuations of the economy in the country where the corporation is based; 7) implementation of the benefits associated with the creation of a fully integrated system for conducting large-scale economic operations
J. Rosenau, R. Keohane, J. Knight (1972)	An effective transnational corporation is characterized by a lack of connection with sovereignty
N. Hood and S. Young (1979)	The effectiveness of a transnational corporation is due to a high level of: technologies (creation of new products, specialization, organizational and management experience, knowledge of methods of entering the market and maintaining it, the ability to diversify production, availability of patents, etc.); industrial organization (corporate structure and quality of decisions); management personnel of a wide profile; access to sources of capital on various financial markets and the ability to profitably maneuver it, use fluctuations in currency rates; access to sources of raw materials
U. Dumsza (1972)	The effectiveness of transnational corporations is related to the special structure of the transnational corporation
K. Bartlett, S. Joshal, D. Birkinshaw (1980)	The increase in the effectiveness of a transnational corporation is associated with the evolution of its structure - from multinational to transnational
A. Scott, M. Stolper, R. Walker (1988)	An effective transnational corporation itself creates the conditions for successful activity (agglomeration)
I. Staveren (1990)	An efficient multinational corporation minimizes the use of resources and the corresponding damage to the environment

Source: created by the authors based on [493].

Appendix G

Theoretical paradigms of TNC development

Theoretical paradigms					
TNC as an entity market exchange	TNC as a manufacturing company Function	TNC as an element social relations	TNCs as a whole Resources	TNC as a form organization of transactions	TNC as a coalition resource owners
1	2	3	4	5	6
<p>This paradigm dominates the neoclassical theory, which depicted the TNC as an organization with input resources and output output. The goal of the TNC as an autonomous market entity is to maximize this output, usually in the form of profit or market value. Thus, the role of TNCs in the economy is to transform limited resources into useful goods. At the same time, it is assumed that the market on which resources are purchased and on which produced</p>	<p>TNC is considered as a form of organization of a complex of equipment and technologies necessary for the production of certain types of products or services. This approach is traditionally referred to as technological determinism. Such an explanation of TNCs is relevant for the organization of development, production and effective introduction to the market of technologically complex products. The presentation of TNC as a production function is based on the relationship</p>	<p>TNC is considered as an organization that unites different individuals in all the diversity of their roles, relationships and interests. Individuals act as owners and employees, including managers. And the sustainability of the TNC as an autonomous economic unit depends on how effectively it satisfies the needs and goals of individuals. The main emphasis is not on the contractual</p>	<p>The resource concept of the explanation of the TNC as an autonomous organization is based on a rather broad methodological basis and proceeds from the fact that the TNC is an indivisible unique complex of material and human resources, capable of existing only as a single whole (« bundle of resources”) and only as such providing the TNC with profit and competitive advantages. Moreover, the main explanation for the very existence of the TNC is its ability to generate and develop specific resources that cannot be replicated by other market participants. At the same time, it is fundamentally important that there is a certain line between material and human resources - material assets can be bought or copied, while</p>	<p>TNC exists to minimize the transaction costs of business operations of market exchange. TNC is a way of organizing transactions in conditions of limited rationality of economic agents, when they do not have a real opportunity to obtain and process all information about market parameters. The hierarchical form of market coordination allows TNCs to minimize management and control costs. TNC as a form of organization of transactions arises when the costs of operations in the free market become higher than with hierarchical</p>	<p>Considering the firm as a special form of organization of market transactions, evolutionary and non-institutional approaches focused attention on two main aspects of the firm's nature, which distinguish it from the general context of market relations. First, the firm is considered in this theoretical paradigm as a set (entanglement) of long-term contracts between owners of resources (as opposed to a standard price market exchange). Secondly, as already mentioned, the TNC, in accordance with its nature, generally supplants market relations based on price signals, since the market exchange is replaced by hierarchical relations directed by the administrative teams of the entrepreneur. A set of managed resources creates a basis for entrepreneurial activity built as a hierarchical system of management decisions.</p>

<p>goods are issued, has certain characteristics - completeness, perfection and free information, rationality of behavior of subjects and equilibrium stability of prices. In order to achieve its main goal, the TNC, relying on its available capabilities, is able to make the optimal choice in the market situation, theoretically adequately reacting to the inevitably arising changes and restrictions.</p>	<p>described by it (the function) between the production results and the spent factors. The technical and technological advantages of TNCs, interpreted as a production function, are provided by the possibility of effective selection of specific options for the combination of limited resources. Production capabilities can use technical knowledge available on the market in free access (real technical progress), which is a kind of exogenous factor for TNCs.</p>	<p>mechanisms of the external market environment in which the TNC operates, but on the “male” efficiency factors that operate within the TNC and create the basis of its autonomy from the inside. Sustainable economic autonomy cannot be based on the simple dominance of the interests of any one group of individuals.</p>	<p>human resources generate non-reproducible specialized knowledge and competencies. A TNC is able to survive in the market environment and develop only to the extent that it is able to generate, purchase, maintain and develop its resources.</p>	<p>coordination with the help of administrative management teams. TNC is a way of organizing transactions in conditions of limited rationality of economic agents, when they do not have a real opportunity to obtain and process all information about market parameters. A landmark event in the advancement of economic theory in this segment of knowledge was the famous article by R. Coase “The Nature of TNCs”.</p>	
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Source : created by the authors based on [494].

Appendix H

Retrospective analysis and comparative characteristics of the stages of formation of the knowledge economy in Ukraine

Stage	Stages of growth	Ukraine			West		
		Period	Milestones	Social system	Period	Milestones	Social system
I.	Post traditional society	17th century - the middle of the 19th century	Reform of 1861	Soviet Empire (development elements of industrialism)	16 - 18 centuries.	1760 - Great French Revolution	western empires (great maritime discoveries, elements of industrialism)
II.	Industrial revolution (stage 3)	the end of the 19th century - the beginning of the 20th century	14th Congress of the CPSU	prerequisites for the formation of an industrial model	19th century, mid-19th-mid-20th century.	a series of scientific and industrial discoveries	formation of a capitalist industrial model

III.	Industrial growth (stage 4)	30 - 60 years	the flight of Yu. A. Gagarin	Socialism	70 years	In 1969, N. Armstrong flew to the moon	Capitalism
IV.	The crisis of industrial society	60 - 90 years	the collapse of the USSR	«development of socialism» (or stagnation and restructuring)	70 years	oil shocks, defeat in Vietnam	capitalist society of mass consumption
V.	Post-industrial society	As of today		post socialism (convergence of capitalism)	the border of the 20th and 21st centuries.	Helsinki Agreement	post capitalism (convergence of socialism)
VI.	Information revolution					1991–emergence of public Internet	Globalization

Source: compiled by the authors based on [499].

thirteen	Lviv	4.73	4.83	5.51	7.17	7.05	5.99	4.75	5.61	4.40	5.56
14	Mykolaiivskiy	6.45	6.47	6.13	7.18	7.30	5.16	6,10	6.61	4.22	6.18
15	Odesa	7.46	7.67	7.62	7.95	7.58	8.66	7.86	7.59	6.46	7.65
16	Poltava	5.25	5.31	4.86	4.91	5.67	7.61	5.19	5.24	5.46	5.50
17	Rivne	3.42	3.40	3.57	3.74	3.69	3.02	3.87	3.71	2.81	3.47
18	Sumy	4.23	4.34	6:00 a.m	5.78	5,12	5.52	5.41	4.74	4.22	5.04
19	Ternopilskiy	4.19	4.18	5.71	5.14	5.07	4.31	3.86	4.11	2.85	4.38
20	Kharkiv	7,12	7.26	9.45	9.02	8.41	8,12	8,10	8.34	7.35	8,13
21	Khersonskiy	4.09	4.07	6.71	5.08	4.74	4.73	4.19	5.01	3.59	4.69
22	Khmelnyskiy	4.00	4.60	4.17	5.23	5,10	3.02	3.48	4.01	2.93	4.06
23	Cherkasy	4.01	4.72	5.72	5.14	4.93	2.07	3.72	3.16	2.62	4.01
24	Chernivtsi	4.23	4.41	6.70	5,12	6.06	4.11	4.07	4.16	2.72	4.62
25	Chernihivskiy	4.02	3.87	5.96	5.17	5.00	3.14	3.82	3.13	4.32	4.27
26	m. Kyiv	8.23	8.04	9.38	9,14	9.34	8.01	8.07	8.61	8.94	8.64
27	Sevastopol	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹

Source : authors's development