INNOVATIVE MANAGEMENT:
THEORETICAL, METHODICAL, AND APPLIED GROUNDS

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INTRODUCTION

As the experience from around the world shows, countries that embarked on the path of innovation development often become leaders in economic growth. They provide high standards of life quality of their population. Reliance on innovation and innovative activity is one of the most effective ways to secure and strengthen relative competitive advantages, to strengthen market positions to move towards innovative advancement. This is fair for both individual organizations (enterprises and institutions) and for national economies as a whole.

From these standpoints, this monograph presents the results of a complex scientific research that deepens and develops the methodological, theoretical, methodical and applied principles of management of innovation development at various levels: state, regional (branch), level of individual organizations, etc.

The authors investigate the role of innovation in ensuring the competitiveness of industrial enterprises, which traditionally determines the pace of development of virtually all branches of the national economy. They reveal the role of innovations in ensuring the competitive positions of industrial enterprises. The specifics of the competitive relationship between enterprises and innovators are revealed. Applied aspects of creation and introduction of innovations in communication activities of organizations of high-tech sector of economy are highlighted.

Considerable attention is paid to the tools and methods of strategic management of the activity of innovation-active enterprises. In particular: a comparative analysis of strategic methods in the sphere of industrial enterprises activities is made; the approach to formation of strategy development of their potential is revealed; the existence of the interconnection between scientific and educational projects of universities and research organizations and innovative activity of industrial enterprises in line with the concept of innovation advancement is substantiated; an approach to optimizing their portfolio is proposed.

The peculiarities of innovative development of Ukrainian enterprises in the globalized economy are researched. On this basis, an assessment of the current state and prospects for the development of their innovation activities, a comparative analysis of trends in innovation development in Ukraine and other countries is made. The challenges of the Ukrainian innovation system from the EU countries are outlined. The analysis of market threats and their risk in the foreign economic activity of Ukrainian enterprises and institutions is carried out.

Features of innovative development of separate regions in Ukraine are revealed: Lviv, Odesa, etc. New trends in the management of the development of Ukrainian port infrastructure are shown.

The authors' approaches to the development of market-oriented instrumental management of the economic growth management system of industrial enterprises are described. The approach to constructing a multi-factor model for assessing the efficiency of the innovation market is proposed. The basic problems of construction of an effective system of management of internal communications at the enterprise are revealed. Recommendations for overcoming them are presented. The specifics of socially responsible development of electric power companies are highlighted.

Furthermore, special focus is made on the latest trends in the management of industrial enterprises, in particular: management of knowledge at the enterprise, activation of activities in the Internet environment, etc.

Particular attention is paid to the author's developments concerning the logistic support of innovation activity of industrial enterprises, in particular the formation of marketing channels and the logistic service of innovative products. The authors also reveal some aspects of the new approaches to regulating economic and legal relations on the innovation market.

Prague, 20 March 2018

Illiashenko S.M., Strielkowski W.

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Section 1

The role of innovations in ensuring competitiveness of enterprises

1.1. Introduction of breakthrough innovations as a significant factor of forming a highly competitive company's position

Letunovska N.Ye., Provozin N.V., Vashchenko T.V., Strielkowski W.

Special attention at the present stage of economic development is attributed to the technical progress, innovations, and know-how. Countries compete with each other at the level of development of new innovative and breakthrough technologies.

Breakthrough innovations are, in essence, the creation of new types of products (services) or business models that can significantly affect the market and generate considerable value for their consumers. If according to the traditional strategy of development enterprise focuses its activity on step-by-step innovations, the subject of economic activity is engaged in search of ideas of radically new products and their realization in the strategy of implementation of breakthrough innovations. The idea of breakthrough (subversive) innovation was first formulated by K. Christensen in the book «Dilemma of Innovator», which, by the way, was a favorite book by Steve Jobs, founder of «Apple Inc.» [1]. Subversive innovation cardinally changes the power scales on the market: even yesterday, successful products are becoming irrelevant for their consumers. It is worth pointing out that this type of innovation can often be realized as subversion through the output of products in the lower price segment, when a company launches cheaper, but worse-than-analogue, consumer-oriented product that does not satisfy the excessive complexity and high price of existing on the supply market. A more marketing-oriented approach to the implementation of subversive innovations is through the formation of a new market. The offer of the product of business innovation is so cheap and easy to use that a significant number of consumers, who before its release on the market did not buy the product of this category, will become its users [2].

Subversive innovation is the most attractive among other types of innovations for investing. A typical example of innovation in the «subversion» category is a desktop 3D printer that embodies fundamental technological changes that enable consumers who have never used this type

of printer to receive much cheaper, more affordable, but imperfect printed images [3]. In the field of service provision, for example, a new service can be used for agricultural enterprises that direct seed of oil crops to elevators: by mobile communications, customers have the opportunity to receive not only information about the time of arrival of the car for unloading, but also data of the express analysis of the composition of the seed (variety name, seed moisture content, oleicity, acidity, oleic acid content that are the most important indicators characterizing the quality of the seeds and its suitability for further storage and processing) [4].

The first industrial revolution used the power of water and steam to mechanize production. The second industrial revolution used electricity for conveyor production. The third used automated production with the help of electronics and information technologies. The fourth industrial revolution relies on the third – since the middle of the last century, a digital revolution is continuing in all spheres of life. Technologies merge, and the boundaries of material, digital and biological worlds are erased. «Soon the foundation of economic growth will not be capital or natural resources, but innovation and human ingenuity», said Klaus Schwab, the founder of the World Economic Forum, in one of his articles. His approach turned attention to innovation and the fourth industrial revolution. Weighting in the direction of rational use of resources has a completely understandable reason. Innovations enable higher quality products, stimulate the creation and expansion of economic sectors, market development and education, provide cost savings, economy and the use of alternative raw materials instead of limited natural resources.

Heads of companies express the same idea: innovations that appear with incredible speed violate any forecasts and business plans. Technologies generated by the fourth industrial revolution are increasingly affecting the business world. More and more young, smart companies are emerging, which, thanks to access to the global network, are ahead of business veterans in research, development, marketing, sales and production. Young competitors suddenly become faster, provide better services at a lower price than their predecessors. Consequently, four main effects of the fourth industrial revolution affecting the business can be distinguished: the growth of consumer expectations, the improvement of the quality of goods, breakthrough innovations and the emergence of new forms of organization.

A global survey of company executives in 2017 showed that half of companies believe that innovation efforts have a significant impact on their income increase through sales growth. Every fifth innovation leader company expects a 15% increase in profits in the next five years [6]. Innovation of the company is also a significant factor in the

influx or outflow of talent. Company «Deloitte» (audit, consulting services) found that two thirds of young people in the world are going to change their place of work in the next three years [7]. Companies «Dell» and «Intel» came to the conclusion that two out of five employees will go through low tech in companies [8].

A study of PwC Innovation Benchmark (consulting services) shows that companies that invest more in innovation will focus on breakthrough technologies rather than on a gradual improvement. Of those who reinvest more than 15% of revenues, most are engaged in breakthrough innovations, with more than 40% of them focus only on this [6].

It should be noted that in spite of the significant economic attractiveness of subversive innovations, supporting innovations dominate at the market. P. Doyle also points out the following: if all innovations are accepted for 100%, then fundamentally new ones are only 10% [9]. In addition, he notes, that the most successful are not essentially new products, but new ways of marketing activities. Numerous studies of success in the market for innovative products indicate that about 80% of products originated from ideas generated by the market. Representatives of Hewlett-Packard emphasize that understanding market needs is a key factor in product success [10]. The strategy of supporting innovation is more suitable for market-leading companies, which can consolidate their benefits by gradually improving their own products. It is difficult to compete with a leader supporting innovations even for large companies. For example, we may mention the attempts by «Kodak» to push «Xerox» into a photocopier market. The withdrawal into the market of subversive innovations is more suitable for young ambitious companies that are called «early stage». For example, «Xerox» company was defeated by «Canon», precisely because of subversive innovation of portable copiers.

If managers of the company will be forced to try to adapt the subversive technology to the needs of existing consumers (examples – hard drives, electric cars), they are actually doomed to failure. The experience of successful business representatives in the commodity market shows that an approach is effective when an entity finds a new market that will appreciate the existing parameters of subversive technology. Thus, blasting technology can be seen as marketing rather than technological challenge. An innovation strategy based on analyzing the market needs with the subsequent transition to a lab is more effective than a strategy with a reverse trajectory. D. Moore proposed the technology of marketing innovative high-tech products – marketing of high-tech products. In his opinion, high-tech product is not only a high technology, which itself is the first market innovative product and the beginning of the market of innovations, as well as its application in the form of radical innovative

products and corresponding services, which form the basis of innovations market. In general terms, this is a radical innovation product that requires radical innovation marketing (high-tech marketing) [11]. The success of innovation is determined by a carefully designed strategy. About 80% of leading innovation companies have a well-formulated strategy, while among business entities that have an outdated production and sales policy, such strategy is available in less than half of enterprises.

In the case when the sale of subversive innovations reduces overall production (the new segment of resource utilization is much smaller than the segment that has become irrelevant), it is about closing technologies. For example, the phone replaced the telegraph, digital cameras replaced the film, e-mail reduced the value of ordinary mail. Wal-Mart Corporation, using information technology to manage the supply chain logistics and studying consumer demand, received significant profits and was able to offer consumers lower prices.

As far as future innovations are concerned, numerous studies are being conducted on the development of alternative fuels. The construction and functioning of e-democracy (the form of social relations in which citizens and organizations are involved in state-building and public administration, as well as local self-government through the widespread use of information and communication technologies), if this concept succeeds, can also serve as a good example of the possibility of implementing subversive innovations.

In 2015, Ukraine ranked 45th in the rating of the most creative countries in the possible 139 positions. The index of creativity estimates the country in three indices: technology, talent and tolerance [12]. In the ranking, particular attention is paid to investing in research and development, the number of researchers and patents per capita. In 2017, Ukraine entered the TOP-50 countries in the Global Indicator of Innovation (Figure 1.1). Despite the sufficient positions in the rating, individual positions of Ukrainian business are very low (innovative relationships, technological assimilation, creative products and services, influence of knowledge).

The risk factor for the impossibility of innovations implementation in a company is the professional limitations of corporate specialists when innovations are considered only in the focus of IT equipment. The leader of such way in Ukraine is «Privatbank». Its decision to automate the business process «Corezoid» became the first East European startup, presented in the Amazon web store services [14].

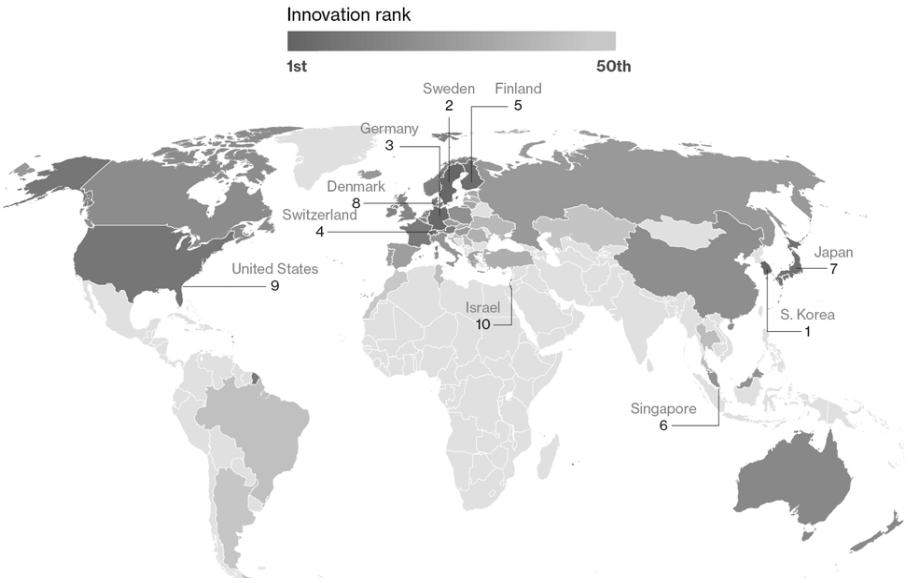

Figure 1.1. TOP-50 most innovative countries in the world according to the rating of Bloomberg in 2017[1] [13]

[1]*Note: gray (from dark to light) highlighted countries located in the first 50th rating*

In recent years, technological parks and innovative business associations have begun to appear in Ukraine. Their goal is to integrate technology into the work of companies from various fields. Among such projects is the opening of the first Ukrainian innovation park «Unit City» with the total area of approximately 27 hectares on the territory of the old Kiev motor-plant, which can accommodate more than a hundred technological companies [15]. This is an important step for the Ukrainian economy, because according to the Nobel Prize winner in the field of economics Robert Lucas, the factors which influence the innovations implementation that cannot always be measured are the following: passionarity (internal aspiration of responsible persons for renewal and development), entrepreneurial activity, spontaneous «Clustering of talents» in one place and at one time. The emergence of a critical mass of people with unique abilities and skills generates an impulse that «feeds economic progress» and stimulates technological development in particular. The McKinsey consulting company refers to the following components of the innovation process: tune in to a large, choose a direction, study trends, understand how to evolve, organizationally be able to innovate, correctly scale the changed aspect of business, maximize collaboration, and mobilize company employees to innovate [16].

By the nature of the interaction among themselves, innovative products in the field of subversive technologies can be divided into twin goods (satisfying the same need, but they differ by name, marketing promotion); derivative products (similar products to their predecessors, but satisfy the existing consumer needs more efficiently or more fully); goods that fit into existing products on the market (mostly for the service sector, when the proposed innovative product in its real reflection satisfies the aggregate needs of its predecessor goods); goods that completely eliminate their predecessors from the market (as a rule, such products arise in the market as a necessity caused by state programs, damage caused by previous products to the environment, etc.); goods complementing the product line of the manufacturer (in this way the product differentiation of the enterprise manifests itself – the already existing and presented on the market products from the range of the company is supplemented by a new one). If the first two points from the listed classification are sufficiently studied, then the emergence of other components of the classification is caused by the current conditions in which there is a market. Thus, an example of products that fit into existing production is the entry into the market of fundamentally new integrated service companies for servicing cars – TIR parks, which are not so much in Ukraine. They accommodate customary services for car wash, tire service, parking lots, etc. An example of products that lead to almost complete withdrawal from the market of their predecessors is LED lamp. This, in particular, is facilitated by state programs for the transition to energy efficient lighting, aimed at the complete phasing out of incandescent lamps. In this perspective, it is also worth considering whether truly innovative on-line approaches to learning (for example, mass open online courses) make favorable changes to the higher education system of Ukraine, as they pose a threat to existing models of studying in the system education, actually destroy the traditional educational system.

Global reaches today are crowd-borne platforms (such as Kickstarter, ICO, etc.) to attract start-up investments, electronic platforms for trade in innovative technologies and services, and open innovation platforms that enable companies to deploy a software environment for their own innovative communities involved in development. All this is combined with global innovation communities with consulting companies. In Ukraine, this approach is represented by the platform Reactor.ua (search for technological innovations and scouting of innovations).

In 2016, Forbes published the first rating of innovative companies in Ukraine [17]. Leaders of the rating became already mentioned «Privatbank»; SC «PA «Southern Machine-Building Plant named after. O.M. Makarov» and the DB «Pivdenne» named after M.K. Yangel

(«Pivdenmash»), which created four generations of strategic missile complexes, more than 400 spacecrafts of various modifications, rocket carriers of the Zenit, Kosmos, and Cyclone family. Design Bureau «Pivdenne» has created unique intercontinental ballistic missile R-36M «Satan» (today it is the only possessor of technology for modernization and extension of its resource). In addition, the DB «Pivdenne» participates in the development of the anti-astringent protection system of the Earth (the creation of modules for the interception of asteroids at a distance of up to 100 million km); «New Post» company, which introduced a number of innovations in the field of logistics, such as: subscribers of this postal operator can transfer funds through their mobile account, transferring them to cash in the company's offices, customers have the opportunity to track the way of their order on-line, the company uses a push-message based on a mobile application (which today has 1,5 million users) to report delivery arrival. «New Post» increases the scope of business expansion: currently offers delivery to more than 200 countries, while also focusing on the «depth» of domestic supply, developing mini post offices. The purpose of the company's owners is to turn it into a brand of «love mark» type. In particular, with this purpose, «New Post» is involved in a number of charity partnerships (for example, in 2017 the company supports the Darina Zholdak Foundation with the «100 000 New Children's Books» campaign).

Currently, the activities of Ukrainian companies in the field of innovation implementation are inherent to newly created companies with foreign capital in particular. The number of innovations introduced by domestic enterprises is shown in Table 1.1.

Table 1.1. Dynamics of innovations implementation by industrial enterprises of Ukraine (formed according to data [18])

Year	Introduced new technological processes, units	Implemented production of new types of products, names
2010	2043	2408
2011	2510	3238
2012	2188	3403
2013	1576	3138
2014	1743	3661
2015	1217	3136
2016	3489	4139

Total costs for innovation activities are shown in Figure 1.2.

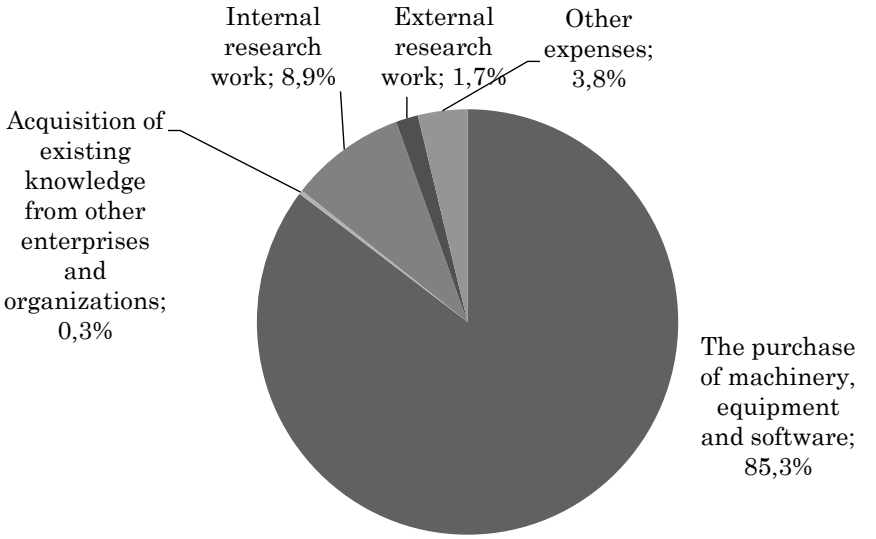

Figure 1.2. Distribution of total expenditures of domestic enterprises in the directions of innovation activity in 2016 (constructed according to data [18])

Ukraine has the potential to develop new technologies and produce innovative products based on them. For example, the country has always been one of the first to apply new technologies in the metallurgy industry. In particular, the first installation of pulverized fuel injection on an industrial scale was introduced in the 70's of the twentieth century. Also, the first continuous casting machine was built in Ukraine [19]. Modern enterprises need teams of «breakthrough business». They must include company employees, as well as business entities that are involved in outsourcing. At the same time, in the tasks of marketing departments, innovation is dominated by support and cooperation with companies-providers that allows to prepare «explosive» marketing decisions – «shocks of offers». For breakthrough innovations comes the turn of supporting innovations.

Thus, the study concluded that companies seeking to be successful in the market and to be the market leader, should focus not only on derivative innovations (supporting) in their activity, but to aim at the development and output on the market of fundamentally new technological solutions – «breakthrough innovations». The experience of domestic and foreign companies shows that the formation in the enterprises of the latest marketing innovative thinking provides opportunities for significant expansion of business.

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1.2. Specific features of competitive relations at innovation active enterprises

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In modern conditions, a competition favors better usage of potential of enterprises and country. It provides the basis for developing a strategy and tactics in the market through efficient use of all resources, the production and implementation of competitive products and profit making.

The competition that exists both in local markets and external ones is characterized by its dynamism and the ability to ensure a rational redistribution of income not only between business entities, but also between economic sectors, the regulation of the proportions of industrial products production, etc. Rapid changes in the conditions of business

entities operation cause an increasing role of product quality, after-sales service and reliability of the industrial enterprise as a whole.

However, the main role belongs to innovations as a means of obtaining competitive advantages and, consequently, increasing the competitiveness of an industrial enterprise. It should be noted that today there is a rapid acceleration of scientific and technological progress, characterized by reduction in the life cycle of not only goods, but also innovations. So, if in 1985 a fundamentally new product appeared on average every 18 months in every branch of the national economy, in 1990 this term decreased exactly twice, that is, new goods began to appear every nine months [1, 2].

The basis for finding competitive advantages is analytical work on the study of the state and trends of market development in general and the activity of competitors in particular. In this regard, special attention should be paid to the diagnostics of the main characteristics of the competitive environment as well as factors that determine its activity. The technology of studying the competitors' activities as the main element of the competitive environment of the enterprise is equally important. An analysis of the competitors' activity, as a rule, is carried out by analogy with the analysis of the production and economic activity of its own enterprise, which does not answer the key issues.

Consequently, the assessment of competitive advantages occurs solely by comparing them between different subjects of economic relations operating within the same business direction. As a rule, the presence of a competitive advantage of an industrial company is determined relatively to the competitor, which has the best position in the market. The competitive advantage can be as internal (it is based on the excellent quality of goods that are valuable to the consumer and can be formed as a result of reducing the production cost of goods or increasing the efficiency of doing business), and external (provides strengthening of the market power of the industrial enterprise, that is, the power of influence on the adoption of the market established by the enterprise prices of goods) [3].

Knowledge about competitors, their real planned actions is the basis for the strategic orientation of the industrial enterprise in a competitive environment. The technology of forming a competition strategy, focused on the use of the strengths of the enterprise in the light of the activity of competitors and the peculiarities of market development, is an important tool for the formation of strategic competitive advantages, especially in the sales policy of the industrial enterprise. The purpose of the strategy is to determine the principles and rules for gaining

advantages over competitors in the target market segments and in the elements of marketing [4].

The fact of individual stages influence of the product life cycle on the efficiency of the industrial enterprise is obvious. An obligatory condition is the establishment of effective interaction between the divisions of the industrial enterprise for ensuring high performance indicators, in particular in the direction of reducing the duration of scientific and technical preparation of innovative products sample, the use of standardized and uniform procedures for production, reduction of variable costs due to automation of production, the appropriate technical support of the production process at the enterprise, the use of tools of functional-cost analysis during planning of expenses, etc. [5]. Therefore, the main factor that conditioned the activation of the above processes is competition.

Competition in innovations is a combination of economic processes of interaction, interconnection and struggle between different economic entities, which is aimed at ensuring the best use of the opportunities for the sale of products and maximum satisfaction of consumers' needs [6].

The entrance of industrial enterprises to the markets for innovative products is due, firstly, to the improvement of its own scientific and technical base and experimental one of research and development. Secondly, the conclusion of contracts with leading research and development laboratories is carried out. Thirdly, licenses, patents for the production of innovative products are acquired. Fourth, financial resources are invested in innovation entrepreneurship [7].

It should be noted that modern entrepreneurship in the aspect of the innovations implementation is characterized by the release of individual and small-scale products. This is confirmed by the fact that the mass production of innovative products in developed countries accounts for less than ¼ of total production [8].

A significant place in the formation of an innovative economy and the maintenance of healthy competition belongs to the state, which policy should be clearly directed at determining the priorities of introducing innovations in production. In particular, the stimulation of the implementation process of research developments is possible through tax and credit policies [9]. World experience confirms the effectiveness of applying environmental and technological standards (norms) along with economic incentives or sanctions. Thus, obtaining by the industrial enterprise of tax or credit privileges, as well as guaranteeing by the state of the reliability of intellectual property protection of economic entities creates favorable conditions for conducting research and development

works, and also the implementation of their results in the economic activities of industrial enterprises.

From the standpoint of a separate industrial enterprise, the introduction of innovations in production should ensure rapid efficiency gains, in particular by reducing production costs, reducing the payback period of the product, etc. [10]. Thus, the capacity of industrial enterprises to implement innovations in production is limited, on the one hand, by the presence of skilled workers with the appropriate knowledge and skills for carrying out research and development works. On the other hand, an increase in the number of innovative products in the market involves an appropriate inflow of capital to the sectorial market and, consequently, the emergence of new competitors, which negatively affects the performance of the innovative products implementation due to increased research costs in order to avoid disputes over the duplication of product properties for already published patents [11].

There are three commonly accepted models for the introduction of innovation activity, based on existing opportunities and motives of the subjects that are directly determined in the scientific literature on management of innovations and ensuring the competitiveness of business entities (Table 1.2).

Table 1.2. Models of innovative activity implementation of industrial enterprises (based on [13])

Model	Essence
I	In the domestic market business entities operate in a competitive environment, having the appropriate motives for implementing innovations in their activities, while in the foreign market they receive monopoly profits (the example of such a model is the British Empire in the 19th century)
II	In the domestic market business entities operate at the expense of obtaining a monopoly rent (profit), which serves as the basis for the introduction of innovative developments as a means of obtaining competitive advantages in the foreign market (real examples of the functioning of this model are Japan, South Korea in the second half of the 20th century)
III	The combination of elements of monopoly and competition within a single market. This state is described by the curve of F. Sherer

The empirical study of the relationship between competition and innovations by F. Sherer confirms the stimulating effect of competition on the introduction of research and development by economic entities [12]. However, it has been proved that there is an optimal point of the intensity of competition in the market (the point of maximum), after

which the intensification of competition intensifies the innovation activity of enterprises. This can be explained by the passive behavior of business entities, which have received leading market positions through the innovations.

In 2011 domestic scientists conducted a study on the interdependence between the level of innovation activity of enterprises and their size in the context of determining the impact of competition on the innovations intensity. Thus, based on the statistics of the State Statistics Service of Ukraine on the share of the largest enterprises in the volume of sales, in the cost of innovation and in the cost of informatization, the following results were obtained [13]:

- 0.16-0.17% of the largest enterprises in Ukraine account for 51-74% of the innovation costs and 54-58% of the informatization costs;
- intensity of innovations implementation among the 20 largest enterprises (by the volume of sales) is 15 times higher than the intensity of innovation activity of enterprises occupying 151-200 places on a similar basis;
- there is a direct relationship between the average size of the enterprise and the volume of expenses for innovations.

The researchers noted that there is a discrepancy in the Ukrainian economy between the level of enterprise's interest in conducting research and design works in order to implement their results in the form of innovative developments and their financial and resource opportunities. Large enterprises are unmotivated to carry out research and, consequently, to innovate without experiencing pressure from competitors. This is exactly the reason for their failure to innovate during periods of instability in the country, while there are innovations that maintain competitive positions in the market during the crisis in the world.

Continuing analysis of the competitive relations specifics of innovative-active industrial enterprises, it is worth paying attention to another problem that holds back the innovation development in the country. It is pricing. In a free market, the price serves a sufficiently flexible factor – the stimulator of competition in the market and, consequently, the trigger of innovation in the industry. The experience of Ukraine shows the inverse effect of this factor. For example, in the retail electricity market there is no competition at all because consumers are not able to influence the pricing policy and tariff grid of the company – the supplier of electricity. The situation is similar in the whole housing and communal complex. Therefore, the state plays a significant role in ensuring healthy competition, stimulating innovation activity.

There is a generally accepted approach of the World Bank in world practice regarding the assessment of state regulation of entrepreneurial activity and the favorable conditions for doing business in general. This study covers the following aspects [14]:

- minimum of capital required for starting a business, as well as time costs and financial expenses for the execution of documents, registration and proper procedures;
- cost and time spent on registration and opening of the warehouse;
- procedures, time and cost of connection to the grid;
- procedures, time expenditures and cost of ownership transfer;
- quality and effectiveness of legislation on movable collateral;
- compliance with the rights of minority shareholders;
- tax burden (total amount of payment for all statutory taxes, time to pay them);
- financial costs and spent time on resolving commercial disputes;
- the spent time and the ease of processing the documents of export / import of products through the port;
- financial expenses, time expenditures, performance and interest rate on condition of financial insolvency;
- the power of legislation in matters of financial insolvency of an enterprise;
- quality of the credit information system, the depth of information on creditworthiness, indebtedness, etc.;
- impact of the remoteness of the enterprise location from the border on the simplicity and ease of doing business.

According to the results of 2014, Ukraine ranked 96th with a rating of 61.52 units from 189 countries. The conditions for doing business are much simpler in Moldova (63 positions in the rating – 66.60 units), the Russian Federation (62 positions in the rating – 66.66 units), the Republic of Belarus (57th position in the ranking – 68.26 units), Hungary (54th position in the ranking – 68.80 units), Romania (48th position in the ranking – 70.22 units), Armenia (45th position in the rating – 70.60 units), Poland (32nd positions in the rating – 73.56 units), Georgia (15th position in the rating – 79.46 units).

In 2017 Ukraine ranked 80th with a rating of 63.90 units from 190 countries. Ranking positions of Ukraine on ease of doing business for the period 2015-2017 are presented in Figure 1.3.

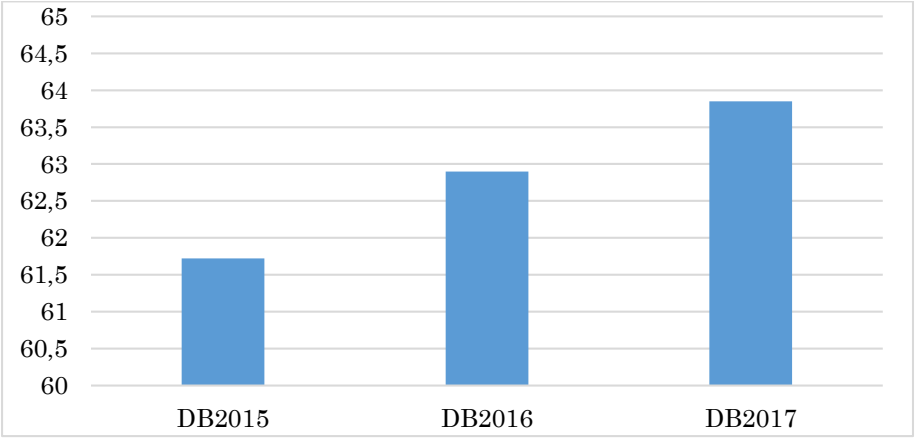

Figure 1.3. Ease of doing business ranking in Ukraine in 2015-2017 (based on [14])

As can be seen from Figure 1.3, Ukraine strengthens its position in the world ranking; however, the current rating position does not provide competitive advantages in the European market.

Reforms in Ukraine that were implemented:

1. *Protecting minority investors*. Ukraine strengthened minority investor protections by requiring interested director or shareholder to be excluded from the vote, by requiring that proposed related-party transactions undergo external review, by introducing remedies in cases where related-party transactions are harmful to the company and also clarifying ownership and control structures.

2. *Enforcing contracts*. Ukraine made enforcing contracts easier by introducing a system that allows users to pay court fees electronically [14].

Analyzing directly the ease of starting a business in Ukraine, it should be noted a significant reduction in the number of procedures, as well as the registration costs. The significant reduction in the length of obtaining licenses and building permits is positive. This was achieved through appropriate reforms in the registration of property rights to real estate and their encumbrances, as well as the implementation of a new simplified system of construction risk assessment and a 5-step classification of construction projects depending on their complexity.

Along with the length of obtaining permits, connection to public utilities, compliance with all formalities and inspections, the number of procedures and the cost of issuing permissions through the abolition of value added tax during registration of business and obtaining construction

permits has decreased. One of the important steps during the time reduction reform is the approval of the president for the company's registration by removing the requirement to obtain a corporate seal license.

A significant contribution to the strengthening of Ukraine's rating positions was recently made by the tax reform, which has significantly reduced the tax burden. This was achieved by simplifying the calculation and payment of the general corporate profit tax, as well as deductions to social insurance funds. Among other things, this led to a reduction in the time required to comply with tax legislation, as well as a reduction in the number of tax payments.

Experts noted positively the ease of access to information on creditors, arrears. The state of international trade has improved, in particular, in terms of simplifying the procedure for verifying customs declarations and reducing the number of inspections.

Summarizing briefly, one should note that the rating of ease of doing business in the country is extremely important for the implementation of innovative developments and the attraction of foreign financial resources. This is due to the fact that foreign investors are guided by this rating because it covers all the most important areas of activity and allows comparing the conditions of doing business in different countries. Ukraine's competitive position is not the best today, but there are some positive developments that make it possible to assert the correctness of the chosen vector of the country's development.

In order to obtain additional income, without increasing the price of products, it is necessary to continuously improve the technological base of production, to introduce the latest technologies and progressive forms of organization of the production process thereby reducing production costs. Business entities that carry out such activities receive additional income. Consequently, competition is a force that provides scientific and technical economic progress.

Returning to the competitive relations of innovative-active enterprises, it is appropriate to note that obtaining and sustainability of competitive advantages is possible only with the effective implementation of innovative marketing, high quality management of the enterprise, and the possession of modern methods of product sales. Horizontal connections between enterprises play an important role in the market of innovative products, in particular, processes of cooperation and integration. Given the continuity of the process of technological development, innovative active competing enterprises in some cases combine their efforts to expand the sphere of influence in the market. In addition, horizontal competition can lead to monopolization of the market through absorption. It is therefore necessary to have strong antimonopoly legislation

and to ensure the efficiency of work in this area of state authorities, especially in strategically important branches of the economy.

Forms of competitive relations today are different. They are examined in Table 1.3.

Table 1.3. Forms of competitive relations (based on [15, 16])

Form	Characteristic
Co-production	Short-term cooperation of business entities to achieve a common goal (joint production of a particular product)
Cooperation	A system of cooperative organizations created to meet the economic, social and other needs of its members. This type of competitive relationship is marked by the long-term partnership relations between business entities
Contracting	Unsystematic, random exchange of information between business entities
Coordination	Long-term interaction of business entities in the information space, aimed at coordinating the actions
Coevolution	Mutually agreed information exchange on future plans and actions to ensure effective long-term development of business entities
Consolidation	Full coordination of measures and actions, the emergence of common economic interests of economic entities whose activities are aimed at their realization

The peculiarity of determining the price of innovative products is the need to take into account complex economic forecasts regarding trends in market development. The higher is the product innovation the less is probability that the forecast will justify itself. Potential buyers are difficult to assess the usefulness of innovation and its economic or any other effect.

Improving the efficiency of enterprises and ensuring their competitiveness is due to the application of new technologies that are constantly updated. The main areas of development of new technologies include the following: the introduction of non-waste technological cycles, the use of continuous production processes and increase of the knowledge intensity of the latest technologies from the perspective of their prospects.

In order to manage successfully the prices of new products, it is necessary to make correct forecasts based on clear and adequate estimates of the dynamics of processes such as [17]:

- competition in time. As many companies try to reduce their research and development periods, as well as the market cycles of their products, to gain pioneering advantages in the market, the number of price changes and new pricing decisions is increasing;

- economic development and structural changes in the economy. The transition of the center of significance in scientific and technological changes from the primary and secondary branches of the technological chain to the rest sectors of the economy takes place in the course of economic development;
- an increase in the number of companies that is observed today, i.e. the «foundation wave», the intensity of which is high in the field of innovative products and services;
- new forms of products supply or sets of products and services supply that require determining the optimal price packages of the company.

Consequently, in determining the price of innovative products, it is necessary to focus on the strategy of the industrial enterprise, to use forecasting methods that take into account competition in time, economic development and structural changes in the economy, the increase in the number of companies in the field of innovative products, new forms of product offerings. At the same time, it is necessary to take into account own expenses for production as always, to carry out a thorough analysis of the break-even point, which will allow receiving additional revenues already at the expense of the best combination of the planned price of the product and the planned volume of its release.

Exploring the specific features of the competitive relations of innovation-active enterprises, it should be noted that the leading role in providing competitive advantages to economic entities belongs to innovations, which is confirmed by empirical calculations by leading foreign specialists.

The economy of developed countries is becoming increasingly oriented towards innovations. It also forms such a system of relations between science, industry and society, in which innovation is the basis of development. In these countries, with the participation of the state, industry and the scientific sector, an innovative system is being built in which the research environment and the economic environment are combined, as well as industrial competition environment, consumer sphere, mechanism of their interaction, orientation of the research environment to meet the innovation needs of consumers.

Competition between the sales channels of innovative active machine-building enterprises in the conditions of globalization of economic processes becomes of paramount importance, because, while producing almost the same range of products with similar properties the main task of the management is to find buyers and conclude contracts for the supply of goods, works and services. The effectiveness of implementing sales policy by machine-building innovative enterprises is to use all available tools in a balanced way, from a pricing policy to managerial training [18].

Competition forces commodity producers to introduce innovative processes and technologies to reduce production costs. In this way they increase the quality of the product and attract the attention of new customers, and thus increase their own profits. In a competitive environment, competitiveness manifests itself always at different levels, which must be taken into account when managing it.

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1.3. Innovation communications within the high-tech sectors development (case of space industry)[1]

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Nowadays the high-tech industries development is a key for integrated model of the economy innovation development. That is why the threats to the national economic security can be neutralized through their development. Under Ukrainian development conditions the high technologies are able to increase traditional economy sectors efficiency, which are in the stagnation state. For example, metallurgy can be essentially different by the share of value added (e.g. traditional metallurgy and space metallurgy). Agriculture can be similarly observed, which can be eco-destructive as it is in Ukraine now or high-technological, stable and effective as it is in Israel.

One of the tools to find institutional changes areas is an analysis of main agents in the innovation process and their interconnection. Particularly, in 2000 H. Etzkovitz in his work «University – Industry – Government: The Triple Helix Model of Innovation» described the model «Triple Helix», which included participation of universities, business and state. Then this concept, interpreted by G. Karavanis and J. Campbell [1], was changed, having been modified into the model Quintuple Helix. It considers two additional spirals – consumers and «environments of knowledge production» as constituents of the institutional environment of innovations and knowledge transfer. The model Quintuple Helix is a base for wider analysis of the innovations development, particularly via social capital [2].

In our previous studies [3] we have justified the expansion of the Quintuple Helix model to International N-Helix model, which shows innovations globalization tendencies (technoglobalism), formation of the innovation nets and intersectoral cooperation. In the context of interconnections expansion, the main problem of the innovation systems is impossibility to realize stable, effective and competitive relations between their main participants.

Thus, the object of the given research is to analyze strategic fundamentals of the institutional and technological planning of intersectoral high tech complexes development, based on the innovation communications on example of space industry.

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We suggest to consider maximum application of the scientific and technical potential of high technologies as a basic principle for the innovation system development in Ukraine for economic growth and social objectives within the intersectoral high technological clusters. Necessity of the given approach is caused by the fact that the total effect of interconnection within the innovation system exceeds effects of separate technologies application.

Space industry is one of the sectors, which has some innovation potential level in Ukraine, is able to provide an essential impetus for economic development, and requires active cooperation between state, small and medium business [4, 5]. This industry takes special place in the global innovation system, integrates modern achievements of the science and technique and catalyzes them.

In study [6] the author has proved, that in the nearest future the space industry will work on the platform principle, around which an innovation net of small and medium companies (SMEs) is being formed. In order to create such a platform, it is important to use institutional planning, where innovation communications play the key role.

The development of the intersectoral high tech clusters and innovation systems is based on the guided communications system (innovation communications, InCo), which are tools, oriented to support interconnections between various subjects while generating knowledge, their transfer and promoting innovation goods.

In the study [7] it is outlined, that opportunities for InCo are promising and studying of key factors, best practice examples, and success criteria for communicating innovation by companies, organizations, and other institutions is very important in the age of innovation globalization.

Among the main innovation communications, we suggest to observe the following ones in our research:

1) communications in the «knowledge triangle» (InCoUniv, InCoSci, InCoCorp, InCoGov, InCoEd);

2) innovation relations in society (InCoNGO – encouragement of innovations through non-governmental organizations, people's creative potential development and their integrations);

3) formation of the innovation communities at various levels (InLoComIn – development of the innovation local community, GloCom – integration into the global InCo-community);

4) development of eco-innovations (InCoEco);

5) communications within the Internet (WebInCo).

This is not full list of possible innovation communications, but we have tried to present the main communications, which are critical for the intersectoral high tech clusters development.

In the Figure 1.4 the main dimensions of innovation communications according to [8], which are derived from the conceptual definition innovation communication and understood as the constitutive elements of the dynamic innovation communication capability.

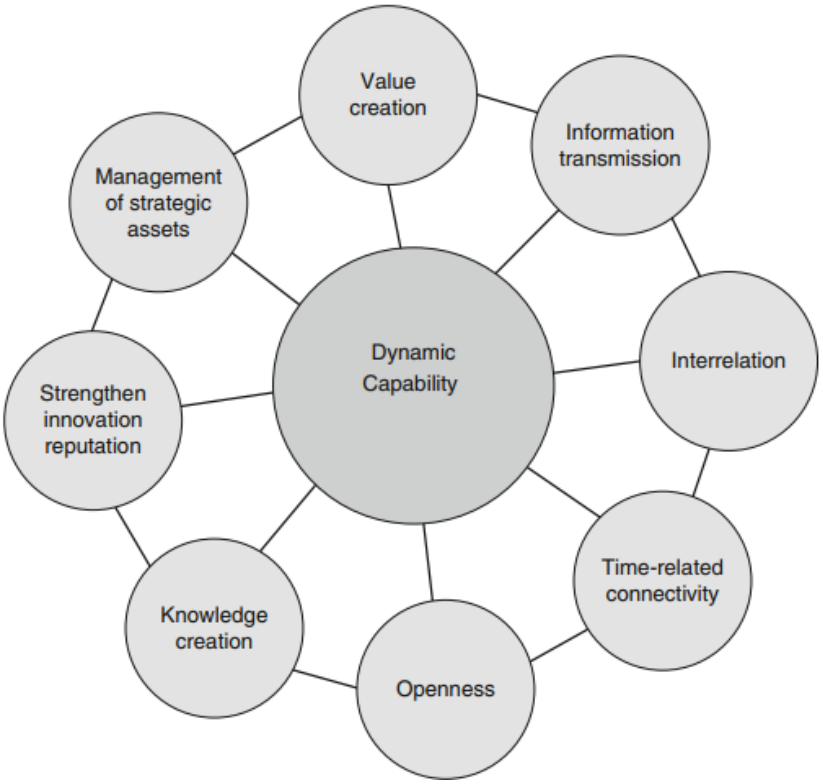

Figure 1.4. Elements of the innovation communications dynamic capability [8]

We also believe, that additionally to elements of the innovation communications dynamic capability we can consider innovation communications within the development resources security analysis [9] and innovation priorities optimization in the context of national technological security ensuring [10] (. Our suggestion deals with the understanding of dynamic capability according to Helfat et al. (2007) as a «capacity of an organization to purposefully create, extend, or modify its resource base» [11].

In the case of this study the space industry role is justified by the fact that it is characterized by the largest value-added chains, which depend

on R&D [12]. That is why, scientific and technological potential and mutually beneficial cooperation play key role for its development. And the role of innovation communications is also growing.

Besides the factor of the current potential development and necessity in the systematic innovation development, it is important to note, that the modern tendency is to provide national security by space states via space component. According to experts' data, 6-7% of EU GDP is provided by the satellite data [13]. The growing support of space systems for economy means that security on Earth will be further related with the security in space. In this case we see an example of intersectoral technology transfer.

According to results of the Ukrainian profile analysis by patent and cluster statistics, we can ascertain conformity of the innovation system specialization to the global trends of the space industry development. However, absence of innovation communications, current investigations use in some products, absence of technologies marketing and state monopolism do not give opportunity to enter the global market with competitive supply (product).

At the same time analysis of the sector trends proves radical changes in the market structure (decrease of entering barriers, development of the space infrastructure, new services). Amount of the global space market is $320 billion, 25% of them is for state sector [14].

Such trends create opportunities for small and medium business, which can use abilities of space technologies. In Ukraine necessity of space industry macroeconomics reconfiguration is caused by the fact that it is one of those, which mostly suffer from «resource starvation» as a result of the long economic crisis and close relationship between geopolitical and business-interests, which lead to destruction of technological linkages.

For the purposes of space industry macroeconomics analytics and development we propose to consider the institutional & technological projecting, which includes the favorable environment for innovation business development, personnel's qualitative training and assisting in formation of innovation relations (InCo).

Now due to the InCo absence the native consumers more often prefer foreign producers' technologies, and the system of knowledge generation is on the decline. Giving preference to the foreign products, a consumer wins, but however state loses, the innovation system of which is degrading.

The InCo rate is caused by the fact, that the threats amount in the high-tech sectors depends on technological package fragmentation (group of technologies, oriented to create a product), which provides

necessity to form active innovation networks for projects realization, particularly international ones [15].

Space industry requires technologies of advanced physics, mathematic modelling, data analysis, programming, robotization, microelectronics, new «smart» materials and coatings, 3D-printing etc. That is why, great perspectives will be opened for start-ups, which work in these sectors, owing to the significant potential of the intersectoral technology transfer.

An important organizational and economic principle of the sector development consists in formation of the state order and its fulfillment by the private sector. The whole modern situation of the applied aspect concerning space industry development is demonstrated by the following situation, when Ukrainian military department does not have any modern space pictures (photos) of ATO zone.

Innovation relations role can be illustrated by the applied aspect of space sector. E.g. the systems of the distant probe of the Earth are very useful for the development of agricultural sector of Ukrainian economy. They are actively introduced in the world and provide receiving of the reliable information about the state of land resources and crops to predict yield and agricultural technologies improvement, analysis of the climate factors dynamics etc.

In the situation with Ukraine, gap of the current chains considering fragmentary character of technologies creates the following development model: analysis of the current potential of the innovation system through technological audit and resources concentration to solve tasks concerning investigation of some technologies set, taking into account criterion of terms and cost minimization, and maximization of key technologies in the sector availability.

The peculiarity of the modern stage is creation of innovation networks to use new ideas of small and medium business. Today sectoral competitiveness is defined by the management efficiency by supplier's chain.

It is well-known, that Boeing, Airbus, General Electric reduce number of details, investigated and produced individually, and give them for outsourcing to small and medium business. For this purpose, they «growth» suppliers, help to develop sectoral start-ups and as a result develop the whole market [6].

It is reasonable in Ukraine to use experience of General Electric, which monitors interesting technologies, appearing at the market, and proposes young entrepreneurs, who develop them, to come into the corporate acceleration. In practice it means, that experts of the company help start-up to orient, and if it is necessary, to elaborate technology and

to work out mechanism of cooperation with General Electric as with a potential customer.

After successful acceleration the company is an industrial partner, stands surety for start-up in relation to investor and guaranties that it will buy innovation investigations. The investor receives the project with completed business-model and set sales channels. The start-up gets an opportunity to enter the market fast, and then to sell its goods to another corporation in the sector. Also, General Electric receives the trusting and loyal supplier and partner.

This mechanism can be useful for the state innovation management within the coordination function.

Also under the current conditions, we suggest to lay on the state functions of the strategic management in the sector as it is done in USA, and to realize main tasks via outsourcing, the tool of which we define virtual innovation structures, particularly clusters, created through the selecting of the organizational and technological resources of various organizations and their integration within the innovation network with the help of different informational technologies and communication tools.

The virtual innovation integration involves relations of the total informational transparency between partners and thus lets to material flows reducing and costs decreasing. In the virtual integration cooperation is maximum flexible, and integration is based on informational flows. Functional environment is formed as it is required: the same agent can be simultaneously a participant of national or international innovation projects or their parts via participation in active networks.

In the context of Ukrainian integration vector and successful experience analysis of use space industry technologies management institution framework, European Space Agency's experience (ESA) should also be used. The activity of ESA is generally based on the principle of active networks formation. It means, that in order to realize a proper task (project), ESA interested participants are united. Therefore, the productive tasks are solved by the industrial firms under control of ESA scientists and engineers.

In the USA technologies transfer is an obligation of NASA as a federal agency. Here an extensive system is working, the peculiarity of which is that it includes the inverse problem – searching of companies, which are able to suggest innovation decision for NASA demands. Innovative Partnership Program (IPP) acts to solve both these tasks. Within the framework of this program possible partners are being constantly searched, with whom further the licensed agreements were concluded to implement NASA technologies for commercial application.

In practice terms, space industry is one of the sectors, which requires development of the whole above communications complex and which can become a hallmark of Ukraine in the global innovation system. Despite the economic crisis, institutional functioning of the sector from the crisis of 2008 remains stable on a global scale, and in several developing countries and economies of OECD, budgets were grown.

So, in the context of InCo development we suggest to observe space complex development as a coherent network of infrastructural objects (agents), which produce goods and give service to study and to use space in the scientific and applied activities. Let us point out that an ability to use the integrated model of the innovation development is caused by the fact that space industry unites all modern technologies of the high-tech group and stimulates development of NBIC-technologies (nano-, bio-, info- and cognitive technologies), that is a base of sixth technological age.

Space industry is developed depending on a number of supporting sectors, particularly IT and tool engineering, which are of special attention in Ukraine. The sector possesses high multiplicative effect and assists developing of the related sectors, being the source of technological investigations, which owing the intersectoral transfer will essentially impact efficiency of economic sectors. According to the experts' calculations, the space technology and information use is able to increase 1,5-2 times the efficiency of various activities (environmental management, planning and control of the territory development, transport, monitoring of the water, forest and agricultural sector, creation of the electronic maps, cadasters etc.).

According to the analysis of Ukrainian profile by the patent statistics we can observe the correspondence of the innovation system specialization to these trends; however, absence of these investigations use in complex (technological package) does not allow to enter into the global market.

So, in Ukraine there is a task to search optimal strategy for the sector development, based on consideration of the fact that the enterprises in the given sector use simultaneously great number of technologies, distributed according to the functional specialization. However, only separate of these technologies and only together with other technologies are crucial ones from the viewpoint of the international specialization.

It is necessary to create communicative environment for coordination and efforts uniting in order to develop the competitive package. The importance of this aspect is reinforced with necessity to extend international cooperation, problems in which uncertainty appears and deprive sides the opportunity to develop strategic cooperation in the long-term perspective.

The figure 1.5 demonstrates the assessment of the technological package of Ukrainian space sector actual state, and also the expected growing of its efficiency through the innovation communications development.

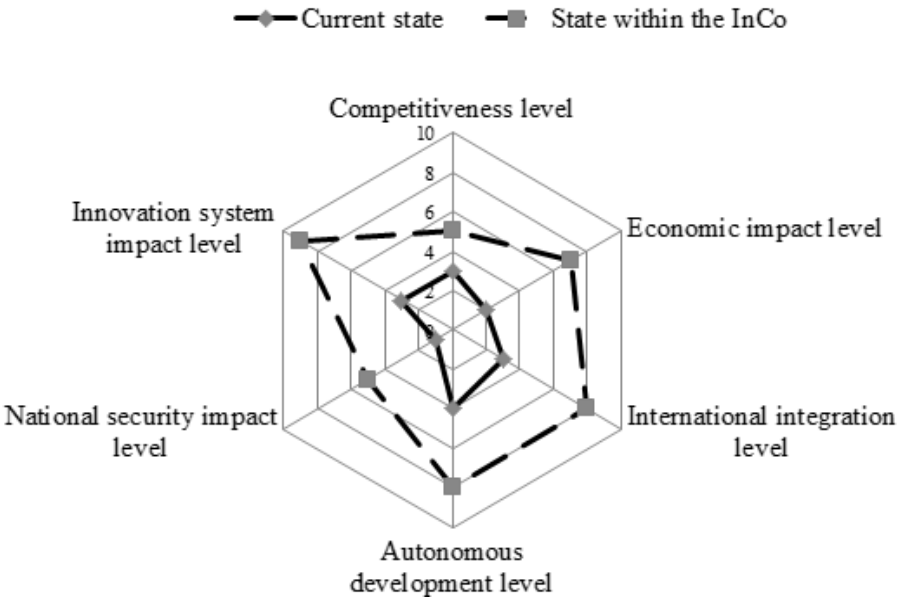

Figure 1.5. Features of technological package in the space industry of Ukraine (author's estimations)

The list of main actions to increase degree of communicative competence at various levels of the innovation system of space industry includes:

1) activation of the international innovation cooperation, which includes collaboration with leading international high-tech companies (including market leaders), international venture funds, small and medium innovation business, engaged in the scientific, innovation and business activity, fellow citizens abroad and their public organizations;

2) introduction of the corporative technological policy, based on foresight, which is open for market participants and company owners (including state);

3) realization of the actions, oriented to extend scientific and productive cooperation, including mechanism of the proposals expertise to use new technological decisions; spreading of the cooperative interconnection practice by organizations of the innovation infrastructure (including within the framework of the innovation clusters and technological platforms);

So, the high technologies development in space industry requires great systematic efforts and is complicated multicriteria task. Particularly, the space industry development under conditions of the open innovations is based on the business interest to technologies and decisions, that are used within the space projects and which have great potential for commercialization on the Earth. Creation of the effective fundamentals for innovation system and business-climate will let to attract attention of small business and foreign companies to the space sector from the viewpoint of collaboration and technologies exchange. Thus, the communicative constituent of the innovation process is important mostly for its economic, commercial and technological aspects as a base of high technologies, which have to be provided with effective management system, functioning in conditions of «great investments – high risks – high profit». One of the main problems at the native enterprises and scientific and research organizations in the high-tech sectors, is absence of personal investigations commercialization experience and legal problems, theoretical knowledge and practical skills in the economy and marketing sector. The given gap can be reduced by InCo establishing practice, which can improve innovation processes efficiency in high-tech sectors.

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Section 2

Strategic management of innovation active enterprises

2.1. Research of methods of strategic analysis of industrial enterprises

Bozhkova V.V., Goreta L.V., Kiseleva L.

Modern tendencies of economic relations of the enterprises of the machine-building industry determine the need for development an integrated approach to the formation of an effective innovation strategy for their development using classical and advanced (or advanced) strategic analysis tools.

Ovsienko N.V. defines strategic analysis as an analysis of the enterprise environment, on the basis of which the marketing plan and future market strategy are being developed in the market [1, p. 14].

Strategic analysis includes, first of all, analysis of a set of factors (external and internal, direct and indirect), which in a complex influence on the efficiency of the enterprise.

Dyolog T.I. emphasizes that when assessing the influence of the factors of the external and internal environment of the enterprise, managers should count the fact that these factors can have both positive and negative impact. In this case, internal factors can cause negative consequences in the external environment, and external – to have a negative impact on the internal organizational environment [2, p. 47].

The purpose of strategic analysis of the development of machine-building enterprises is to determine the factors of strategic success.

Scientists have widely researched various aspects of strategic analysis. So, Bagorka M.O. notes that strategic analysis is an important component of the marketing potential management process and the initial stage of strategy development. His purpose is to select a specific strategy for many strategic alternatives [3, p. 58].

Pecheritsa Yu.V. notes that strategic analysis of the marketing potential of the industry also occupies one of the most important places in the process of strategy formation, since it enables to determine its potential ability to carry out its activity according to strategic objectives [4].

Redchenko K.I. notes that strategic analysis is a comprehensive study of positive and negative factors that may affect the economic state of the enterprise in the long term, as well as ways to achieve the strategic objectives of the enterprise [5, p. 38].

Shurpenkova R.K. considers the strategic analysis of the enterprise as a multi-level study of the external and internal environment of the strategic potential of the enterprise, their interaction, to determine the strategic orientation, on the basis of which the strategy of enterprise management is formed [6, p. 96].

According to Kulakova S.Yu. and Prituly A.I. the level of strategic potential of the enterprise is determined primarily by the potential of the enterprise [7, p.16]:

- own resources and resources of the external environment;
- balance of strategic potential and its adaptability to the chosen strategies of enterprise development;
- the ability of the enterprise management to form a preventive system of strategic development of the economic structure and its potential.

Depending on the type of strategic analysis, distinguish methods of strategic analysis of the external, near and internal environment of the enterprise.

We support Truhan O.L. who relates to the main tasks of strategic analysis [8]:

- determination of the level of competitiveness and advantages of competitive enterprises;
- analysis of the environment of the enterprise, macroeconomic trends and their impact on the future development of the enterprise;
- analysis of the internal environment, personnel potential of the enterprise and its structure.

The external environment is a combination of factors that shape the long-term profitability of an enterprise and to which it cannot influence at all or has a slight flow. The immediate environment is a set of factors that shape the long-term profitability of an enterprise and to which it can affect through the establishment of effective communications. The internal environment of an enterprise is a set of factors that shape its long-term profitability and are under the direct control of managers and personnel of the enterprise [9, p. 14].

Datsenko G.V. stresses the need for the division of internal factors into main and secondary ones. Internal factors determine the performance of the enterprise. Internal secondary factors – these are structural changes in the composition of products, violations of economic and technological discipline [10, p. 199].

Korzhenevskaya V.M. divides the environmental factors into sectoral, global and state-level factors. Sectoral factors are related to the sectoral activities of the enterprise, changes in the industry and the establishment of relations with contractors and consumers. Global factors are associated with the globalization of the market, the level of

development of the world financial market, the market of nanotechnologies and innovative products, the level of international economic competition. State factors are related to the state's economic policy, innovations in technology and technology, the legal field, the investment climate in the country, and the level of shadow economy [11, p. 105].

At the heart of strategic analysis – the study of internal and external (positive and negative) factors of the enterprise, which in the future will be able to affect its economic situation. Its purpose is to assess the most significant factors affecting the current and future state of the entity.

Strategic analysis is aimed at determining the state of economic activity of the enterprise in a specific period of time. In the course of strategic analysis, the assessment of the realism of strategic goals is determined [12, p. 198].

Relevant information, which is the basis for conducting strategic analysis, is facilitated by the effective and well-founded adoption of strategic decisions of enterprises. So, strategic analysis is a means of transforming the information data obtained as a result of the analysis of the external and internal environment of enterprises into a database for adoption by the strategic decision maker.

The strategic potential of the enterprise is the availability of sufficient resources and competencies to develop and implement a strategy that strengthens its competitive position [13, p. 129].

Strategic analysis involves the use of a large arsenal of techniques that were developed mainly by foreign authors and companies and took into account the peculiarities of their activities. However, in our opinion, domestic scientists have not paid enough attention to the issues of the appropriateness of choosing one or another method for conducting a strategic analysis of the relevant enterprises, the possibility of their adaptation to real conditions, the possibility of their application for Ukrainian industrial enterprises, in particular, machine-building enterprises.

The most commonly used methods of evaluating the quality of activities of the company in the West are models presented in the form of matrices, where each business sector (business unit) is positioned graphically in the fields of a two- or three-dimensional analytical matrix. The most well-known methods are the matrices of the Boston Advisory Group (BCG portfolio matrix «growth / market share»), the matrix «McKincey» – «General Electric» («attractiveness / competitiveness»); Portfolio Analysis Model by Shell-DPM (Matrix «Industry Attractiveness / Competitiveness»); matrix firm Arthur D. Little (ADL / LC), based on which is the concept of the life cycle of the industry (economic unit); matrix I. Ansoff; three-dimensional scheme of Abel [14, p. 126].

We consider it insufficient to conduct a one-time analysis of the strategic situation of enterprises using standard methods in connection with the asymmetry of information at domestic enterprises of mechanical engineering. Lack of sufficient experience of market activity and complete (exhaustive) information about the internal state of the more successful competitors (in this case, the machine-building industry) necessitate more careful research and analysis. We consider it expedient to carry out a strategic analysis of the following blocks (Figure 2.1.):

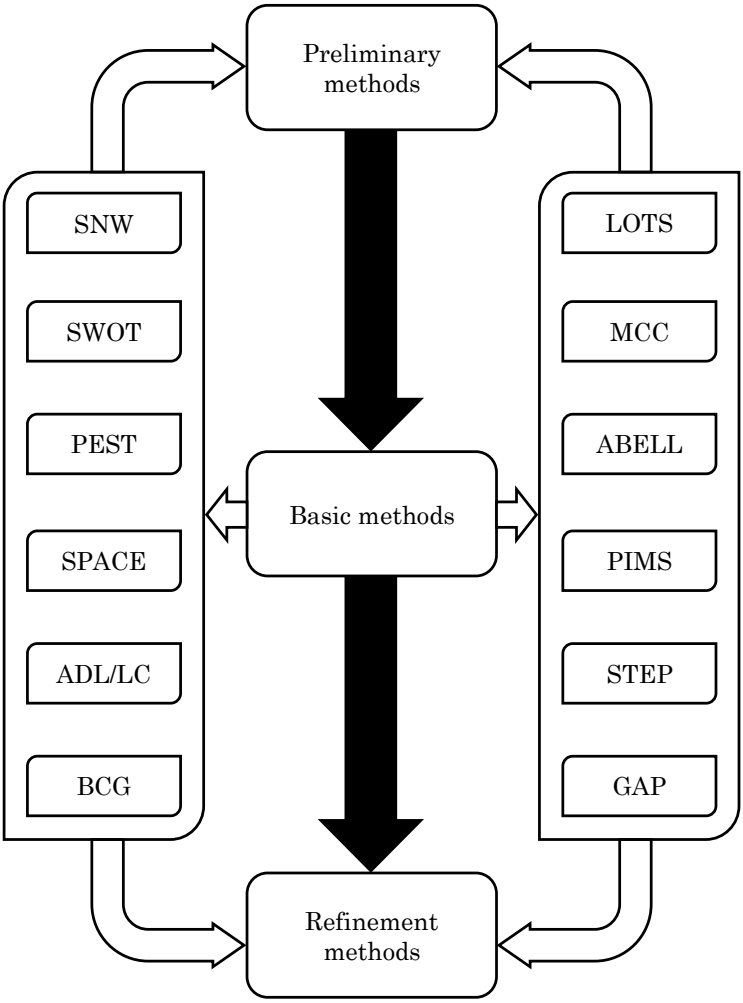

Figure 2.1. Plan of interconnections between methods of conducting strategic analysis of industrial enterprises (author's proposal)

1) *preliminary methods* – allow to analyze the strategic situation of the enterprises of mechanical engineering by gathering information about the existing situation (internal state) of the enterprise, on the influence of factors of the environment on the efficiency of its functioning in order to form an appropriate database for the implementation of the main methods of strategic analysis;

2) *basic methods* – allow an audit of financial and economic activity of enterprises in order to assess their deviation from the underlying condition and indicate the further direction of their development;

3) *refinement methods* – allow to identify additional factors that may affect the competitiveness of the enterprise in the future. In particular:

- use of the same method for analysis in the same periods [15];
- conducting one (in-depth) analysis in one period with additions [16];
- conducting consistently different analysis methods in one period.

Approval of the author's proposals was carried out on the example of the activity of the Sumy machine-building enterprise PJSC Sumy Pump and Power Mechanical Engineering Plant Nasosenergomash [17].

A generalized scheme of using the author's methodology for conducting strategic analysis at an industrial enterprise using matrix models is shown in Figure. 2.2. The using of the first two blocks is described in [18].

At the *first stage (preliminary methods)*, we recommend conducting diagnostics of the enterprise environment – identifying the factors that influence the process of strategic management of the enterprise (PEST-analysis) (using a scale of relative importance) with the further allocation of the factors of the greatest influence and their division into positive and negative factors impact. It will help to structure available information about internal capabilities of enterprises using SNW-analysis (estimation of internal resources of the enterprise), further eliminating the factors of neutral influence, with subsequent allocation of factors influencing the competitive positions of enterprises (strengthening and weakening) and separating them into those describing strong and weaknesses of enterprises.

The *second stage (main method)* is the analysis of competitive perspectives of enterprises – SWOT-analysis based on data obtained during the previous methods: taking, if possible and threatening factors of the greatest influence on the results of PEST-analysis; for the strengths and weaknesses – factors that characterize the strengths and weaknesses of the enterprises as a result of SNW-analysis.

The *third step* is to apply a *refinement method* (for example, to conduct BCG-analysis) to determine the orientation of an enterprise to the manufacture of one or another type of product, which in turn will require the development of new technologies, the provision of the technological

process necessary equipment, the involvement of qualified personnel with the subsequent ability to implement this products in all markets (both external and internal) [19]. So, an additional BCG-analysis will allow an enterprise to determine in the development of an innovative development strategy that the production of products will contribute to the further growth of production.

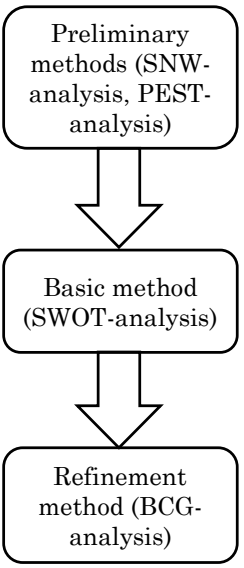

Figure 2.2. Example of application of the author's methodology for conducting strategic analysis of industrial enterprises

Matrix methods play an important role in the strategic analysis of industrial enterprises. They are convenient and therefore have become widespread. However, the use of one type of matrix analysis is not sufficient, since the matrices allow to investigate the strategic state of enterprises from individual parties and do not describe the complete picture. But, in combination with other methods, matrix approaches provide an opportunity for a clear demonstration of regularities in processes taking place at enterprises, and the formulation of correct conclusions when developing an innovative development strategy. Consequently, the most qualitative will be the strategic analysis, provided that the matrices are used in a comprehensive manner, which correspond to the specifics of production and sales of enterprises. When applying them to the analysis of enterprises, it is necessary to take into account the specifics of the industry and the specifics of their production.

The result of the application of strategic analysis methods for industrial enterprises is to determine their potential, to assess the internal and external environment with a long-term orientation that will allow us to choose an innovative development strategy aimed at strengthening the positions of enterprises in the market environment and anticipating their threats [20].

Therefore, we consider it expedient to use the existing models and methods for strategic analysis of the activity of domestic industrial enterprises, provided that they are adapted to the specifics of the latter and features of the functioning environment.

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2.2. The basic strategy of potential development of the commercial enterprises

Garmider L.D., Gonchar L.A.

Focusing of efforts on the solution of tasks of strategic planning, which is based on the selection of strategic alternatives, taking into account external circumstances and needs of maintenance of competitive position, is a characteristic feature of global management. Strategic planning of development of capacity of the enterprise is seen as an essential prerequisite for achieving the strategic goals of the company. At the same time the development potential of the company does not fully meet the requirements of modern trade. All this indicates that work on development of personnel potential is extremely important for Ukrainian trading companies. To ensure the development potential of the company, strategic enterprise management, which is a tool for strategy of development of personnel capacity of the company, should be used. The strategy aims to improve the quality characteristics of human capacity.

Processes of human resource capacity of commercial enterprises.

To present a scientific and a methodical approach to justification of a choice of strategy of personnel potential development of commercial enterprise through the use of diagnostic matrix, thus providing appropriate strategic profile of human capacity in the ratio «phase of the life cycle – a stage of development – the level of development» and to determine the position of the company in terms of development its human resources, according to which the strategy is chosen that contains a set of core competencies, which ensure the implementation of the chosen strategy.

Comparative, logical analysis and synthesis of scientific literature, comparison and generalization methods, mathematical and statistical methods of data analysis.

In our opinion, the strategy of human resources development, which includes organizational training strategy, must be closely linked with the strategy of personnel management. The works of I.L. Petrova [1] A. Vorobyov, S. Zhdanov, J. Kuzmina, M.N. Bogdan, E.O. Mohylovkina, O.N. Gromov, J.M. Ivantsevycha, I.G. Ishchenko, G.A. Dmitrienko, V. Kolpakov, V.V. Buzyreva, M.S. Gusarova, N.M. Chikisheva V.I. Maslov, M.V. Sorokin [2-4] and others are dedicated to the issue of research of human resource management strategies and their classification.

Thus, methodical approach to human resource management strategies demonstrate a wide range of opinions, similar to views on the general (corporate, economic) ideas about a strategy as an instrument of effective enterprise management. However, analysis of the scientific literature

shows that most of foreign concepts of enterprises planning need to adapt to the difficult economic situation in Ukraine, to the specific economic conditions during the formation of market relations. In domestic sources some aspects of the role of human resource capacity in the system of strategic management are not studied enough.

Based on the above analysis of the references and summarizing the results of our studies [5-12], the main factors determining the strategy of personnel potential development of the enterprise, namely: level of human resources development, stage of human resources development, the phase of the life cycle of the company are highlighted. According to the superposition of stages of human potential development and phases of the life cycle of enterprise and levels of personnel capacity development of the enterprise considering approaches to justification of a choice of basic strategy of personnel potential development general recommendations for selection for diagnostic matrix were formulated. The position of the company is defined by three parameters: phase of life cycle businesses, the stage of development of human capacity, the development potential of the company (Figure 2.3).

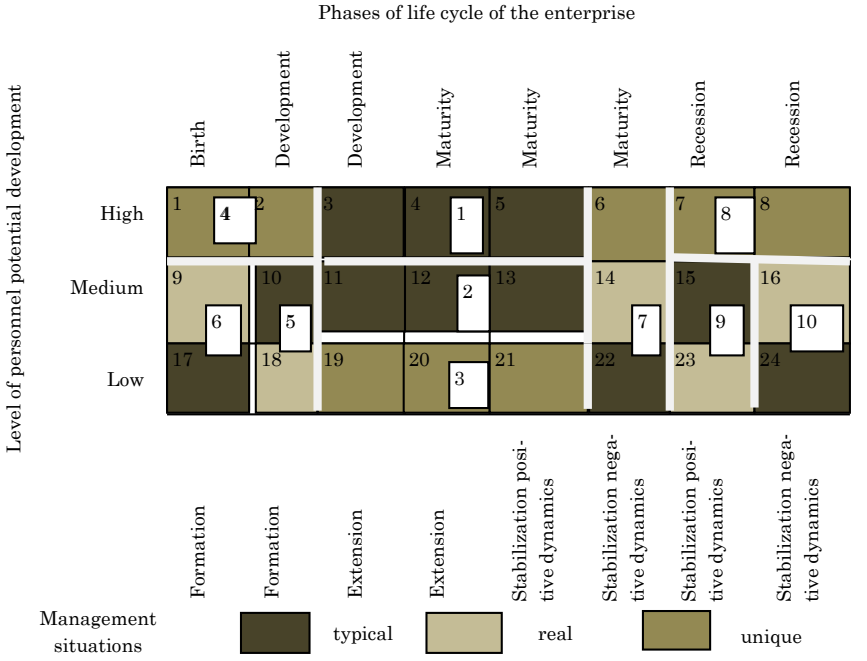

Figure 2.3. Diagnostic matrix «phase of the life cycle – development stage – the level of development» (composed by the author)

Diagnostic matrix allows us to identify areas of human resources, to determine its appropriate strategic profile of the ratio «phase of the life cycle – development stage – the level of development» and the position of commercial enterprises on the development of its human resource capacity (Table 2.1).

Table 2.1. Recommended staff potential development strategy of the company in accordance with the provisions on diagnostic matrix (composed by the author)

Area	№ of Position	Superposition	Level of personnel development	Type of a situation	Possible strategies	
					Small enterprises	Medium and large enterprises
1	3	Extension / development	High	Typical	Innovation strategy. The strategy of accessory	Strategy of consolidation. Innovation strategy. Integrated strategy
	4	Extension / maturity	High	Typical		
	5	Stabilization positive dynamics / maturity	High	Typical		
2	11	Extension / development	Average	Typical	Business strategy. Training strategy. The strategy of improving the service quality	Strategy of career development. Identification strategy. Attraction strategy
	12	Extension / maturity	Average	Typical		
	13	Stabilization positive dynamics / maturity	Average	Typical		
3	19	Extension / development	Low	Unique	The strategy of profitability Strategy of personnel adaptation. Strategy of conservative management	The strategy of use opportunities. Training strategy. Partner strategy Strategy of a circulation (cyclic)
	20	Extension / maturity	Low	Unique		
	21	Stabilization positive dynamics / maturity	Low	Unique		
4	1	Formation / birth	High	Unique	The strategy of use of opportunities. The strategy of accessory. Strategy of personnel economy. Personnel adaptation strategy	The strategy of consolidation. Innovation strategy. Self-preservation strategy. Personnel diversification strategy
	2	Formation / development	High	Unique		
5	10	Formation / development	Average	Typical	Training strategy. Strategy of use of opportunities. Liquidation strategy	Strategy of personnel diversification. Business strategy. Strategy of dynamic growth. Liquidation strategy
	18	Formation / development	Low	Real		

Table 2.1. Continuation

Area	№ of Position	Superposition	Level of personnel development	Type of a situation	Possible strategies	
					Small enterprises	Medium and large enterprises
6	9	Formation / birth	Average	Real	Strategy of personnel adaptation. Stimulation strategy. Partner strategy. Strategy of profitability	Training strategy. Strategy of dynamic growth. Identification strategy
	17	Formation / birth	Low	Typical		
7	6	Stabilization negative dynamics / maturity	High	Unique	Stimulation strategy. Consumer strategy. Strategy of personnel economy. Strategy of survival	Consumer strategy. Strategy of conservative management. Strategy of profitability. Strategy of personnel economy
	14	Stabilization negative dynamics / maturity	Average	Real		
	22	Stabilization negative dynamics / maturity	Low	Typical		
8	7	Stabilization positive dynamics / recession	High	Unique	Strategy of the use of opportunities. Strategy of accessory. Personnel adaptation strategy	Strategy of consolidation. Innovation strategy. Strategy of survival
	8	Stabilization negative dynamics / recession	High	Unique		
9	15	Stabilization positive dynamics / recession	Average	Typical	Strategy of profitability. Strategy of personnel adaptation. Strategy of accessory	Integrated strategy. Training strategy. Partner strategy. Innovation strategy
	23	Stabilization positive dynamics / recession	Low	Real		
10	16	Stabilization negative dynamics / recession	Average	Real	Stimulation strategy. Strategy of personnel economy. Strategy of accessory	Strategy of conservative management. Integrated strategy. Strategy of personnel economy
	24	Stabilization negative dynamics / recession	Low	Typical		

The advantage of this matrix is the presence of specific recommendations within each strategy. Furthermore, it is clear and requires no calculations. The proposed model allows to analyze the nature of changes

that make the profile of human resources, and to consider their interaction for decision making. The proposed approach to the assessment of personnel development gives an idea of the effectiveness of management decisions of its improvement for the benefit of the enterprise.

Depending on ratio «phase of the life cycle – development stage – the level of development» twenty-four possible positions in commercial enterprises matrix are selected. These positions can be located in ten areas. Highlighting the position of specific companies in a particular area is based on the similarity of their characteristics, and, therefore, it enables to use the same type of decisions regarding the development of human capacity commercial enterprises. In diagnostic matrix the following areas are identified: a high level of human resource capacity (area 1); with sufficient level (area 2); unsatisfactory level (of 3-6); the critical level (of 7.10). Areas 1 and 2 show sufficient human resources development and are the most perspective for trade enterprises. Commercial enterprises in the regions 7-10 have characteristic of personnel potential, which is significantly influenced by changing factors, and therefore for the further development of human capacity their efforts should be directed on areas 4-5.

Diagnostic matrix allows us to identify areas of human resources, to determine its appropriate strategic profile of the ratio «phase of the life cycle – development stage – the level of development» and the position of commercial enterprises on the development of its human resources. It should be noted that the proposed matrix of situation diagnosis of human capacity is easy to use, it can also be adapted to the conditions of any commercial enterprise. In addition, the model can include additional criteria's that take into account the specifics of a particular trade on a certain stage of its economic development.

Approbation of the proposed approach was conducted on eighteen trading companies, which were grouped according to the number of employees and the size of the trade area (Table 2.2).

For Group 1 (small) commercial enterprises the superposition 3 is typical (expansion of personnel potential/development of an enterprise); for enterprises from Group 2 (average) – superposition 4 is typical (expansion of human capacity/maturity of the enterprise); For enterprises from Group 3 (large) – superposition 5 is typical (stabilization of personnel potential (positive dynamics)/maturity of the enterprise). The results of expert assessment of the characteristics of human resource potential due to groups of the studied trade enterprises and the calculation of the integral development of human resource capacity is given in [13].

Table 2.2. Investigated commercial enterprises groups
(composed by the author)

Group of enterprises	Name of the investigated enterprises	Average size of a floor space, sq. m.	Average number of staff, pers.
1 (small)	PE «Antonio Biagi», PE «Lagon», PE «Igla», Ltd. «Aquatic», Ltd. «Aquatory», Ltd. «Carlo Pasolini Trading», LLC «Kira Plastinina», Ltd «Textile house»	400	47
2 (average)	Ltd «Omega» (supermarket «Uarus»), LLC «ATB-Market», LLC «Comfy Trade», LLC «Iboya Premium» (supermarket Budapest), TM «ABC-technique», TM «Foxtrot»	6000	110
3 (large)	Ltd «Mall Meteor», TM «Metro», JSC «New Lane», TM «Epicenter K°»	16000	500

Analysis of the received data on diagnostic matrix leads to the conclusion that all three groups of investigated commercial enterprises are in a typical situation that enables the use of typical management solutions and offer the appropriate basic strategy for the development of human resource capacity (Table. 2.3).

Strategies of medium and large enterprises are especially interesting. Considering the signs of the superposition № 4 (extension of human capacity/maturity) which are peculiar to group № 2 (medium) enterprises and characteristics of continuous development of human capacity of trading companies under the superposition, the strategy of innovation was recommended to the group of medium enterprises. It is based on the desire and suitability for innovation, creativity, high the level of cooperation and adaptation to changing conditions and loyalty to the company.

Considering the signs of the superposition № 5 (maturity of enterprise/stabilization of staffing capacity) that belongs to group № 3 (large) enterprises and characteristics of continuous development of human capacity of trading companies under the superposition, the strategy of consolidation was recommended to the group of large enterprises. It is based on formation of the only solid labor working group, which employees observe the ability to work in a team, strive for professional and career growth, and have an aspiration to personal independence and leadership, quality orientation. In front of the investigated commercial enterprises of group number 3 new challenges with a corresponding change of priorities in the formation of human resources will arise. Since it is about development of new markets, we the extension of human capacity will gain some relevance again. On condition of successful implementation of such programs, commercial enterprise will start a new life cycle.

Table 2.3. Recommendations for the basic strategy of staff potential development of the investigated commercial enterprises (composed by the author)

Group	1 (small)	2 (medium)	3 (large)
Typical signs of the superposition	Professionalizing Professional socialization. Formation of individual style of professional activity. Orientation in training on the formation of professional management, standard functions and competencies, goals and values of the company. Accumulation and use of information and knowledge	Advanced training. Retraining. Regular professional training. Personal growth of employees. Encouragement for creativity, initiative. Orientation in training on mastering the tools of efficiency	Career growth and progress. Professional and personal development. Encouragement of production results, quality of work and performance of the set standards of behavior. Introduction of mentoring institute. Improvement of corporate interaction. Expanding of area of responsibility. Maximum attraction to participation in «the business process»
Characteristics of continuous development (CCD) of human resource capacity	Training of new employees. Implementation of adaptation programs for personnel. Problem-oriented professional education, developing necessary for the growth of quantitative and qualitative flexibility in changing conditions. The development of employees' competence in general business development through special programs for managers. The development of management and administration skills for managers	CCD is aimed at further development of employees, reaching maximum results, professional and business skills, knowledge, and abilities. Development of personal plans for staff training. Organization of training programs with taking the personal needs of employees into account	Attracting of staff to innovation. System engineering of problem-oriented CCD in the company as a whole. Training programs for crisis management in the enterprise. Development of personal plans for career promotion. Organization of trainings for fixing of the created management commands, their close interaction
Recommended strategy	Accessory	Innovation	Consolidation
Recommended competence	Innovation activity Participation in shaping the goals and strategy of the organization Thinking outside the box Strategic thinking Art Initiative Teamwork Loyalty	The desire and acceptability for innovation The high degree of cooperation The high degree of tolerance for risk Adaptability to changing conditions Loyalty to the company (focus on long-term performance)	Ability to work in team Desire for professional and career growth Commitment to work Focus on quality Aspiration to personal independence and leadership. Discipline

Thus, summarizing the above, it is necessary to make the following conclusion: each phase of the life cycle of commercial enterprises and stage of development of its human resource capacity corresponds to one of the basic strategies for the development of human resources, which is the methodological basis for determining appropriate strategic directions of development of human resources. The results of the above studies are taken as a basis for further research to determine the competence of personnel that should be developed to implement this strategy and to take them into account when developing quality standards for the development of personnel capacity of the enterprise.

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2.3. The relationship between scientific and educational projects and innovative activities of industrial enterprises on the way of the outstripping development

Golysheva I.O., Gryshchenko O.F., Illiashenko N.S., Masár D.

Today, the perspectives of Ukraine's economy development lie in the area of new model of growth. The analysis of the experience of the most developed countries shows that the major factor for success is providing mechanisms of innovation activity on the business level, as well as on the state level.

The scientific and educational sphere influenced to the development of innovative activity. The training and raising of the qualification level of personnel for enterprises, the development of new technologies of the production and business, the solving of economic development and production problems ae taken part in this area. One of the best methods of interaction between the scientific and business spheres for solving common problems is educational and scientific projects. Under these conditions, the top issue is the development of the national scientific potential, in particular the support or stimulation of educational and scientific projects.

Project management includes many aspects. To begin with, we will consider a concept of the project.

The term «project» comes from the Latin word «projectus» (which was formed from the words «pro» (forward) and «jacere» (to throw)) and means «to throw or cast forward».

There are different interpretations of the concept «project» in the modern literature and in the Internet. However, a big variety of approaches shows that the meaning of the terms is very similar. The classification is given in the figure below (Figure 2.4).

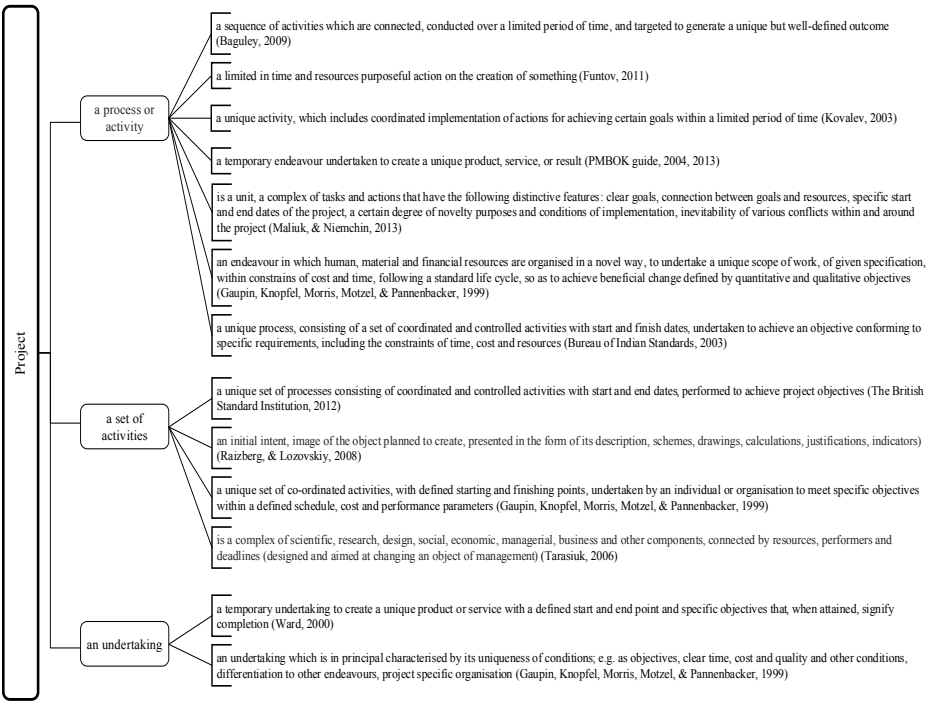

Figure 2.4. A project: the essence of the term

To determine the place of educational and scientific projects in project management it is necessary to analyze different types of projects. The number of factors can be used to define the project classification. The classification of projects presented below (Figure 2.5) was derived from Baguley (2004), Shenhar & Wideman (1997), Project Classification (2008), Shenhar, Dvir, Levy & Maltz (2001) and own observations.

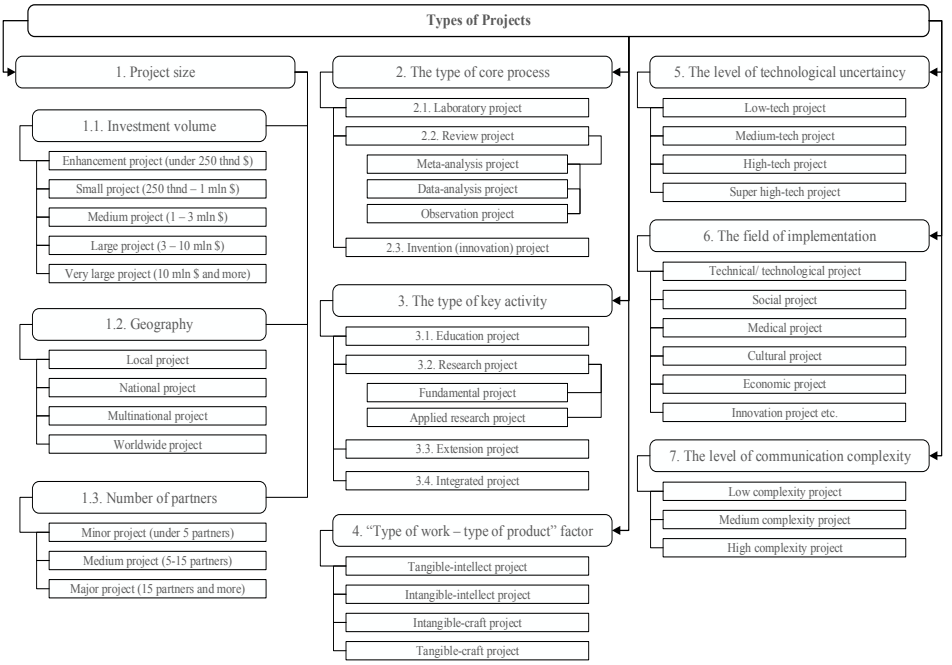

Figure 2.5. The classification of projects

For effective management of educational and scientific projects it is necessary to consider strategies for their initiation and implementation. The authors propose use the push and pull strategies according to Kolodovski (2006). In short, in the frame of pull strategy it is stated that recognition of demand is a more important factor in successful innovation than recognition of technical potential. On the other hand, push strategy states that the discovery of the new capabilities often leads to the more radical innovations. In other words, if project starts with stating a problem and then a solution comes, this is the pull strategy. If the project starts with a solution (technology), and then the problem it can solve defines, it is push strategy. Pull strategy starts with sponsor's initiative to grant something (individual researches or group researches) in specific thematic section (usually addressing global challenges). The sponsor's funding initiative becomes available in the form of challenges. If research team wishes to respond to a challenge, it must submit a proposal according to the admissibility conditions and eligibility criteria before the deadline. Once a proposal passes the evaluation stage a project team starts the project management process. The push strategy assumes the primacy of the research team initiative. Research team has an idea

or technology which needs to be funded. If sponsor wishes to fund, the admissibility conditions and eligibility criteria must be stated. If research team wishes to cooperate with sponsor, it must present a project according to the admissibility conditions and eligibility criteria before the deadline. Once all formalities are settled, the project team starts the project management process.

Any process suggests existence of a definite list of consequent stages of its implementation. Scientific and educational projects are not an exception. Project developers also divide projects into stages to provide better management control and appropriate information flows between project team. It is often said that the majority of authors suggest similar set of stages, but still some differences can be found.

Another important issue in project management is the definition of planning and implementation phases of projects. To determine the stages of the life cycle of educational and scientific projects, it is necessary to analyze the existing approaches in project management. The works of Cooper (2007) and The Office of Energy Efficiency and Renewable Energy (2007) use the concepts of stages and gates in the process of project implementation. Schindlholzer, Uebernickel and Brenner (2011) consider that project process «consists of the three main phases: preparation, design and specification, as well as the sub phases for these three main phases». On the other hand, authors of PMBOK guide (2004) suggest analyzing project stages in a form of project life cycle.

Allan (2001, p. 333) mentions that «all projects involve the cyclical process»: 1) defining the project; 2) basic project planning; 3) planning the schedule; 4) staffing the project; 5) costing the project; 6) developing a communication strategy; 7) project management and reporting; 8) implementation; 9) management of change; 10) project completion.

Munns and Bjeirmi (1996, p. 84) use a six-stage model of the life of a project. The stages being as follows: 1. Conception phase (the idea for the project is birthed within the client organization and its feasibility determined); 2. Planning phase (the method to achieve the original idea is planned and designed); 3. Production phase (the plans are converted into physical reality); 4. Handover phase (the finished project is handed over to the client for use); 5. Utilization phase (the client makes use of the finished project); 6. Closedown phase (the project is dismantled and disposed of at the end of its useful life).

The Tasmanian Government Project Management Guidelines (2011) suggests to use a high-level project management approach. This approach fits most projects at a macro level. The model presented on Figure 2.6 represents an over-simplification of most projects, but it is included to make sense of what, in reality, can be a complex and non-

linear process. It is stated that the project manager needs to consider the eleven key elements: planning and scoping; governance; outcome realization; stakeholder engagement; risk management; issues management; resource management; quality management; status reporting; project review and evaluation; project closure. These key elements must be considered no matter what the size or complexity of the project.

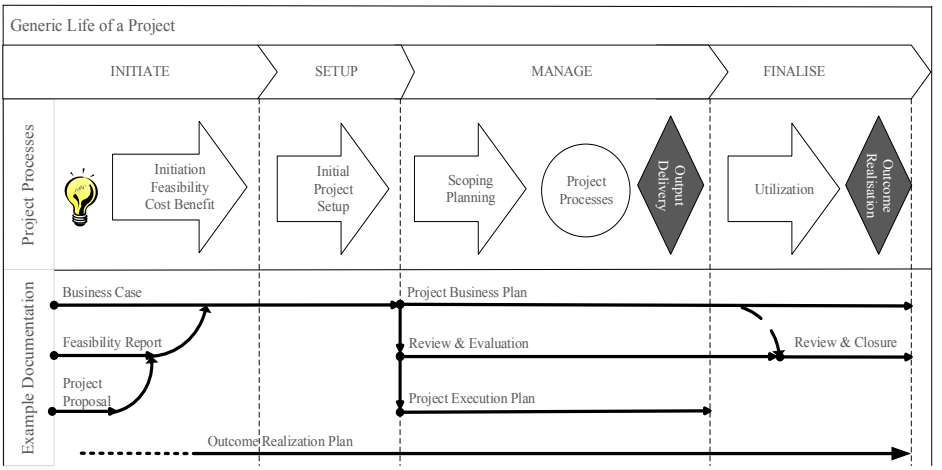

Figure 2.6. High-level conceptual view of the generic life of a project (The Tasmanian Government Project Management Guidelines, 2011, p. 11)

Research of publications on this issue allows to form staged of scientific and educational projects management process: 1) initiating, 2) planning & executing; 3) monitoring & controlling; 4) closing.

It should be noted that information management process within scientific and educational projects must take into account the information flows characteristics (especially it's directions and features) that arise between structural elements. The main structural elements of scientific and educational projects are the following: project team (manager, members), donors (sponsors, creditors), stakeholders, competitors, intermediaries, suppliers, community (external environment, public) and customers. We think it expedient to consider information flows in more detail (Figure 2.7).

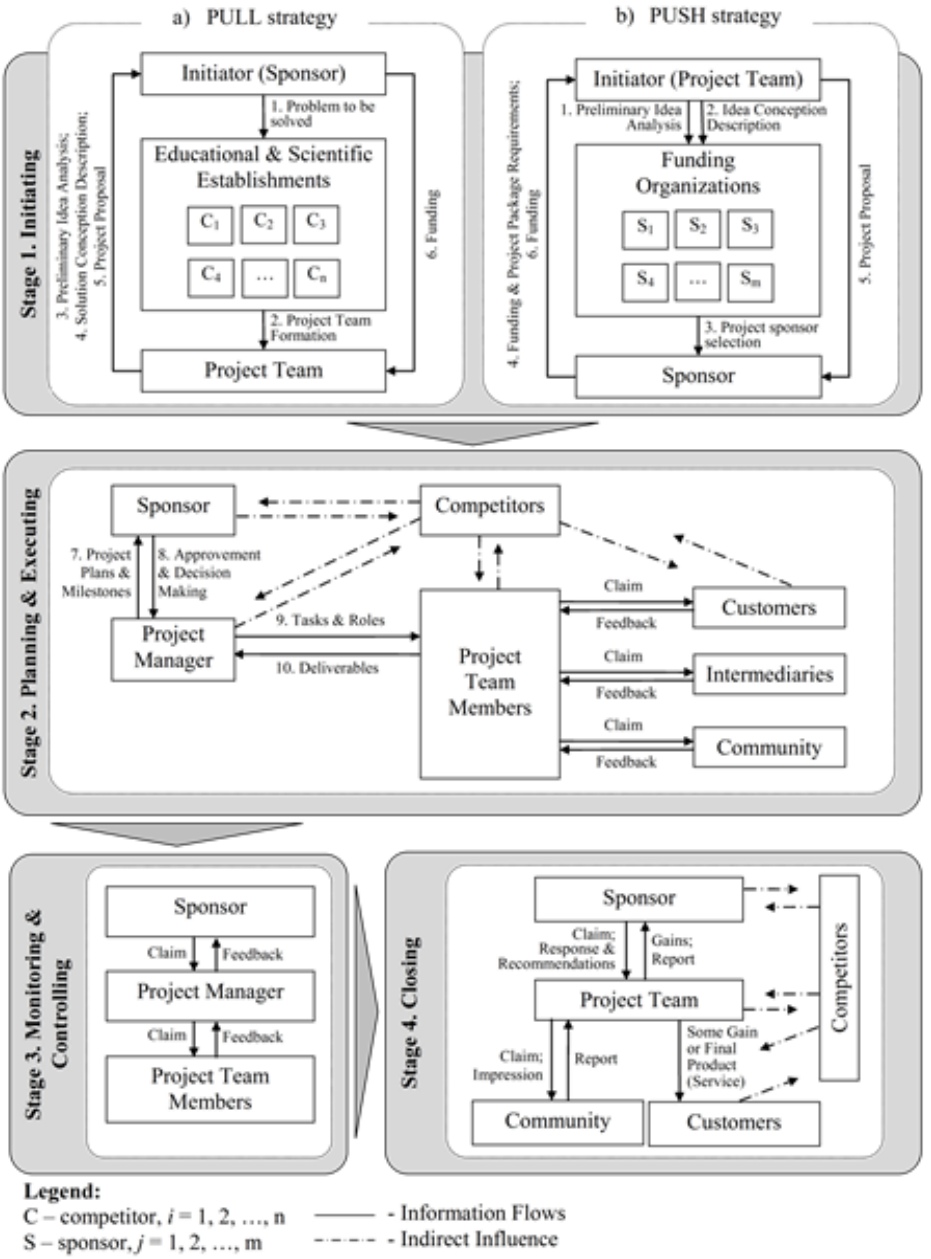

Figure 2.7. Structural and logical scheme of project management process with the indication of the main information flows
Source: Own development

The description of roles performed by main structural elements of scientific and educational projects is presented in the Figure 2.8 (developed on the basis of Brandon (2006); Schindlholzer, Uebernickel and Brenner (2011)).

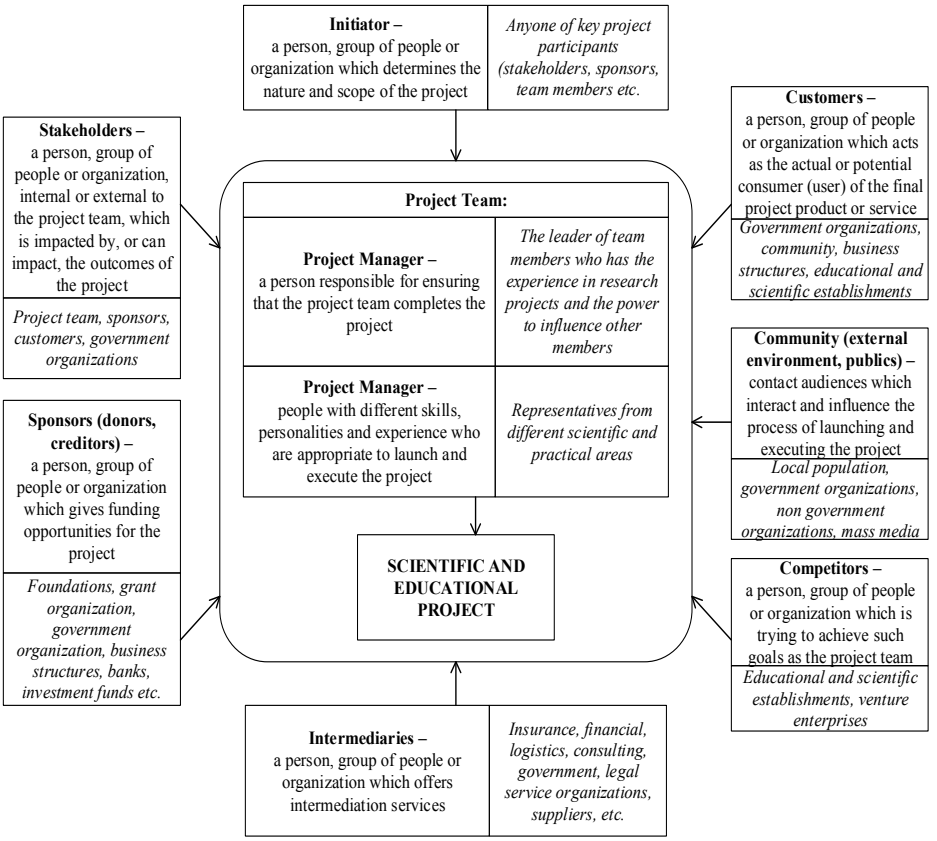

Figure 2.8. Interaction of the main structural elements during the scientific and educational project creation

Munns and Bjeirmi (1996, p. 84) provided the vision how each of the structural elements (project parties) interact with the project during life-cycle (Figure 2.9). The author highlights the role third parties in project management process, which could significantly influence the development and use of a project. Third parties include statutory authorities (both local and national), the media, environmental groups and the general public (society).

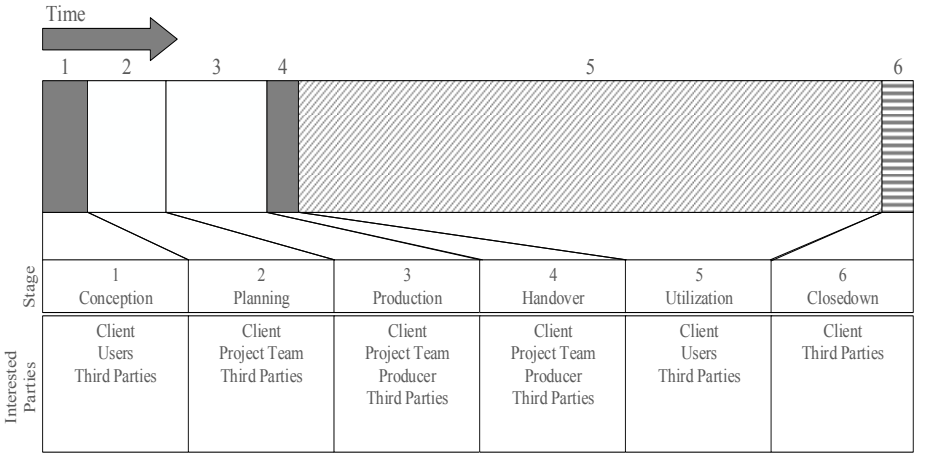

Figure 2.9. The stages in a project life cycle, and the parties interested in each stage (Munns & Bjeirmi, 1996, p. 84)

Every project has to be funded. The problem of the funding forms arises at the very beginning of the project process. A wide range of funding opportunities exists to support programs and projects. In recent years, the funding forms of domestic scientific and educational projects have had slight changes. This is largely due to the European vector of Ukrainian development. As a result, the following forms of financing have become widespread in Ukraine (Figure 2.10).

Most of the forms presented in the Figure 2.10 have been distributed in Ukraine through foreign sources. Therefore, we propose to establish the factors of influence on the level of foreign attraction.

Within the research of impact factors on the funding levels of Ukrainian scientific and educational projects provided by Bilovodska, Golysheva, Gryshchenko, Strunz (2017) a set of hypotheses was formed (Figure 2.11). To verify the hypotheses the data of the State Statistics Service of Ukraine regarding a number of researchers who travelled outside Ukraine for scientific or educational reasons, a share of expenditures on scientific and scientific-technical activities in GDP, a number of organizations involved in scientific and scientific-technical activities were used.

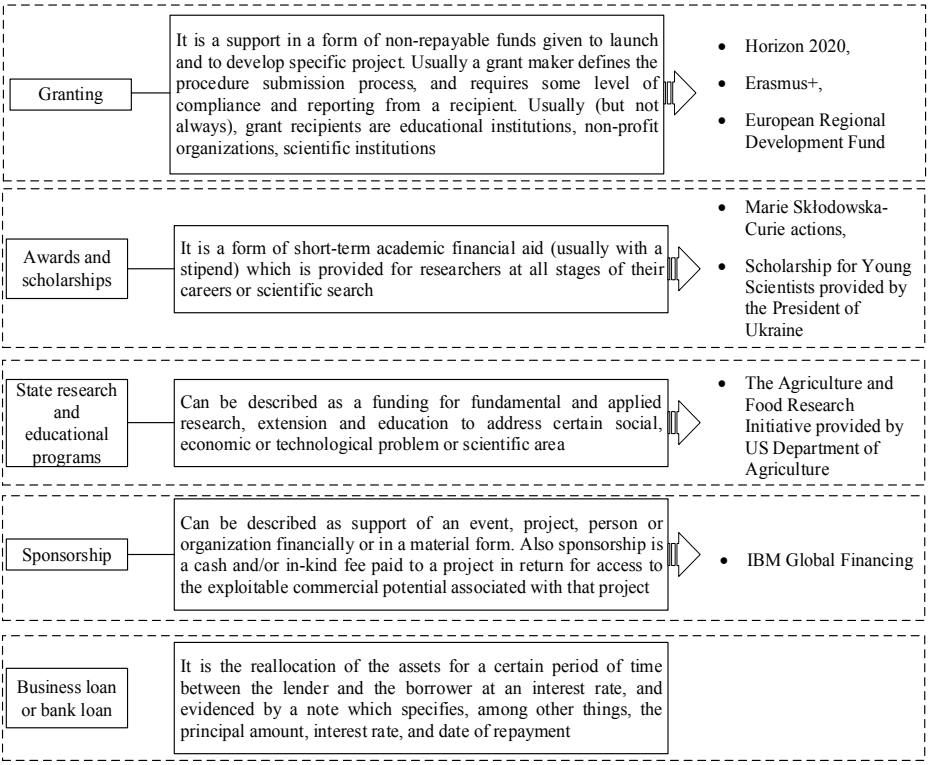

Figure 2.10. Funding forms in the scientific and educational sphere

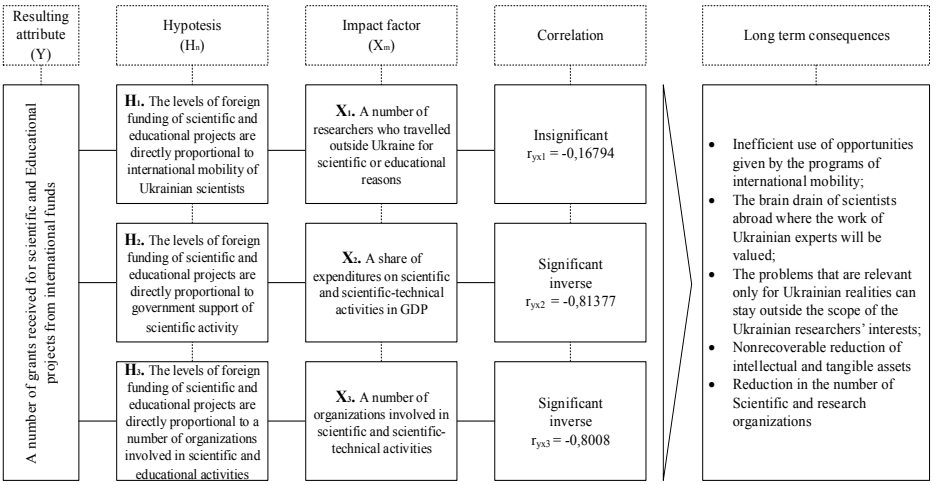

Figure 2.11. The correlation analysis results

The research results show that it is not necessary to rely entirely on foreign funding opportunities. The priority task is to develop research cooperation with the business sector representatives.

In addition to foreign sources of funding for scientific and educational projects in Ukraine, the following sources are also common: state budgetary (including local budgets); own budgets of organizations engaged in scientific and technical activities; funds of public sector organizations; funds of the business sector organizations; funds of organizations of higher education sector; funds of private non-profit organizations; other sources.

Let's consider the dynamics of financing the scientific and technical (including educational) projects in Ukraine through different sources over the past 10 years (Table 2.4).

Table 2.4. Funding for scientific and technical projects in Ukraine by sources of financing
Source: Compiled based on State Statistics Service of Ukraine data

Sources	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
Total, mln UAH	6149,2	8024,7	7822,2	8995,9	9591,4	10558,6	11161	10320,3	12223,3	11530,5
Total, mln USD	1217,7	1525,6	1004,1	1134,4	1203,4	1321,5	1396,9	867,9	559,7	450,4
Total, %	100	100	100	100	100	100	100	100	100	100
Budget, mln UAH	2837,8	3949,7	3429,2	3730	3885,1	4774,6	4826,8	4088,4	4296,4	3910,8
Budget, mln USD	561,9	750,8	440,2	470,4	487,5	597,6	604,1	343,8	196,7	152,8
Budget, %	46,1	49,2	43,8	41,5	40,5	45,2	43,2	39,2	35,1	33,9
Own funds, mln UAH	521,2	592,5	629,4	872	841,8	1121,3	1466,6	1927,8	3003,6	1146
Own funds, mln USD	103,2	112,6	80,8	110,0	105,6	140,3	183,6	162,1	137,5	44,8
Own funds, %	8,5	7,4	8,0	9,7	8,8	10,6	13,1	18,7	24,6	9,9
Organization funds, mln UAH	1725,7	2072,2	1870,8	1961,2	2285,9	2458,4	2306,6	2152,4	2455,9	3741,1
Organization funds, mln USD	341,7	393,9	240,1	247,3	286,8	307,7	288,7	181,0	112,4	146,1
Organization funds, %:	28,1	25,8	23,9	21,8	23,8	23,2	20,7	20,9	20,1	32,4
including: state organizations	-	-	-	-	-	-	-	2,9	2,8	3,1
private organizations	-	-	-	-	-	-	-	17,8	17,2	29,2
higher education organizations	-	-	-	-	-	-	-	0,04	0,04	0,06

Table 2.4. Continuation

Sources	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
private non-profit organizations	-	-	-	-	-	-	-	0,03	0,003	0,02
Foreign sources, mln UAH	978,8	1254,9	1743,4	2315,9	2478,1	2045	2411,5	2043	2222,2	2550,3
Foreign sources, mln USD	193,8	238,6	223,8	292,0	310,9	255,9	301,8	171,8	101,7	99,6
Foreign sources, %	15,9	15,6	22,3	25,7	25,8	19,4	21,6	19,8	18,2	22,1
Other, mln UAH	85,7	155,4	149,4	116,8	100,5	159,3	149,5	108,7	245,2	182,3
Other, mln USD	16,9	29,5	19,2	14,7	12,6	19,9	18,7	9,1	11,2	7,1
Other, %	1,4	1,9	1,9	1,3	1,04	1,5	1,3	1,05	2,0	1,6

** – data for 2016 are presented excluding expenditure on scientific and technical services*

The following conclusions come out of the results of the analysis, Table 2.4:

1. The amount of financing in UAH increased each year. However, if converted into USD, these funding amounts have significantly decreased starting from 2014. This happened due to a significant inflation rate of the national currency.

2. By 2014, 40 to 49% of the total funding came from the state budget, that comprised almost half of the funding for scientific and technical projects in total. Almost 99% of that was the state budget and a small share of budgets of other levels.

3. Since 2014 shares of financing sources have changed. The share of the state budget financing has decreased to 34%. At the same time, in 2014 and 2015, the share of own funding increased twice. However as soon as in 2016, it decreased to almost 10%. This presumably happened due to exclusion in 2016 of such an expense item as the cost of scientific and technical services. This was due to an increasing share of financing scientific and technical projects by orders of various organizations. In 2016, this expense item increased to 32.4% and almost completed with state budget financing as a consequence of both relative and absolute increase of funding from private organizations. In 2016 their share was almost 30% of the total funding.

Based on conclusions of Table 2.4 the analysis of the impact of funding indicators on indicators of scientific, technical and innovative activity in Ukraine is worth conducting.

Firstly, it is necessary to analyze beneficiaries of funding (Table 2.5).

Table 2.5. Financing of scientific and technical projects according to fields of activity and sources of funds

sources of funds	The sectors receiving funds			
	public sector	business sector	education sector	private nonprofit sector
2007				
Total, mln UAH	2318,6	3406,7	423,8	0,2
including (%): budget	86,5	16,4	65	0
own funds	3,3	12,7	2,6	35
funding from organizations	7,3	42,5	25,3	0
foreign sources	2	27	2,7	0
other	0,9	1,4	4,4	65
2010				
Total, mln UAH	3274,4	5156,2	565	0,2
including (%): budget	85,5	10,5	73	0
own funds	4	14,1	2,1	0
funding from organizations	6,6	31,7	19,5	100
foreign sources	3,6	42,2	3,3	0
other	0,3	1,5	2,1	0
2013				
Total, mln UAH	4305,4	6167,6	688,1	0
including (%): budget	86,2	10,5	68,6	0
own funds	4	20,6	2,5	0
funding from organizations	7,3	29,8	22,5	0
foreign sources	2	37,2	4,2	0
other	0,5	1,9	2,2	0
2015				
Total, mln UAH	3996	7573,6	653,5	0
including (%): budget	83,2	7,2	64,8	0
own funds	4,2	37,2	2,5	0
funding from organizations	9,5	25,6	21	0
foreign sources	2,8	27,3	5,8	0
other	0,3	2,7	5,9	0
2016				
Total, mln UAH	3672,2	7133	725,5	0
including (%): budget	77,7	7,8	70	0
own funds	6,9	12,3	1,5	0
funding from organizations	8,5	46	20,2	0
foreign sources	6,4	31,8	6,3	0
other	0,5	2,1	2	0

The following conclusions come out of the results of the analysis, Table 2.5:

1. The sector of private non-profit organizations is the smallest sector of financing. And since 2013, the sector meets no financing and, consequently, carries out no scientific and technical projects.

2. The educational sector performed scientific and technical projects according to various organizations' orders (mostly private entities) comprising about 20% of the total funding.

3. Over the past 10 years, the financing of public sector remains almost unchanged and 80% consists of the state budget.

4. The business sector remains the most financed for the last decade. At the same time, the shares of sources of financing are changing constantly:

- the share of state budget has halved and is 7.8% at present;
- by 2016, the share of own resources of enterprises has been constantly increasing, and in 2015 it amounted to 37.2%, however, in 2016 it has decreased to 12.3%;
- inconstant orders from different organizations reflected in the corresponding share of financing: 2007 – 42.5%, 2015 – 25.6%, 2016 – 46% (with the main share in 2016 obtained from private enterprises);
- by 2010, the share of foreign financing increased three times, but from 2011 to 2016, it dropped again to 31.8%.

It should be noted that resources obtained by business sector were mostly directed at applied research and scientific and technological (experimental) development. The merits are obvious, since the money spent should be aimed at obtaining a clear positive result for the domestic economy. According to innovative countries' experience the main purpose of financing scientific and technical projects is their gradual inclusion to innovative projects. Therefore, the matter of interdependence of scientific and technical activity and innovation activity of industrial enterprises being implemented in the country (as the catalyst for economic development) needs further research. The study was performed using correlation analysis in the Excel package. The results and highest indexes are presented in Table 2.6 (conclusions on the basis of the Chaddock's scale).

Table 2.6. Financing of scientific and technical projects according to fields of activity

№	Hypothesis	The coefficient of correlation	Conclusions
1	The amount of scientific and technical works performed depends on the number of organizations involved in scientific and technical activities	0,94 *a high positive correlation*	Such result is not accidental. Indeed, the more participants in the process, the more processes can be accomplished. However, the probability of performing scientific and technical works is more dependent on organizations of the business sector
2	The amount of scientific and technical works performed depends on the number of organizations engaged in scientific and technical activities in the business sector	0,96 *a high positive correlation*	
3	The amount of scientific and technical works performed depends on the financing of scientific and technical projects	-0,87 *a high negative correlation*	The obtained indicators suggest an inverse relationship between the performance of scientific and technical activities and the amount of their financing. This can increase the initiative in the field of scientific and technical activities
4	The amount of scientific and technical works implemented depends on the financing of scientific and technical projects in the business sector	-0,78 *a high positive correlation*	
5	The number of innovative industrial enterprises depends on the number of organizations engaged in scientific and technical activities in the business sector	0,45 *low positive correlation*	The innovation activity in the country is stirred up both by the concept of «science-push» (on the basis of scientific and technical activities) and «demand-pull» (through market-based marketing incentives)
6	The number of industrial enterprises that introduced innovations depends on the number of organizations engaged in scientific and technical activities	0,58 *medium positive correlation*	
7	The number of industrial enterprises that introduced innovations depends on the number of scientific and technical works implemented	0,66 *medium positive correlation*	The effectiveness of scientific and technological activities (as a share of implemented results in the total number of performed works) strongly affects the performance of innovation activities. However, the impact is directed towards effectiveness of innovation activity through implementation of technological processes, rather than innovative products
8	The number of new technological processes implemented depends on the number of implemented scientific and technical works	0,91 *high positive correlation*	
9	The amount of innovations introduced into production at industrial enterprises depends on the number of scientific and technical works implemented	-0,21 *Low negative correlation*	

Results from Table 2.6 make up following conclusions:

1. Scientific and technical activities are most productive in projects performed by the business sector (the result of hypotheses 1-2).

2. Currently, scientific and technical activities can be effective due to performers' initiatives and not to financing received (hypothesis 3-4).

3. Scientific and technical activities have a certain influence on innovative activity (hypotheses 5-6). And this effect is reflected by innovators' making use of science while creating and introducing new types of technologies and processes. Innovative enterprises work independently with ready-made innovative products, forgetting about results of scientific research.

All these results prove that a joined activity of industrial enterprises and scientific institutions will intensify innovation activities in the country. This is a common practice for most of developed countries.

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2.4. Optimization of the duration of collection of orders on the enterprise's products

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To avoid the problem of risks arising from planning on the basis of demand forecasts, enterprises often focus their work on fulfilling only orders received over a period of time. In this case, there arises the problem of optimizing the duration of the planning period (accumulation of orders). As time of receipt of orders and their volumes have casual character, that at small duration of the period of planning the enterprise will non-uniformly work. This leads to losses associated with either excess utilization of production capacity or downtime. However, with a long duration of the planning period, there is a risk of loss of orders due to long terms of their fulfillment.

Thus, under conditions of fluctuations in current demand, the problem arises of the current planning of production volumes. Her solution requires improving the methods of managing production resources and forecasting demand. At the same time, incomplete definiteness of demand leads to occurrence of risks of losses, which depend on the planning policy adopted by the enterprise. Therefore, ensuring the balance of the enterprise's resources with demand is closely related to mathematical modeling of risks and improvement of risk management in enterprises.

With the idea of a balance in resource management, is closely related the concept of ERP (Enterprise Resource Planning) of information systems that provide complex automation of management in large and medium-sized enterprises [1, 2]. ERP system technologies provide ample opportunities for solving various tasks of production planning. However, they are oriented at certain levels of demand, which act as input data. They do not support decision-making that takes risks into account.

In the last decade, attention to risk management has been increasing, as evidenced by the appearance of ISO 31000: 2009 "Risk Management. Principles and guidance [10]. The notion apparatus of risk management is being improved [11]. With mathematical modeling of risks and managers' preferences in relation to risk are connected the work of many Ukrainian and Russian scientists, in particular, EV Afanasyev, G.I. Velikoivanenko, V.V. Vitlinsky, A.M. Dubrova, B.A. Lagoshi, S. V. Slabinsky, R. F. Suleymanova. E. Yu. Khrustaleva [5-9]. The decisions to optimize production plans by estimating the probability of the volumes of future orders was the subject of our publications [10-11]. At the same time, methods of planning production volumes in conditions of not fully defined demand require development. Therefore, the goal of the work

was the development of a conceptual model that optimizes the duration of the current planning of production volumes (of the collection of orders on products) under conditions of random fluctuations in demand.

For a formalized description of the planning situation, we introduce the following notation: t – the number of products produced per unit time (productivity of the enterprise) at normal loading of production; x – the summary volume of orders arriving behind a unit of time (intensity of demand); $x(t)$ – the summary volume of orders received over a period of time t; $v(t)$ – the products volume that can be produced by the enterprise over a period of time t under normal operation mode, $v(t)=t$; $u(t)$ – the volume of production planned for a period of time t, $u(t)= x(t)$.

In the case when the productivity of the enterprise t and the demand intensity x are deterministic constant values, the resources of the enterprise and the stream of orders will be balanced if $t=x$. Behind the period of accumulation of orders will be followed by an equal in duration period of direct fulfillment of these orders. In this case, for any duration t of the periods of planning and production, there will be no production losses, $x(t)= v(t)$, and to shorten the order fulfillment time, it is advisable to select the minimum duration t of the planning period.

For research of the situation in which the intensity of demand x is a random variable, we represent the planning period in the form of a sequence n of single time intervals D_t, $t=n$, $D_t=n$. Suppose that in these intervals there were volumes of orders $x_1, x_2, \dots x_n$, $x(n\Delta t) = \sum_{i=1}^{n} x_i D_t$. Then the operational effect $S(n)$ for the n planning periods with duration D_t is a value $S(n) = e_{i=1}^{n} S_i$, where S_i – the operational effect in the i-th planning period.

$$\begin{aligned} S_i &= \bar{d}x_i - b(t - x_i), if\ \tau \geq x_i; \\ S_i &= \bar{d}x_i - b(x_i - d), if\ \tau \leq x_i, \end{aligned} \qquad (2.1)$$

where d – the amount of profit from the production and sale of a unit of production; b – the amount of loss per unit of output caused by the payment of «unproductive» salaries to staff in conditions of downtime, the costs of storing unused circulating material resources and «freezing» money spent on the purchase of these unused material resources; d – the value of losses per unit of output, due to overpayments to staff for overtime work and the need for the operational procurement of additional quantities of negotiable material resources at higher prices and etc.

If the planning period has a duration of $t=n$, $D_t=n$, then the operational effect for this period is $S(n) = e_{i=1}^{n} E_i = nE$, where E_i is the operational effect in the i-th unit time interval with the average intensity $\chi =$

$\chi(n) = \frac{1}{n}\sum_{i=1}^{n} x_i$ of the incoming orders for the planned period of time, E_i=$E(i=1,2,\ldots n)$.

$$\begin{aligned} E &= \overline{dx}(n) - b\big(t - \bar{x}(n)\big), if\ \tau \geq \chi(n), \\ E &= \overline{dx}(n) - d(\bar{x}(n) - t), if\ \tau \leq \chi(n), \end{aligned} \tag{2.2}$$

Thus, if as the planning periods are chosen intervals with a duration of D_t, t= D_t, it can be expected that the values of x_1, x_2,…x_n will differ from the productivity t both in large and in smaller side. Therefore, after some planning periods, there will be losses associated with the use of production capacities in the in excess mode, and after others – related with downtime. If the enterprise chooses the planning period n times as much, t=nD_t, and set on his intervals D_t production volume, equal to the average intensity of demand $\chi(n)$, then the deviations of the volumes orders from the productivity of t to the greater and to the lower side will be mutually compensated.

The values of x_1, x_2,…x_n orders volume will be considered as an implementation of $\bar{\xi}_1$, $\bar{\xi}_2$,… $\bar{\xi}_n$ random quantity x of demand intensity, for which there is a mathematical expectation λ and variance of σ_ξ^2. Suppose that for conformity of the resources of an enterprise to a random flow of orders, the enterprise provides a level of productivity equal to the mathematical expectation of the intensity of demand, t=λ. Then, in accordance with formula (2.1), the size of losses $b(t\text{-}x_i)$, $d(x_i\text{-}t)$ will be determined by the expected deviations of the random quantity x of demand intensity from its mathematical expectation λ. At the same time, in accordance with formula (2.2), the size of losses $b(t\text{-}\bar{x}(n))$, $d(\bar{x}(n)\text{-}t)$ will be determined by the deviations $\varepsilon(n)$ of averaged over n time intervals of demand intensity $\bar{x}(n)$, from the mathematical expectation of λ.

To investigate the dependence of the operational effect on the duration n of the period of the accumulation of orders, it is necessary to have the dependence of the expected deviations $\varepsilon(n)$ on this duration. In accordance with the law of large numbers, the probability of δ event, when the empirical mean $\chi(n) = \frac{1}{n}\sum_{i=1}^{n} \xi_i$ differs from the mathematical expectation λ by more than a given value of e>0 , turns for sufficiently large values of n is almost equal to 0: $P\{|\chi(n) - \lambda| \leq \delta\}$. The Chebyshev inequality [12] establishes the dependence of the probability δ on the value n:

$$\delta = \frac{\sigma_\xi^2}{n_\varepsilon^2}, \tag{2.3}$$

If we set the for probability δ her to a small value of P^*, we can obtain from expression (2.3) an expression for the dependence $\varepsilon^*(n)$ of the maximum deviation modulus $\varepsilon^* = |\chi(n) - \lambda|$ on the duration n of the planning period:

$$\varepsilon^*(n) = \sqrt{\frac{\sigma_\xi^2}{nP^*}}, \qquad (2.4)$$

It is obvious that the realizations of the value $\chi(n) = \frac{1}{n}\sum_{i=1}^{n}\xi_i$ and the average value x of the demand intensity take their values within a certain limited interval $[0, x^{max}]$.

It can be seen from formula (2.4) that for a fixed duration n of the planning period, with a decrease in the probability P^* of events for which $|\chi(n) - \lambda| > \varepsilon$, the quantity $\varepsilon^*(n)$ increases. If $P^* \to 0$, then $\varepsilon^*(n) \to \infty$. Therefore, formula (2.4) will be valid for small values only if the duration of the planning period n is not less than a certain minimum value n^{min}. Otherwise, the maximum deviation estimate $\varepsilon^*(n)$ will formally admit the possibility of either negative values of the empirical averages $\chi(n)$, or of such their values, that exceed the maximum possible intensity of demand x^{max}.

For definiteness, we shall restrict our discussion to such random quantities ξ of demand intensity for which the distribution functions $F_\xi(z) = P\{\xi \le z\}$ are symmetric functions with respect to the mathematical expectation λ: $F_\xi(\lambda + \varepsilon) - F_\xi(\lambda) = F_\xi(\lambda) - F_\xi(\lambda - \varepsilon)$ for all $0 \le \varepsilon \le \lambda$. In this case, the functions $F_\chi(z)$ distribution of random variables $\chi = \chi(n) = \frac{1}{n}\sum_{i=1}^{n}\xi_i$ also turn out to be symmetric: $F_\chi(\lambda + \varepsilon) - F_\chi(\lambda) = F_\chi(\lambda) - F_\chi(\lambda - \varepsilon)$ for all $0 \le \varepsilon \le \lambda$.

In accordance with the law of large numbers, the random variable $\chi = \chi(n)$, for which $|\lambda - \chi| \le \varepsilon(n)$, is realized with a probability of at least 1-P^* or on the interval $[z^*, \lambda]$ or on the interval $[\lambda, 2\lambda - z^*]$, where $z^* = z^*(n) = \lambda - \varepsilon^*(n)$. It follows from the symmetry property of the distribution functions χ that the probability of realizing the value of χ in each of the intervals $[z^*, \lambda]$ $[\lambda, 2\lambda - z^*]$ is no less than $0{,}5(1-P^*)$. Since $P^* \approx 0$, we assume that the value of χ is realized at each of these intervals with the probability of 0.5. We introduce the following notation: $\rho_1 = \rho_1(n)$, $\rho_2 = \rho_2(n)$, $\rho = \rho(n)$ is the mathematical expectation of the deviation values $\rho_1 = \rho_1(n) = \lambda - \chi$, $\rho_2 = \rho_2(n) = \lambda - \chi$, $\rho = \rho(n) = |\chi(n) - \lambda|$ on the intervals $\lambda - \chi$, $\chi - \lambda$; $|\chi(n) - \lambda|$, $\overline{x_1} = \overline{x_1}(n)$. $\bar{x} = \bar{x}(n)$ – the mathematical expectation of the value χ on the intervals $[z^*, \lambda]$, $[\lambda, 2\lambda - z^*]$, $[z^*, 2\lambda - z^*]$. Then:

$$\rho_1 = \rho_2,\ \ 0{,}5\rho_1 + 0{,}5\rho_2 = 0{,}5\rho,\ \ 0{,}5\overline{x_1} + 0{,}5\overline{x_2} = \bar{x}$$
$$\bar{x} = \overline{x_1} = 0{,}5(\lambda - \rho),\ \ if\ \lambda \geq \bar{x}; \qquad (2.5)$$
$$\bar{x} = \overline{x_2} = 0{,}5(\lambda + \rho),\ \ if\ \lambda \leq \bar{x}\ (n)$$

When estimating the expected values $\lambda - \chi(n)$ and $\chi(n) - \lambda$ of deviations, we assume that if the value χ falls into the interval $[z^*, \lambda]$ or into the interval $[\lambda,\ 2\lambda - z^*]$, its most probable value $\bar{x}(n)$ corresponds to the middle of these intervals $\lambda - 0{,}5\varepsilon^*(n)$, $\lambda + 0{,}5\varepsilon^*(n)$, i.e. what:

$$\rho = \rho(n) = 0{,}5\varepsilon^*(n), \qquad (2.6)$$

Let's assume that because of the possibility of above-normative loading of production capacities, the guaranteed total execution time of individual orders (from the moment of receipt of the order before to the release finished product) does not exceed the duration of the collection of orders. Let us express the dependence $\lambda(n)$ mathematical expectation intensity of demand λ from the duration n of the planning period in the following form:

$$\lambda = \lambda(n) = \lambda_0 \frac{(n_1 - n)^C}{(n_1 - n_0)^C},\ \ \text{if}\ n_0 \leq n \leq n_1, \qquad (2.7)$$

where n_1 is the minimum duration of the planned period that is unacceptable for all customers, $\lambda(n_1) = 0$; n_0 – the maximum duration of the planned period acceptable for all customers; C – parameter of the function, which affects the rate of decrease in demand intensity, $C \in (0,1)$. Function $\lambda(n)$ can be determined on the basis of data on the intensity of demand for individual customers and the results of their interview about the maximum acceptable for each of them the deadline for fulfilling orders.

In accordance with formulas (2.2), (2.5), the magnitude of the effect *E=E(n)* on the unit interval of time D_t, obtained in the process of fulfilling the average volume of orders received during period $t=n$, expresses the following formulas:

$$E = f_1(n) = 0{,}5\big(1 - r(n)\big)\bar{d} - 0{,}5\ b\ \rho(n), if\ \tau = \lambda(n) \geq \bar{x}(n),$$
$$E = f_2(n) = 0{,}5\big(1 + r(n)\big)\bar{d} - 0{,}5\ d\ r(n), if\ \tau = \lambda(n) \leq \bar{x}(n), \qquad (2.8)$$

The average magnitude of effect $\bar{E}=\bar{E}(n)$ on the unit time interval D_t received in the process of fulfilling the average volume of orders for the period t=*n*, is defined as follows:

$$\bar{E}(n) = f_1(n) + f_2(n) = l(n)\bar{d} - 0{,}25(b+d)e^*(n) \qquad (2.9)$$

In accordance with formulas (2.4), (2.6), (2.7) this formula can be represented as:

$$\begin{gathered} \bar{E}(n) = l\bar{d} - y_2 n^{-0{,}5}, if\ n^{min} \le n \le n_0 \\ \bar{E}(n) = y_1 l(n_1 - n)^c - y_2 n^{-0{,}5}, if\ n_0 \le n \le n_1 \end{gathered} \qquad (2.10)$$

where $y_1 = l(n_1 - n)^c \bar{d}$, $y_2 = 0{,}25(b+d)\sqrt{s_x^2 (P^*)^{-1}}$. As can be seen, optimal duration n^* of the planning period, which provides a maximum of the average effect $\bar{E}$=$\bar{E}(n)$, is found from the condition: $\bar{E}(n^*) = max\{\bar{E}(n)|n\ O[n_0, n_1]\}$. Since the quantity n in the interval $[n_0, n_1]$ can not be large, the value of n^* can be easily found by simply listing the values of $\bar{E}(n)$, n=n_0,n_{0+1},…n_1.

So, here is presented a conceptual model for optimizing the duration of collection of orders on the enterprise's products in conditions of random fluctuations in demand. It should show the usefulness and the possibility of this optimization. At the same time, some simplifying assumptions are used in the model, which require more detailed representation and analysis for the practical application of the model. The introduction of the model also requires a computer software product that will provide information support and calculations. This is the subject of future research and development.

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Section 3

Features of innovative development of Ukrainian enterprises in the globalized economy

3.1. Current state and prospects for the development of innovative activity of industrial enterprises in Ukraine and the world[2]

Sager L.Yu., Syhyda L.O., Gryshova I.

At the present stage of the development of society, there is a transition from a reproductive to an innovative type of development, which simultaneously opens up great prospects for individual countries in particular and society as a whole, but, unfortunately, at the same time generates risks.

Given the current trends, it becomes clear that the national innovative development can be achieved only through the development of various industries on an innovative basis. This applies primarily to industry.

According to [1], it is possible to single out the main barriers to the modern industrial policy of an innovative nature, in particular:

- economic and political instability;
- tendency towards migration of highly educated youth and scientists;
- low level of development in innovative infrastructure and weakness of institutes for development;
- lack of developed financial system with the participation of the state, which can support lending to the economy, aside from innovations that have heightened risks;
- weak venture funds and an undeveloped system for regulating their activities, as well as taxation.

These barriers are global in nature and their solutions, first of all, depend on the government, although each individual innovative industrial enterprise can contribute to the formation of an industrial policy of an innovative nature.

To better understand the essence of innovation, we will focus on the approaches to classification of innovations in terms of the level of novelty (the depth of changes that are made in the sphere of their creation and

[2] The paper was written according to budget money from the Ministry of Education and Science in Ukraine, given to develop research topics № SR 0117U003928 «The mechanism of management of the formation of strategies of outstripping innovative development of industrial enterprises»

use) and the types of strategic behavior of innovatively active enterprises in more details.

So, according to innovative potential and degree of novelty, Prygozhyn A.I. [2] determines radical, combinatory and improving innovations. Ilienkova S.D. [3] separates radical (basic), improving and modifying innovations in compliance to the depth of introduced changes. In turn, according to the level of novelty N. Chukhrai and R. Patora [4, p. 15-16] define radical (the introduction of discoveries, inventions, patents) and ordinary innovations (know-how, rationalization proposals). For the degree of novelty, Glushchenko L.D. identifies basic, perfecting and elementary innovations [5, p. 97], Based on the level of novelty, I. Lutsykiv presents radical, relative and improving innovations [6, p. 91-92]. Illiashenko S.M. [7, p. 14] distinguishes the following types of innovations in terms of the level of novelty:

- radical (pioneer) innovations, based on discoveries, they usually cause the creation of new branches of production and consumption, new markets, the formation of new relations in various spheres of human activity, and the like;
- ordinary innovations, based on inventions or new solutions; they make significant changes to traditional industries;
- improving innovations, based on rationalization proposals; they develop traditional products, technologies, management methods and the like.

In addition, Shkola V.Yu. [8, p. 76-78] proposes to consider modifying and replacing innovations as variants of improving, where modifying innovations mean new modifications of existing goods within the reached level of development of the corresponding technical system. And replacing innovations are new improved models of existing goods, reflecting the growth of main technical parameters, that is, the evolutionary development of technical system in accordance with the state of socio-ecological and economic systems.

In prospect we will adhere to the opinion of Illiashenko S.M. [7, p. 14], taking into account the view of Shkola V.Yu. [8, p. 76-78], and consider radical, simple and improving (modifying and replacing) innovations.

The enterprises are engaged in the production of the corresponding innovations with different levels of novelty, they also differ in the level of their innovative activity and act in accordance with innovative development strategy they have chosen.

According to the type of strategic behavior, all innovatively active enterprises are divided into four groups: explerents, patients, violents and commutants. Each type of strategic behavior provides for the use of enterprises by various innovative strategies and, accordingly, the production

and distribution of products with different levels of novelty. Table 3.1 shows the relationship between the type of strategic behavior of enterprises, the innovative strategies that they use, and the type of innovation in terms of the level of novelty that they produce.

Table 3.1. Financing of scientific and technical projects according to fields of activity

Type of strategic behavior of innovation enterprises	General characteristics	Relevant innovation strategies	Innovations on the level of novelty
Explerent	Innovative activity is aimed at the development and production of radical innovations. They operate from the beginning of production release at pre-investment stages	Active and offensive	Radical innovations
Patient	Narrow specialization. They focus on specific areas of activity. Concentration of efforts on the products limited in demand. Production of products with unique properties which has an exclusive character and is of high quality and focuses on demanding consumers. It functions simultaneously at the stages of production release and fall of inventive activity	The strategy of finding your own niche and traditional strategy	Ordinary innovations, radical innovations are possible
Violent	Mass standard production. High quality of products, its high level of standardization, unification and manufacturability. Satisfying the needs of a wide range of consumers. Orientation to innovations which make products cheaper. More focused on partial improvements. They operate at the stage of reducing demand for products, that is, at the end of the life cycle	Passive and offensive, defensive, traditional and imitation (licensing) strategies	Ordinary and modifying innovations
Commutant	Satisfy local or even individual demands. Better fitness to meet small sized needs of specific consumers. Individualization of the use value of the goods. Use innovations created by others, enriching them with individual characteristics and adapting to the needs of specific consumers. There is a tendency to imitate. Focus on innovations, aimed at improving product quality and serving local needs. Organization of new services based on new technologies	Opportunistic (quality strategy)	Replacing innovations based on product differentiation

Based on the analysis of Table 3.1, it can be argued that innovation enterprises with different types of strategic behavior have different levels of innovative capacity. This relationship is clearly shown in Figure 3.1.

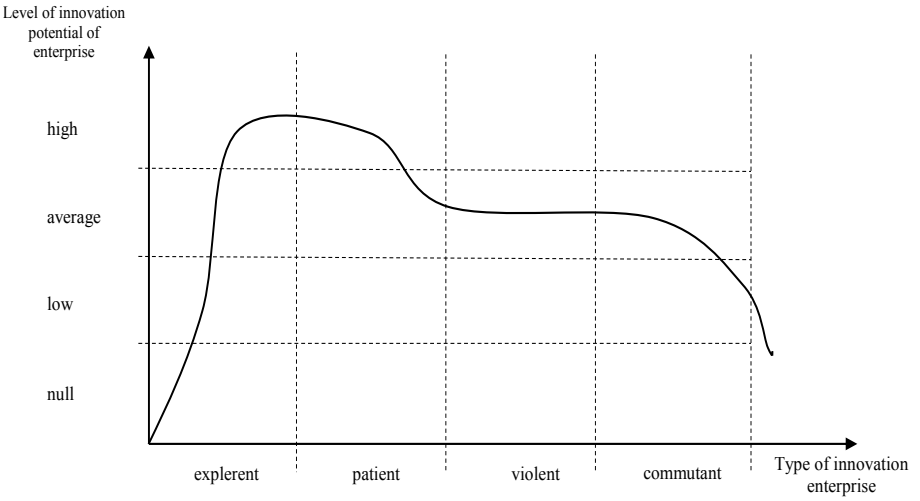

Figure 3.1. Dependence between the type of strategic behavior of innovation enterprise and the level of its innovation potential (compiled by the authors)

According to Figure 3.1, explerent companies which are leaders in the production and promotion of innovative products have the most innovative potential. They create radical innovations. The level of innovative potential of patient enterprises varies between high and average. As a rule, they create simple innovations, although they have the potential to develop the radical ones. Violent enterprises have an average innovative potential and direct their activities mainly to modifying and simple innovations. The level of innovative potential of commutant enterprises fluctuates between average and low, they focus their activities on replacing innovations oriented to a limited number of consumers (in the local market). So, we can conclude that, depending on the type of strategic behavior chosen by the enterprise, its products will differentiate.

Next, we will analyze the indicators of innovative activity of domestic industrial enterprises for the period from 2000 to 2015 (Table 3.2).

Table 3.2. The main indicators of innovative activity of industrial enterprises for 2000-2015 (compiled by the authors on the basis of [17-22])

Year	Number of industrial enterprises that sold industrial products	Proportion of enterprises involved in innovations, %, number of enterprises engaged in innovations (in brackets,)	Proportion of enterprises implemented innovations, %, number of enterprises implemented innovations (in brackets)	Proportion of enterprises, implemented innovations, %, number of enterprises implemented innovations (in brackets)	Realization of innovative types of production *, titles	New technological processes, processes	Proportion of realized innovative products in the volume of industrial, %
2000	9475	18.0 (1705)	14.8 (1491)	14.3 (1352)	15323	1403	-
2001	10293	16.5 (1697)	14.3 (1503)	12.6 (1298)	19484	1421	6.8
2002	10037	18.0 (1808)	14.6 (1506)	- (-)	22847	1142	7.0
2003*	9931	15.1 (1496)	11.5 (1120)	- (-)	7416	1482	5.6
2004	9920	13.7 (1359)	10.0 (958)	11.0 (1095)	3978	1727	5.8
2005	10047	11.9 (1193)	8.2 (810)	10.2 (1022)	3152	1808	6.5
2006	9995	11.2 (1118)	10.0 (999)	9.2 (918)	2408	1145	6.7
2007	10346	14.2 (1472)	11.5 (1186)	10.0 (1035)	2526	1419	6.7
2008	10728	13.0 (1397)	10.8 (1160)	9.3 (993)	2446	1647	5.9
2009	10995	12.8 (1411)	10.7 (1180)	9.0 (994)	2685	1893	4.8
2010	10606	13.8 (1462)	11.5 (1217)	9.1 (964)	2408	2043	3.8
2011	10350	16.2 (1679)	12.8 (1327)	10.1 (1043)	3238	2510	3.8
2012	10089	17.4 (1758)	13.6 (1371)	10.3 (1037)	3403	2188	3.3
2013	10103	16.8 (1715)	12.9 (1312)	10.2 (1031)	3138	1576	3.3
2014**	10010	16.1 (1609)	12.1 (1208)	9.0 (905)	3661	1743	2.5
2015***	4767	17.3 (824)	15.2 (723)	11.9 (570)	3136	1217	1.4

*Notes: * – until 2003 – new types of products; ** – starting from 2014 – excluding the temporarily occupied territory of the Autonomous Republic of Crimea, Sevastopol and part of ATO zone; *** – starting with the report for 2015 – legal entities of types of economic activity in industry with a working force of 50 people or more.*

As can be seen from Table 3.2, the proportion of enterprises engaged in innovative activity in the total number of them during the period under review was insignificant but did not have a steady upward trend. If in 2007 the proportion of innovatively active enterprises increased to

14.2% against 11.9% in 2005, whereas in 2008 and 2009 there was a decrease. In 2010-2012 they were characterized by an increase in the proportion of enterprises engaged in innovative activity to 13.8%, 16.2% and 17.4%, respectively. In 2013-2014 there was a gradual decrease in the proportion of innovatively active enterprises to 16.8% and 16.1%, respectively. However, despite the gradual activation of innovative activity at Ukrainian enterprises and the growth in the number of new technological processes and production of innovative products that have been introduced, the proportion of realized innovative products in the industrial volume tends to decrease from 6.7% in 2006, to 3.3% in 2012 and 2013 and to 2.5% in 2014. However, the deterioration in the indicators in 2014 can be explained by the complication of the situation in the East of Ukraine as part of the antiterrorist operation.

Figure 3.2 shows the volume of sales of innovative products by industrial enterprises of Ukraine.

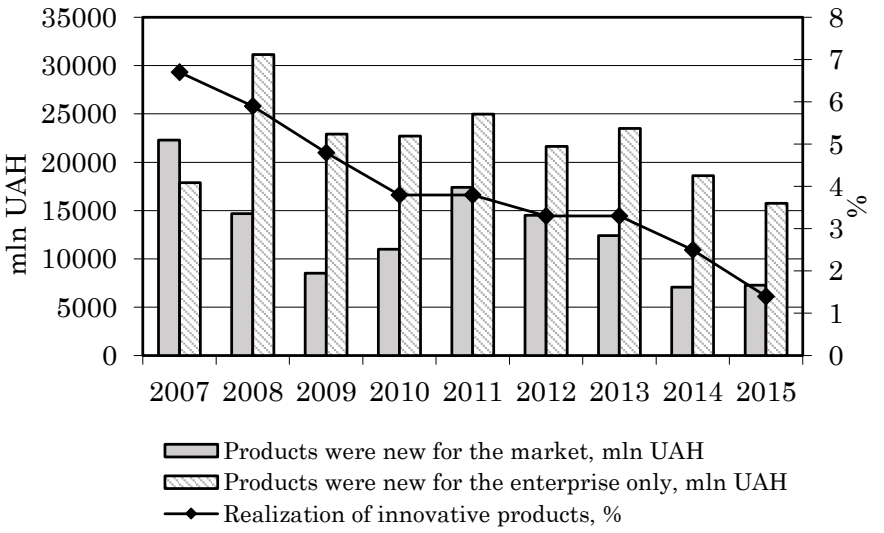

Figure 3.2. Volumes of realization of innovative products by industrial enterprises [17-21]

According to Figure 3.2, there is a tendency to decrease in the volumes of realization of innovative products on the market (by 3.4% in 2013 compared to 2007, by 4.2% in 2014 as compared to 2007) that can be explained by the lack of financial resources of enterprises and difficulties with bringing innovations to the market. Quite often enterprises are able to create innovative products, but they do not know how to bring

them to the market and interest consumers, which can be explained by the lack of marketing policy of distribution.

In addition, it should be noted that although in 2007 the proportion of enterprises with innovative products which were new to the market, predominated, since 2008 most enterprises focused on the development and implementation of innovative products that are new within the enterprise, but not for the market (in 2013 65% and 35% respectively, in 2014 – 72% and 28%, in 2015 – 68% and 32%, respectively). This is determined by the lack of funds, insufficient level of development of R&D at enterprises, incomplete market data, undeveloped system of bringing innovative products to the consumer.

If we consider the distribution of the volume of expenditures in the areas of innovation activity, then we can trace the disproportion between the directions and the amount of deposits (Figure 3.3).

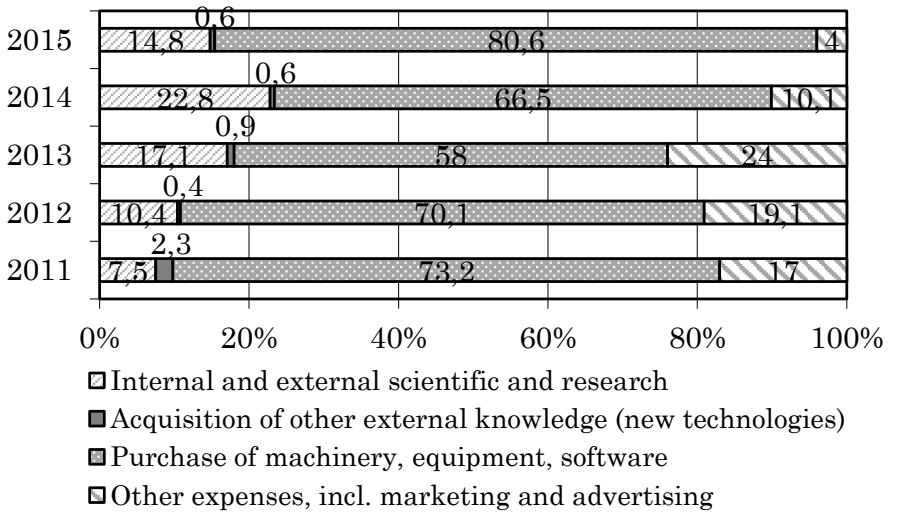

Figure 3.3. Distribution of the volume of expenditures in the areas of innovative activity [17, 21]

During all 5 years (from 2011 to 2015), a bulk of the funds is spent on the acquisition of machinery, equipment and software. To implement innovations, in 2014, 1,206 enterprises spent 7.7 bln UAH, more than two thirds of which to purchase machinery, equipment and software, 15.9% – to make research and development (R&D) by own forces, 6.9% – to purchase R&D results in other enterprises (organizations), 0.6% – to make an acquisition of other external knowledge (new technologies) and

10.1% – to educate and train personnel for the development and implementation of new or significantly improved products and processes, activity on market introduction of innovations and other works related to the creation and implementation of innovations (other costs) [23-24].

In 2015, enterprises spent 13.8 bln UAH on innovations, including 11.1 bln UAH for the purchase of machinery, equipment and software, 2 bln USD for internal and external research and development, 0.1 bln UAH for acquisition of other external knowledge (acquisition of new technologies) and 0.6 bln UAH for education and training of personnel to develop and implement new or significantly improved products and processes, market innovations and other activities related to the creation and implementation of innovations (other costs).

In addition, it should be noted that Ukrainian proportion in the world trade volume of high-tech science-intensive products is very small – it takes only 0.1%. This can be explained by the apparent type of development in Ukraine.

It is equally important to determine the proportion of innovative products exported abroad. So, the number of enterprises, implemented innovative products outside Ukraine, and their proportion in the total volume of innovative products sold are presented in Table 3.3 [25].

Table 3.3. The number of enterprises, implemented innovative products outside Ukraine, and its proportion in the total volume of innovative products sold

Year	Number of enterprises, implemented innovative products outside Ukraine, units	Proportion of innovative products sold outside Ukraine in the total volume of innovative products sold, %
2010	343	40.7
2011	378	29.8
2012	332	36.9
2013	334	44.8
2014	295	29.2
2015	213	47.0

Thus, during the analyzed period, there is a significant change in the dynamics of the proportion of innovative products sold outside Ukraine. The smallest proportion of sales was observed in 2011 and 2014.

Since 2006, the State Statistical Service of Ukraine has started to conduct surveys of innovation activities of enterprises on the methodology of the Community Innovation Survey, CIS, implemented by the EU.

In the course of four studies conducted between 2006 and 2015, Ukrainian enterprises with innovative activity were identified according to the types of innovations they were engaged in (Figure 3.4).

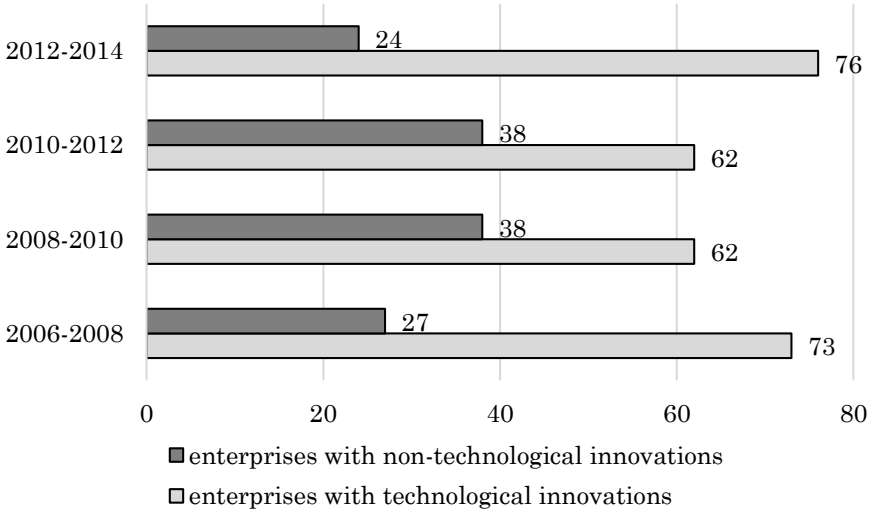

Figure 3.4. The proportion of innovative enterprises with technological and non-technological innovations in industry by survey periods, % (calculated according the State Statistical Service of Ukraine)

During four study periods the ratio of enterprises with technological and non-technological innovations remained almost unchanged. The proportion of enterprises with non-technological innovations ranged from 24 to 38%, while the proportion of enterprises with technological innovations varied from 62 to 76%.

Thus, the primary focus of Ukrainian innovative enterprises is on the introduction of technological innovations, that is, new products and new processes. Simultaneously, the proportion of marketing and organizational innovations remains insignificant.

If compared with the indicators of innovative activity of enterprises in the European Union (EU-28), during 2012-2014 49.1% of enterprises showed innovative activity. During 2010-2012 the innovative activity index was 48.9%. The greatest innovative activity was shown in Germany (67.0%), Luxembourg (65%) and Belgium (64%); the lowest in Poland (21.0%) and Romania (12.8%) [26].

If consider in the context of types of innovations, the situation in 2012-2014 will be the following: 27.3% of innovatively active enterprises were engaged in organizational innovations, 23.9% introduced product

innovations, 22.8% introduced marketing innovations and 21.6% – process innovations. Thus, we can observe that the innovatively active enterprises of EU-28 introduce different kinds of innovations almost equally [26]. Thus, it can be argued that the European Union countries focus their attention on both technological (product and process) and non-technological (marketing and organizational) innovations.

Let us consider the activity of the innovation leader of the European Union, Germany, in the implementation of non-technological innovations in more detail. In 2012-2014 the proportion of enterprises in Germany that implemented marketing and organizational innovations was about 45% of all enterprises. In 2012, 14% of enterprises introduced only marketing innovations, 13% – only organizational innovations without significant changes in marketing and 18% introduced both marketing and organizational innovations.

Table 3.4 presents the dynamics of the introduction of marketing innovations at German enterprises in 2010-2014.

Table 3.4. Distribution of enterprises and organizations in Germany for subtypes of marketing innovations (compiled based on [27])

Marketing innovations	2010-2012	2012-2014
	share in all marketing-innovators	share in all marketing-innovators
Distribution channels	58	52
Design	41	45
Pricing	32	30
Advertisement	53	53

As can be seen from Table 3.1, in 2012 and 2014 more than 30% of all German companies have presented at least one marketing innovation. In 2012 and 2014, new advertising techniques and new distribution channels were the most common types of marketing innovations, followed by a new design and new pricing. In addition, during the period under study, the positive dynamics of the introduction of new design of products at innovation enterprises was traced, the percentage of enterprises decreased somewhat, new distribution channels and pricing were introduced, the proportion of enterprises, introduced new advertising techniques, remained unchanged.

The dynamics of introduction of organizational innovations at German enterprises in 2010-2014 is presented in Table 3.5.

Table 3.5. Distribution of enterprises and organizations in Germany for subtypes of organizational innovations (compiled based on [27])

Organizational innovations	2010-2012	2012-2014
	share in all organizational-innovators	share in all organizational-innovators
External relations	37	38
Work organization	67	66
Business processes	66	59

In accordance with Table 3.2, 31% of all enterprises presented at least one organizational innovation in 2012 and 2014. Such organizational innovations as a new work organization made up the largest proportion (66% in 2014 and 67% in 2012 for all enterprises-organizational innovators, 21% in 2014 and 20% in 2012 for all enterprises), new business processes and new external relations comprised a slightly smaller proportion.

So, innovative and active German companies actively introduce non-technological innovations.

According to a study done in in Great Britain 2012-2014, 53% of enterprises showed innovative activity, including 61% of large enterprises and 53% of small and medium-sized enterprises.

At the same time, 25% of innovatively active enterprises have introduced technological (product and process) innovations. 19% (with almost a third of product innovations (32%) were new for the market), while the process innovations – 13% (more than a quarter (27%) of technological innovations were new for industry processes).

At the same time 42% of innovative and active UK companies introduced non-technological innovations. In particular, 27% of enterprises engaged in the introduction of «new business practices», 20% – in «new method of organizing work responsibilities», 16% – in «changes in marketing concept and strategies» [28].

In accordance with the above-mentioned Ukrainian innovation enterprises, it is necessary to pay attention to non-technological innovations as a basis for providing advanced innovative development [29; 30].

At present, given the current trends in the development of Ukrainian innovation activity, it is advisable to develop its traditional sectors as [1]:

- complex modernization of production with the introduction of modern achievements of domestic and world science and technology;
- the development of priority industries that will determine the main vectors of the growth of science-intensive types of engineering activities, in particular, the production of aviation and rocket and space techniques, instrument engineering, shipbuilding, manufacture of the

newest rolling stock and other equipment for railway transport, machine tool, power and agricultural machinery, production of electronic equipment and communication tools;

- the development of technological equipment for the modernization of basic industries in the direction of resource and energy conservation, greening production and increasing its overall level of efficiency.

Summarizing the above, it can be noted that in its scientific and technological and innovative development, Ukraine lags far behind the developed countries of the world. This is caused both by the lack of proper state support for the innovative activity of industrial enterprises, and by the fact that enterprises themselves are not ready for its implementation.

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3.2. Some European challenges for the Ukrainian innovation system

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The development of the national innovation system (NIS) of each country is accompanied by solving tasks and problems of varying degrees of complexity, some of which can be overcome by effective policies and management, while others remain insurmountable and pose challenges for the economy and society. The formation of balanced and productive NIS in transition economies at the stage of society's reform may become complicated by difficulties that was successfully overcame or weakened by more developed countries. Also, total corruption, political instability and poverty of the population are permanent pressure factors during Ukrainian NIS transformations, which in recent years are being supplemented by external military aggression.

On the one hand [16], innovation is about bringing better products and services to market as the first key element of the system, while the parts of knowledge creation, dissemination and technology transfer in innovation cycles [3] are no less important and have essential difficulties. Different types of non-coherent knowledge for efficient innovation process should be composed. As B.-A. Lundvall et al. noted [11], «most of the new knowledge needed for innovation did not come directly from … research and experimental development but rather from other sources like production engineers, customers, marketing, etc.». According to R. Veugelers & E. Del Rey [18, p. 2], the link between research and

innovation and between science and industry is «neither direct nor obvious», while «there is strong evidence of complementarity between publicly funded research … and private investment on R&D and corporate innovation». The more technologically complex and radical are innovations the more they should be based on excellent research and development, especially if it refers to knowledge–based economy. That's why the challenges of R&D policy and management should be a matter of great importance for studying and solving. It is essential, that deformed parts of the whole NIS should have very important meaning, because each element of the system makes the other elements more or less effective [16].

As economic and social studies show, Ukrainian NIS is in a difficult position. Traditionally, researchers of the Ukrainian NIS pay attention first of all to the most general problems of its formation and effective activity, among which: corruption, policy instability, inflation, inefficient government bureaucracy, access to financing, government instability [2, 14, 16]. According to United Nations Economic Commission for Europe [16, p. XVI]: «Ukraine has adopted many innovation initiatives in the past. However, implementation has been uneven, due to the lack of necessary follow-up steps to give concrete expression to high-level objectives, including the provision of financial resources. The lack of engagement of key innovation actors in the design process has also undermined implementation. In addition, no systematic evidence has been collected on the innovation impact of past programmes to assess performance».

Innovation performance assessment, used by the European Innovation Scoreboard 2017 (EIS-2017) [8], shows, that Innovation index of Ukrainian NIS in 2016 is lowest among 28 EU and 8 neighbouring countries.

According to the source [8], the «Attractive research systems» dimension of the Ukrainian NIS Innovation index is the lowest among 28 EU and 8 non-EU countries. This dimension of the EIS-2017 Innovation index consists of elements: international scientific co-publications (per million population) according to Web of Science 2016, scientific publications among the top 10% most cited publications worldwide (share of total scientific publications of the country, Web of Science 2014) [8, p. 28], and the «Foreign doctorate students» indicator [8, p. 9].

The Important events for Ukrainian NIS assessment were the studies and propositions worked out by the independent panel of Horizon 2020 Policy Support Facility (PSF) [9]. The PSF panel defined thirty recommendations and seven policy messages to the Ukrainian government. As noted [9, p. 9]: «R&D in Ukraine should be based on «excellence» in terms of academic world-class science and on «excellent science for innovation». According to K. Schuch et al. [13, p. 5]: «… one can observe a low share and negative trend of Ukraine's most cited publications worldwide as %

of total scientific publications of Ukraine, a very low level of public-private publications and a rather low but steadily increasing level in international scientific co-publications».

Table 3.6. Innovation indicators and the place of Ukraine among European countries according to EIS-2017 [8]

	Ukraine, index/place	Romania, index	Bulgaria, index	Poland, index	Turkey, index
Innovation Index	0.142 /38	0.167	0.234	0.270	0.294
Human resources	0.263 /33	0.198	0.286	0.308	0.182
Research systems	0.060 /38	0.121	0.116	0.133	0.110
Friendly environment	n/a	0.390	0.289	0.364	0.482
Finance and support	0.108 /35	0.102	0.091	0.289	0.395
Firm investments	0.195 /36	0.050	0.247	0.356	0.594
Innovators	0.088 /33	0.000	0.064	0.012	0.468
Linkages	0.023 /38	0.148	0.089	0.134	0.316
Intellectual assets	0.116 /35	0.122	0.487	0.383	0.106
Employment impacts	0.419 /25	0.199	0.526	0.473	0.052
Sales impacts	0.214 /37	0.401	0.216	0.356	0.308

Some innovation challenges, in particular as to R&D performance, are simple to note, but difficult to explain due to interconnection of factors. For example, D. Castellani et al. [6] found evidence of a positive and significant impact of the R&D performance into productivity, and that US firms have a higher capacity to translate R&D into productivity gains, than EU firms, but they paper leaves open questions why. We think, Ukrainian R&D problems among innovation challenges can be actual object for our study in order to define, why and how they are possible and what are they origin.

Why we should talk about R&D excellence and performance not as about solving evolutional incremental development tasks, but as about problems and challenges for the Ukrainian NIS? Because there are negative R&D management aspects, which not only exist in scientific community activities, but corresponds to the legislation and to aims and values of Ukrainian science, which were deformed. Although the PSF panel of Horizon 2020 [9] recommended to transform R&D activity on scientific excellence and performance for innovations using recently changed the Law of Ukraine «On scientific and scientific-technical activity» [1] (LoSSTA), our study will show, that existing legislation does not promote high standards of scientific excellence.

We can show, that some regulations of the LoSSTA far from the needs to reform R&D. This law defines «a scientist» and «a scientific worker» as the main subjects of scientific and scientific-technical activities, where the scientist carries out fundamental and/or applied scientific research and obtains scientific and/or scientific-technical results. Emphasis on performance is important, but the scientist could obtain results only «in principle», and there are no other clarifications regarding the quality of ones. According to the Article 6 of the LoSSTA [1], a scientific worker has the obligations to conduct R&D according to agreements or contracts, to publish results etc., but he or she has no direct obligations to obtain R&D results and as regards to their quality.

It is clear, that if the aims, principles, requirements and tasks of R&D policy are defined in a certain legislative document, they should lead to results quality, excellence and performance and should be a base for effective management. According to the Article 2 [1], the purposes of the Law include «creation of conditions to improve the efficiency of research» only as general declaration without propositions, how and what conditions could be created. The State should provide conditions for the development and effective use of scientific potential, and among the objectives of public policy is to achieve «a high level of science and technique development» (Article 45) [1]. But there were no directly defined principles and tasks of the State policy (Articles 2, 45, 46) to ensure high quality results of R&D, their excellence and performance.

Our previous studies suggest [4], that in a country with socioeconomic deformations could arose situations in which access to funding and preferences don't strongly connected with scientific and educational excellence or performance. Individuals always search an optimal and a simple way to obtain maximal salary. According to the LoSSTA [1] and our studies [4] of the Law «On Higher Education» and the Government resolutions, for scientists often is more optimal to obtain scientific degrees of a Candidate of Science (PhD) and a Doctor of Science and academic titles, which are not always an equivalent to creation of high quality scientific knowledge in Ukrainian realities. There are essential needs of the «degrees» and «titles» for scientific-pedagogical workers in order to obtain license on education activity, especially to prepare graduate students.

So, the first Ukrainian NIS challenge in the R&D dimension *is the research excellence problem (RE challenge)*, which appears because of the fact that it is possible to obtain an academic position and resources, salary, without the constant creation of excellent scientific knowledge, and this is allowable by legislation, policy and management. The main problem of R&D excellence is that the subsystem of organization and evaluation of research of the Ukrainian NIS proved unable to create and use

methods and means of separating qualitative scientific results from mediocre and low ones.

The next challenge could be defined *as the problem of research excellence for innovations (REI challenge)*.

In order to show the level of knowledge-based cooperation between academic and business R&D, PSF panel [9, 13] used the bilbiometric indicator of public-private co-publications by million populations. If the EU average for 2008-2014 fluctuates between 33.9 and 41.6, the Ukrainian series data lies between 0.9 and 1.5 [9, p. 35].

Table 3.7. The University staff in 2015 and the R&D funding by grants and contracts [4]

University	Teaching staff and researchers	R&D grants and industry contracts, th. UAH*	R&D grants and contracts per scientist, €
Taras Shevchenko national university of Kyiv	3266	3123	39.6
National technical univ. of Ukraine «Igor Sikorsky Kyiv polytechnic institute»	2622	12324	193.9
Lviv Polytechnic national university	2100	7266	142.7
Ivan Franko national university of Lviv	1962	2762	58.2
V.N. Karazin Kharkiv national university	1826	4101	92.8
National technical university «Kharkov polytechnic institute»	1919	1877	40.4
Odessa I.I. Mechnikov national university	1500	2064	56.9
Oles Honchar Dnipro national university	1397	1438	42.9
Sumy state university	771	8781	469.9

* *thousand UAH*

Our studies [4] give reason to believe that today for Ukrainian universities the most significant indicator of research excellence for innovations are the R&D funding obtained from industry and entrepreneurship, foreign and domestic grants. The results, presented in Table 3.7, of the leading universities of Ukraine for R&D at the expense of customers are quite low, but indicators of economic and pedagogical institutions are even lower.

According to our study [4], ten Ukrainian Economic Universities in 2015 had a total of 4290 staff lecturers and researchers and received 171 160 UAH by R&D contracts with industry and grants, an average of 399 UAH or only 16 euros per scientist throughout the year. So, there exist the problem of R&D performance usefulness for industry and

entrepreneurship, and this is the challenge for entering of Ukraine into the European research an education area. What does the problem look like in the goals and values dimensions that determine the activity of scientists in Ukraine as the country with weak economy and society «in transition»?

A limited industry request to R&D results in the country stimulates they decline. Scientists are looking for opportunities to get results as such that will be well enough and stably paid. To a sufficient degree – it's abroad, in more prosperous countries. Scientific results could be stably paid in educational activity at the university. But for to be used the frontier research knowledge often requires a reflexive methodological reconstruction. Such transformation helps to systematize knowledge, make one more coherent with existed theory systems, possibly, expand objects of cognition as an alternative to constant search and deepening ones in the narrow direction. But this also leads the scientist activity from frontier research to secondary knowledge processing for educational explanations.

The challenge of *research excellence for innovations* lies in the fact that the scientists who have long been oriented either to cooperation with foreign partners or to teaching at universities should be redirected to work with Ukrainian industry and entrepreneurship. In part, this may be organizational-methodological reorientation of scientists, the change of R&D rules, and partly – the revival of the industry order, the restoration of value «utility» and its materialization in remuneration.

As PSF panel noted [9], Science in Ukraine should be radically changed, and R&D should be based not only on excellent science, but also on «excellent science for innovation». Among the barriers the PSF panel is defined [9, p. 14]: lack of incentives for public research organizations to engage in innovation activities; lack of entrepreneurial and innovative culture; insufficient interest in R&D activities of economic actors; lack of awareness and ability of SMEs to innovate; absence of effective channels to convey information between industry, science and education. According to PSF panel [9, p. 63], the introduction of three specific innovation support instruments is suggested: innovation vouchers, science-industry mobility schemes, and collaborative projects between public research organizations and industry. A very useful proposal is to change the employment contracts for researchers in public organizations in order to integrate the commercialization aspects into their research [9, p. 64].

Ukrainian innovation policy more deals with the rough effects of the gap between R&D and industry, and therefore does not pay much attention to epistemological subtleties of the modern knowledge productions [12]. The LoSSTA used the concepts of fundamental and applied

research and experimental development according to the well-known «linear model», while modern scientific communities and R&D managers are looking for the ways to bridge the gap between research and application, between science and economics [4]. For example, in [10] there is proposed «a distinction between science-driven research and innovation-driven research». The last one should be oriented to solve problems, use the relevance for sector or region as quality criteria, and do transdisciplinary and translational research with close interactions [10, p. 19].

As noted C. Blümel et al [5], translational research (TR) has become an intensely debated in biomedicine. The aim of TR is to support an efficient translation from laboratory research into practice and vice versa, but the notions show some common features. TR proposed solutions to overcome either the innovation or the implementation gap and they need adequate policies and regulations on various levels from research and industry to politics.

It should be noted that today is not only a science «in the strict sense» needs legislative stimulation. Concept of «Mode 2» knowledge production defined in publications of H. Nowotny, P. Scott and M. Gibbons [12] is not epistemologically sound but very useful in the aspects of «social robustness» and as a cooperation of society for common responsibility, and as a tool for «research in context of application», which join more closely research with innovation. The concept of «Mode 2» is also leads the R&D from ideals to obtain truth and objectivity in Science to solving problems in wide world of Practice, in some sense, from excellence to performance.

In world practice one of the main means to increase the productivity of R&D for innovations is to stimulate entrepreneurial activity of scientists, in particular to support the transformation of research groups into firms. According to H. Etzkowitz, the transfer of technology has been accepted as an administrative function of research universities [7, p. 115]. The first phase is to provide R&D for innovation, where the research groups act as «quasi-firms», as nascent entrepreneurial structures, the second phase refers to the translation of the R&D results into economic goods [7, p. 119].

However, in our opinion, achieving R&D excellence for innovation can for a long time remains the challenge for the Ukrainian NIS, even with the use of modern incentives, including recommendations of the PSF panel [9], because it is very difficult to shift industry to innovations, and to turn the scientists from orientation to work abroad and teaching at universities.

Studies of Ukrainian [4] and foreign experts [9, 13] indicate that R&D funding, research infrastructure facilities and salaries paid to researchers in the country is insufficient and does not meet the legal norms and this may by defined as a challenge for innovation policy. According to

UNESCO statistics [17], Ukrainian GERD '000 in current PPP$ was 2 100 862.10. Table 3.8 show the comparison of Ukrainian data with other countries according to the calculation of the number of researchers in a full time equivalent (FTE), and Scopus data in the calculations per researcher.

Table 3.8. The University staff in 2015 and the R&D funding by grants and contracts [4]

	Ukraine	Romania	Bulgaria	Poland	Turkey
Researchers in FTE	43016.1	17459	14224	82594.3	89657.26*
GERD per researcher, FTE ('000 in current PPP$)	48.84	122.48	88.09	124.08	171.07*
Publications in Scopus per researcher, FTE	0.24	0.84	0.28	0.50	0.48
Citations in Scopus per researcher, FTE	0.46	1.72	0.90	1.39	1.00

**in 2014*

There is a combination of the problems of inadequate R&D funding and the number of active and productive researchers required for the Ukrainian NIS. At the same time, in the context of European integration activities of Ukraine, a challenge is also the low number of publications and their citations in Scopus and Web of Science. It should be noted that Ukrainian researchers still traditionally continue to publish their results in domestic journals which mostly not indexed in the leading international databases. So, the very low performance of Ukrainian researchers in line with the standards adopted in European countries is a challenge in the context of European integration.

It should be noted that the Ukrainian NIS has significant scientific, technological and innovative potential in such fields as Materials science, Energy and Computer Science. It also retains the potential and effectiveness in such branches of science as Mathematics, Physics and Astronomy, Chemistry that confirms by the Scopus data [15] and international studies [13]. But the situation demands quick and complex reaction on the challenges for Ukrainian NIS and its R&D subsystem by the policy and management measures.

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3.3. Risks and threats on the development of foreign economic activity in globalization conditions

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In 2016 Ukraine, according to the State Statistics Service, carried out foreign trade operations with partners from 226 countries of the world. Given that there are 193 members of the United Nations, it can be argued that Ukraine's participation in foreign economic relations is more than sufficiently large. The country's participation in export-import operations is calculated from multibillion-dollar sales to a minimum of $100, which is accounted for in official statistical reporting. As for very small «orders», for example, $100 was sold: Uzbekistan and Estonia – two units of watches of the Ukrainian brand, Austria – threads, Andorra and Ireland – canned vegetables, Kyrgyzstan – leather goods and Greece – caps. Aborigines of the Cayman Islands were sold for $100 of alcohol and $100 honey. The smallest import is for $100 goods in the ports of the island of Maine (souvenirs, hygiene items), for the same amount – articles made of ferrous metal (nails, etc.) [1].

The purpose of our study is to identify the characteristic features, trends, patterns in bilateral and multilateral trade relations of Ukraine with foreign partners. On this basis, we can talk about the long-term nature of the strategy of the state foreign trade policy, of course, taking into account the risks and uncertainties both within the country and at the global level.

To achieve this goal, we have identified the need for solving the following tasks:

- analyze the essential characteristics of globalization processes;
- characterize the political and economic challenges of global development for Ukraine during the years of independence (1991-2017);
- to investigate changes in the commodity and geographical structure of Ukraine's exports and imports in conjunction with changes in the structure of GDP;
- to study the competitive advantages, as well as risks and threats in the implementation of the state's export policy, import substitution, taking into account the reorientation of the activities of the CIS market to the markets of the EU and other regions;
- to put forward proposals on perspective directions of development of foreign economic relations of Ukraine taking into account the influence on them of global problems of the world economy.

Essential characteristics of globalization processes in the world economy. The globalization model of international economic relations is in a

continuous transformation process. It is quite understandable that the majority of the world's planet's desire to see the world is not in a state of chaos or controlled chaos, unpredictability through individual policy-makers, and to be sure that the globalization system is turning into a new, more integrated, higher level of orderliness.

The worrying phenomena associated with the manifestations of terrorism, bloody conflicts during «colorful» revolutions, military actions in the east of Ukraine and in Syria, «Brexit», nuclear tests in the DPRK, riots in Venezuela, election campaigns in the United States, Britain, France, Germany and their consequences, etc. In this situation, the tasks of each state should be reduced to the ability to benefit from the processes of globalization, to put above all the national interests aimed at improving the quality of life of all segments of the population. Ukraine must act on the basis of the interests of every citizen, nation as a whole.

From globalization to win, above all, «the strongest of this world», that is, powerful, highly developed states. In the case of developing countries, they are hardly involved in such processes as post-industrialization, integration or trans-nationalization. At the same time, they are included in the process of globalization of world markets and are largely focused on external markets: services, goods, labor (active export), knowledge (import) and capital (receiving assistance) [2].

For a deeper understanding of the laws of the development of globalization processes, it is important to understand their origins, root causes, periodicity, factors, advantages and disadvantages, problems, risks and threats to restrain, reduce the negative effects of these processes and increase the positive effects. Globalization issues became the subject of increased attention from researchers especially in the second half of the twentieth century. Globalization of the world economy is expressed in its transformation into a single economic zone, open to the unimpeded movement of goods, services, information and capital. At the same time, globalization processes are not limited to the sphere of the economy. They have a significant impact on all key spheres of society – ideology, politics and culture.

In the historical plan distinguish several stages of the formation and development of globalization [3]. At the initial stage (XIV century – the end of the XIX century), the first elements of the globalization process of the world economy, which are associated with the emergence of the world commodity market and world trade, are formed. At the second stage (the end of the XIX century – the beginning of the XX century), the fundamental foundations of the international division of labor, as well as the future globalization of world trade, are laid. The transition of initial capitalism to the stage of monopolization of production is being carried out.

There is a section of the world's territory and areas of economic influence between the leading powers, increasing cross-border flows of capital.

The third stage on the path to global globalization (1914-1939) is associated with the period between two world wars. It is characterized by destructive actions in existing international economic ties. The financial system at the transnational level is extremely volatile and unstable. From industrialized countries there is long-term capital, the process of division of labor is intensifying; the first international corporations are formed. As a result of the revolutionary events in Russia (October 1917), the world is divided into two opposite systems of economic development – capitalist and socialist.

The fourth stage (the end of the Second World War – the beginning of the 90's of the twentieth century) is characterized by the establishment of new economic relations between the states. The main influence on the international economy is provided by the liberalization of foreign trade policy, the growth of labor productivity, accelerating progress in the field of science and technology, the rapid pace of growth of the world economy. The basis of the globalization of world finances is laid, the macro-system that regulates world economic development through the organization of political, financial and economic orientation (UN, IMF, MB, IBRD and WTO) is being built. The colonial system, which regulates the interaction of metropolises with colonies, collapses.

The fifth stage of the development of the world economy (from the early 90's of the twentieth century.) is connected, first of all, with the collapse of the socialist economic system. Post-socialist countries are moving to the markets of a market economy, the process of their accession to the WTO is being implemented. The development of the world economy is characterized by a number of features: the liberalization of foreign economic relations; Tran nationalization of capital and production; regional economic integration; internationalization of economic life; unification of rules of economic life, creation of a system of interstate regulation of world economic relations; manifestation of protectionist sentiment. The contradictions between the sovereignty of many countries and the policy of globalization are sharpening. The effectiveness of using traditional macroeconomic instruments at the national level (export subsidies and import barriers, central bank refinancing rates and the national currency rate) is decreasing [2, 4].

Globalization processes in the global economy have both positive and negative sides [5]. The advantages of transforming the world economy into a single system include:

- international competition intensifies, from which, in the first place, the leading world economies;

- there is an increase in labor productivity as a result of rationalization of production, introduction of innovations and dissemination of advanced technologies;
- the development of cooperative ties is associated with economies of scale in production, which leads to a significant reduction in costs and prices;
- in mutually beneficial international trade, all subjects of market relations (individuals, companies, countries, trade unions, continents) are interested;
- developing countries have opportunities to increase their economic potential by increasing participation in the international division of labor.

Globalization, as an economic phenomenon, was initially planted and continued to be used by developed countries with a powerful economy of the rest of the countries with a rather low level of technological development, with a low standard of living. The first part of the countries or countries of the «golden billion» (slightly more than three dozen) successfully trade with each other on a mutually beneficial, innovative basis, preserves a high level of consumption for its citizens. In relation to more than 200 developing countries, they are pursuing a policy of maximizing the use of the latter as a raw material appendage, dumping of harmful waste, humiliating «second hand».

You can also point out a number of negative aspects that reflect the process of globalization:

- in many countries, the whole industry, hundreds and thousands of enterprises are being destroyed, the process of economic deindustrialization is under way, traditional markets for the sale of goods are lost;
- hundreds of professions, highly skilled personnel, or people who fill the ranks of the unemployed or are looking for work outside the country become unnecessary;
- departments are closed in technical universities, because there is no demand for engineers – creators of innovations and innovations;
- there is a decline in fertility, a decrease in the population;
- the gap between developed and developing countries between the poor and the rich increases (the decoupling rate of income inequality);
- tensions in the world are increasing due to the incorrect use of ecosystems in the struggle for resources.

The processes of globalization, in our opinion, should be considered from the standpoint of dialectics. The world as a whole, and the system of globalization, in particular, develops, including the law of unity and struggle of opposites. There are no such phenomena that would be outside the process of infinite development, the process of occurrence within each integrity of opposite moments, their transformation into each other,

beyond the contradictory relations between them. The law of unity and struggle of opposites removes the illusion of the ultimate of any limited form of existence in nature and society. This law focuses on the disclosure of the transitive nature of such forms, their transition to higher, qualitatively new and developed forms as they exhaust their capabilities [6, 7].

Political and economic challenges of globalization for Ukraine. Since 1991 Ukraine is at the epicenter of the events taking place in the globalized world. Her political and economic history began on August 24, 1991. During the 26 years of independence (1991-2017), the country went through a difficult path – from hyperinflation and total poverty of the 90's of the twentieth century to break economic relations with the Russian Federation and the acute need to finance their own army and navy.

By the degree of readiness for economic independence from the USSR, Ukraine in 1991clearly outpaced other republics of the union state. The experts then assessed the main components of the economic potential of Ukraine on a 10-point scale in the following way: industry – 9, agriculture – 10, raw stock – 8, market opportunities – 3, overall readiness – 7.5. The economic potential of Ukraine was assigned by experts to the 10th place in the world ranking. The idea of obtaining independence in 1991 was supported by the majority of Ukrainian citizens. At the same time, from the first days of independence, its economy began to degrade. It was important to manage the accumulated labor of millions of rich heritages, to reorient the economy from the planned system of management to the market rails, to consolidate it in the traditional markets and to develop new ones.

Due to the collapse of domestic production in the first nine years of independence (1991-1999), GDP declined to 40.8% compared with 1990 levels. The crisis reached its peak in 1994: GDP fell by 22.94%. And only in 1999 began a gradual recovery of the economy. In 2008 GDP was 74.2% of the GDP of the UkrSSR in 1990 and this is the maximum figure for years of independence. However, the crisis of 2008-2009 again rejected Ukraine five years ago. GDP per capita was the lowest among the former Soviet republics. 2009 becoming crisis: GDP declined by 14.8%. Economic results of Ukraine in 2010-2013 were more than modest. 2013-2014 associated with the «Revolution of Dignity». The year 2015 ended in Ukraine with a nominal GDP per capita of $2,110 (in the 2009 crisis – $2,550).

If you analyze the data in the Table 3.9 in relation to the production of the main types of products during 1990-2016, it is easy to conclude that the country's economy has significantly lost its power in many positions. This concern, above all, the industrial sphere.

Table 3.9. Production of main types of products in Ukraine, 1990-2016

Indicators	1990	2000	2010	2013	2015	2016	2016/ 1990, %
Electricity, billion kW. a year	298	171	189	194	163,7	164,6	55,2
Coal, million tons	130	62,4	55	64,2	30,2	31,6	24,3
Ready-made rolling, million tons	38,6	22,6	17,6	17,8	12,1	13,3	34,5
Steel pipes, million tons	6,5	1,7	2,0	1,8	1,0	1,0	15,4
Ammonia compound, million tons	4,9	4,4	1,2	4,2	2,2	1,7	34,7
Min fertilizers, million tons	4,8	2,3	2,3	-	4,5	4,0	83,3
Cement, million tons	22,7	5,3	9,5	9,2	8,5	9,0	39,7
Cars, thousand pcs.	196	31,9	83,3	45,8	8,3	5,3	2,7
Fabrics, mln. sq. m.	1210	66,7	88,2	93,6	86,3	91,0	7,5
Shoes, million pairs	196	13,5	25,7	30,5	23,6	24,1	12,3
Sausage products, thousand tons	900	175	281	294	236	239	26,6
Butter, thousand tons	444	135	79,5	94,3	102	103	23,2
Oil, thousand tons	1070	973	3030	3403	3716	4412	412,3

Calculated by the author according to the State Statistics Committee of Ukraine, other available sources

According to the World Bank, Ukraine is on the list of countries on GDP growth (PPP) in percentage terms for the period 1990-2015 at the last, 191st place. Moreover, Ukraine is the only country in the world ranking, which has a negative result: minus 3% (!?). In other words, the process of creating a national product, the process of creativity is in an improper level in the country.

Achievements and problems in the implementation of foreign economic policy. Data Table 3.10 indicates that during 1996-2017, Ukraine's foreign-economic activity as a whole is characterized by relatively stable growth. Significant recession occurred in 2013 when, in connection with military actions in the east, the political and, of course, trade and economic relations of Ukraine with Russia, CIS countries sharply deteriorated.

On January 1, 2016, the economic part of the Association Agreement between Ukraine and the EU entered into force. In this situation, Ukraine had to expand its influence on the EU markets. According to the results of 2016 Ukrainian exports amounted to $36.36 billion (-4.6%), imports were $39.25 billion (+4.6%). The trade surplus was $2.89 billion. In 2016, agricultural and food industry enterprises ($15.2 billion or 42%), metallurgy ($8.3 billion or 23%) and machinery ($4.2 billion or 12%) were the main exporters of goods.

Table 3.10. Ukraine's foreign trade in goods and services, 1996-2017, $billion

Indices	1996	2000	2005	2010	2012	2013	2014	2015	2016	2017
Turnover	37,96	33,17	79,50	129,38	173,70	158,17	123,90	75,64	89,44	24,79
Export	19,15	18,06	40,42	63,19	82,34	74,83	63,89	38,12	44,89	12,45
Imports	18,81	15,11	39,08	66,19	91,36	83.34	60,01	37,52	44,55	12,34
Balance	0,34	2,95	1,34	-3,00	-9,02	-8,51	3,88	0,60	0,34	0,11

Written by the author according to the State Statistics Committee. Data for 2017 submitted on the results of I quarter

The EU share in Ukraine's foreign trade has increased from 26.5% in 2013 to 37.0% in 2016 during the same period of time, the share of CIS countries decreased from 34.8% to 16.6%. During 2013-2016 the total volume of exports in the European direction decreased by 17.0%. Exports to CIS countries for the analyzed period fell by 73.0%, in Russia by 76.0%. It is important that Ukraine does not move to the agrarian and raw material appendage of the EU.

Co-operative ties with the EU, other countries in the processing industry, and high technologies need to be strengthened. The reorientation of export supplies mainly from the markets of Russia, the CIS to the markets of the EU and other directions (South-East Asia, Africa, etc.) requires new approaches to the development and implementation of a strategic program for qualitative improvement both commodity and geographic structure. For the development of new markets, it takes time and hard work to revise many of the provisions of the law, improve marketing activities, logistics, etc.

Ukraine is interested in expanding its influence on the world market, as it has the most favorable effect on the country's economic development. In order to establish economic relations with business foreign partners in the first place, it is necessary to clearly define in the system the goals of such cooperation. Only after identifying the expected results of mutually beneficial cooperation is the choice of methods or ways to achieve the goals. In any case, in the formation of intentions to enter a certain segment of the market should take careful collection of business information, information about potential partners, competitors and their capabilities, analysis of price dynamics, to specify the mechanisms and forms of cooperation [8, p. 141-149].

Prospects for the development of Ukrainian entrepreneur's markets should be evaluated according to a certain scale of indicators, which should include market volume, growth prospects, cost of doing business,

level of competition and degree of risk. The main indicators that can determine the potential of the target market include:

- political characteristics (political structure in the country, political philosophy of the government, the government's relation to foreign business, forms and methods of stimulating private business and foreign investors);
- demographic characteristics (population size and population growth, urbanization level, population density, age structure and composition of population, family size, stage of family life cycle);
- geographical features (continent, size of the country, topographical characteristics, climatic conditions);
- economic indicators (per capita GNP share, income distribution, GDP growth rate, investment volume ratio, and GNP);
- technological indicators (technological skills level, prevailing technology of production, engineering training);
- socio-cultural indicators (social values, lifestyle, national composition of the population, linguistic diversity, attitude to religion);
- national goals (priorities of industrial and agrarian development, plans for infrastructure development) [9, p. 144-147].

On the basis of the analysis carried out, the advantage is given to the market segment, which has a high demand, high consumption rates and high profit margins, moderate competition, real requirements for pricing and marketing policies, can provide maximum benefits in the long run, including the investment of relevant investments.

Marketing risks in the development of new markets. The development of new markets is necessarily accompanied by a manifestation of marketing risks that arise from the following reasons: the wrong choice of markets for the sale of goods and services; biased assessment of potential market capacity; incorrect definition of target consumer segments; insufficient analysis of consumer needs; lack of thought, lack of or lack of distribution network in the foreseeable markets.

On the way of more extensive foreign trade development, there are a number of obstacles, namely: the continuation of hostilities in the east and the aggravation of problems in trade, economic and political relations with Russia; irrational structure of domestic exports; low competitiveness of Ukrainian goods; fluctuations of world currencies and commodity prices; instability of the exchange rate of the national currency; unfavorable conditions on the key markets for Ukraine in Ukraine, etc.

In the current context of the implementation of export-import operations, it is necessary to take into account the existence of a number of potential threats to the global economy and trade, including threats to national security and terrorism; cyber security and pandemics;

geopolitical uncertainty and instability; economic crises, recession or periods of slow growth for a number of countries and regions; turning countries into protectionism (England, USA), regulatory requirements at the level of national economies and individual industries.

It is worrying that during 2014-2016 in Ukraine, the most important spheres that reflect the qualitative characteristics of the index of the favorableness of the national environment for the development of foreign trade remain problematic: access to the domestic market and the complexity of access to external markets; efficiency and transparency of border management (customs); accessibility and quality of transport infrastructure, transport services; availability and use of ICT; operating environment (business climate).

According to the World Bank, Ukraine has worsened its export position in terms of all components of the efficiency and logistics index, namely: customs, infrastructure, international transportation, the quality and capabilities of the logistics system, tracking of goods movements and the timeliness of delivery of goods to the destination.

Perspective directions of development of the world economy. An analysis of the trends in the development of trade and economic cooperation between Ukraine and other countries indicates that it cannot be carried out outside the global context, beyond the processes of globalization. It is important to focus on the fundamental factors that will determine the dynamics and structure of exports and imports.

In the long term, the state of world trade will be shaped by the following technological changes:

- the evolution of industrial production: digital innovation, aimed at new opportunities diversified approach to different categories of consumers, new markets, strengthening the imperative of environmentally sustainable growth;
- application of inverse innovations and mass personalization of goods and services;
- the rise of micro-TNCs that is, the implementation of the digital revolution and the formation of stable and interrelated global production and commercial ties;
- improvement of logistics by reducing the cost of moving goods from the place of production to the place of consumption and increase in the speed of goods;
- continuation of the process of liberalization of trade.

Thus, as I. Burakovsky emphasizes, there are two trends: the further increase in the number and complexity of regional free trade agreements and the harmonization of standards, technical requirements, or in the broad sense of regulatory procedures. Particular attention is paid to the

stability of the political, regulatory and monetary financial environment of the production and commercial activity of economic agents [10].

After Ukraine gained independence, a number of political and economic problems arose. The quality of life in Ukraine is lower compared to other European countries. Ukraine should constructively build its relations with the EU on the path of European integration. The developed economy allows successful export policy and import substitution policy not based on cheap raw materials, but on the basis of production of innovative products. In order to strengthen its participation in the processes of globalization, in the international division of labor it is necessary to strengthen the position on traditional markets and expand the sphere of influence in new markets. When developing new markets, it is necessary to take into account the manifestation of various kinds of interference, risks and potential threats to minimize possible losses for foreign economic entities. Particular attention should be paid to foreign trade with neighboring countries, with traditional partners, as well as to actively develop new markets. The strengthening of export potential should be facilitated by a system of protectionist measures of organizational, legal, financial, marketing, technological orientation on the part of the state.

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3.4. The perspectives of IT-industry development in Ukraine on the basis of data analysis of the world economic forum

Bublyk M.I., Karpyak A.O., Rybytska O.M.

While the information, methods of its processing and transmission are becoming more important sources of value, the progressive development of information and communication infrastructure becomes a prerequisite for the economy competitiveness increase of Ukraine and its integration into the global information and cultural community. Nowadays, issues of factors and perspectives of IT industry development in Ukraine remain poorly studied. The authors foremost consider the issues of establishing interdependencies between the state of ICT development and the level of country development in general. Therefore, it is suggested to analyze the dynamics of global competitiveness indices (according to the World Economic Forum). The data obtained show that at present there are many factors that while keeping negative tendencies seriously affect the IT market development in Ukraine. Taking into account that in the modern post-industrial economy the tendencies of the ICT share increase in GDP and exports of goods and services are irreversible, an adequate state sectoral policy is of importance.

In the era of the post-industrial information society, the IT industry is one of the most important sectors of the economy. Slowing down the rate of industrial production and increasing the role of information services in the economy encourage to analyze and to study the perspectives of these processes.

Elizabeth Sparrow conducted an analysis of the conditions for the successful IT market development. The Ukrainian market of ICT

technologies as an object of foreign investment and a promising branch of the national economy is studied in the papers of L. Fedulova, L. Nozdrina, S. Voitko, R. Labzhania, O. Babanin, M. Tchaikovska, O. Chubukova, O. Kulinich, V. Yashchuk O. Polotai.

The purpose of the article is to study the state and perspectives of the domestic information technology market development taking into account the state of the Ukrainian economy on general, as reflected in the data of the World Economic Forum (Global Competitiveness Index).

Over the past decades, the world community has become the creator and the witness of the rapid entry of information technology into all areas of its activities. It is accompanied by the development of software, intellectualization of various technical means, information support for decision-making in the field of economics, politics, sociology, medicine, etc. The development of IT industry in the country is a pledge of high-tech and well-paid work for its citizens and generations to come; strong and irreversible integration into the world economy, the possibility of improving the living conditions in virtually all directions from online services to e-government, smart cars, houses and cities [1].

The past century clearly demonstrated the key role of such principles as the free market and the openness of the domestic economy to the world in the country's rapid economic growth. It is in the market environment that an intellectually strong and active part of the citizens of a certain state, even without any legislative, tax or other support, is able to find a niche in the diversity of spheres of possible economic activity for optimum realization of its potential. A striking example of self-organization in economic activity was the formation of an entire industry in Ukraine, namely, the industry of high technologies. The destruction of old business principles and the long and often contradictory path of democratic reform, as well as the strong intellectual and educational potential in Ukraine, led to the emergence of an IT market.

Market relations involve the development of those sectors of the economy whose products are competitive on the domestic market, and above all on the foreign market. It is the presence of demand on the foreign market, as well as the lack of direct dependence of such a business on state regulators, that contributed to the rapid development of the industry. Also, one of the reasons for the active infusion of new intellectual forces into the industry was the volatility of the national currency, the rapid spin-off declines in real incomes of citizens in other sectors of the economy and, as a consequence, the desire of workers to get honestly earned money for their work in dollar terms.

Table 3.11. Ukraine's rating in some areas (according to the Global Competitiveness Report [2-9])

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015
Global Competitiveness Index	72	82	89	82	73	84	76	79	85
1 st pillar: Institutions	115	120	134	131	132	137	130	130	129
1.02 Intellectual property protection	*	*	*	*	120	133	129	120	125
1.21 Strength of investor protection	*	*	*	*	141	100	105	95	79
2nd pillar: Infrastructure	79	78	68	71	65	68	68	69	75
3rd pillar: Macroeconomic environment	91	106	132	112	90	107	105	134	128
3.03 Inflation, annual %	*	*	*	*	107	1	75	134	136
8th pillar: Financial market development	85	106	119	116	114	117	107	121	130
8.01 Availability of financial services	*	*	*	*	113	109	102	101	112
8.06 Soundness of banks	*	*	*	*	142	143	138	140	138
Rank out of	134	133	139	142	144	148	144	140	138

*Notes: * – missing data, based on materials [6-9]*

For many objective and subjective reasons, the analysis of which is not the purpose of the proposed study and is, apparently, extremely complex, Ukraine has been continuing to lose its position in world developmental rankings in recent years. Thus, after analyzing the data of the World Economic Forum for 2011-2015 (see Table 3.11), we can conclude that Ukraine cannot rise to the first hundred of the rated countries (only 133-124 countries in the world in different years submit data for rating). A large number of significant indicators from the survey perspective remain in the downward trend (see Table 3.11).

So, Ukraine, having ranked 72 in the Global Competitiveness Index from 134 indexed countries, already in 2015 lowered its performance and ranked only 85th among 138 countries. In the category «Institutions» during the same years, Ukraine's position moved from 115 to 129. The state of affairs with the reliability of banks is catastrophic. According to the same data, Ukraine in recent years occupies the last or one of the last three positions (142 out of 144 in 2011 and 138 out of 138 in 2015). The same situation in 2014 and 2015 is observed with the inflation index: 134 (out of 140) and 136 (out of 138), respectively. The 3rd pillar index is consistently low: Macroeconomic environment: Ukraine moved from 91 positions (out of 141) to 134 positions in 2011, and slightly improved its performance in 2015 (128 out of 138).

Table 3.12. Ukraine's rating in some areas (according to the Global Competitiveness Report [2-9])

	2007	2008	2009	2010	2011	2012	2013	2014	2015
4th pillar: Health and primary education	60	68	66	74	62	62	43	45	54
4.09 Quality of primary education	*	*	*	*	44	37	40	45	51
4.10 Primary education enrollment, net %*	*	*	*	*	90	94	31	33	57
5th pillar: Higher education and training	43	46	46	51	47	43	40	34	33
5.01 Secondary education enrollment, gross %*	*	*	*	*	49	54	41	39	53
5.02 Tertiary education enrollment, gross %*	*	*	*	*	10	10	13	14	11
5.03 Quality of the education system	*	*	*	*	70	79	72	54	56
5.04 Quality of math and science education	*	*	*	*	34	28	30	38	27
5.05 Quality of management schools	*	*	*	*	117	115	88	87	93
5.06 Internet access in schools	*	*	*	*	62	70	67	44	35
5.07 Availability of research and training services	*	*	*	*	98	92	84	78	77
5.08 Extent of staff training	*	*	*	*	106	103	92	74	94
Rank out of	134	133	139	142	144	148	144	140	138

*Notes: * – missing data, based on materials [6-9]*

Significantly better, although far from desirable, is the situation with regard to indicators related to education (see Table 3.12). Ukraine's highest rating for 2015 has risen, ranking 11th, compared to all others, with only a percentage of Tertiary education enrollment. The relatively high position (27th position), with a tendency for improvement (34th position in 2011) is ranked by Ukraine in Quality of math and science education rating. However, in general, the quality of the educational system, with a tendency to improve (70 and 56 positions in 2011 and 2015, respectively), is at a rather low level. It's hard to imagine that in the center of Europe there is a country in which Internet access in schools is worse than in 34 countries of the world. True, in 2012 Internet access in schools was better in 69 countries.

Table 3.13. The most problematic factors for doing business (according to the Global Competitiveness Report [2-9])

The most problematic factors for doing business	2007	2008	2009	2010	2011	2012	2013	2014	2015
Corruption	8,80	10,3	13,9	16	14	15,5	17,8	16,6	14
Policy instability	15,40	16,5	15,6	6,6	6,2	10,1	14	10,6	13,2
Tax rates	13,40	3,9	8,4	9,3	10,5	8,4	7,7	8,1	7,3
Inflation	13,60	8,4	8,8	7,6	6,6	3,7	8	11,5	11,9
Inefficient government bureaucracy	4,60	8,2	8,8	10,3	7,9	13,4	8,8	8	11,4
Access to financing	8,50	13,5	10,8	13,6	15,3	16,7	13,9	12,2	11,2
Government instability/coups	7,00	9,8	9,5	5,1	3,4	3,5	10,5	6,4	8,2
Tax regulations	6,70	10,1	9,6	14,4	13,6	11	4,3	7,9	6,8
Foreign currency regulations Foreign currency regulations	2,10	6,5	2,8	2,8	1,8	4,2	4,1	7,1	4,5
Inadequate supply of infrastructure	*	1	1,5	2,8	3	2,2	1,7	1,8	2,7
Restrictive labor regulations	2,30	3,40	2,8	4,8	7,9	1,9	3,4	3,1	2,5
Insufficient capacity to innovate	*	*	*	*	1,6	4,1	1,8	2,3	1,6
Crime and theft	1,90	2,6	2,5	3,5	3,6	2,5	1,7	1,4	1,6
Poor work ethic in national labor force	5,70	2,5	1,8	0,8	1,9	0,6	0,6	0,9	1,5
Poor public health	3,60	1,2	2,8	1,3	1,3	1,3	1,1	1,1	1,3
Inadequately educated workforce	3,40	2,2	1,4	1,2	1,4	0,8	0,8	0,9	0,5

Notes: * *– missing data, based on materials [6-9]*

Thus, for many years the level of education of Ukrainian citizens has been significantly outpacing the level of economic development of the state. This, according to the authors, has become one of the most important factors in the rapid development of the branch of economy that was able to develop, being at least dependent on the economic and political situation; level of corruption, inefficiency of management, problems of tax regulation, etc. (see Table 3.13).

That is why, according to the authors, the development of the IT market began in Ukraine with outsourcing. And in a few years, some IT outsourcing companies based in Ukraine have grown to technological giants with offices around the world. Among these companies are Ciklum, DataArt, Infopulse, Lohika, Miratech, SoftServe. An example of rapid growth is AOG – a service IT company from Cherkasy, which attracted

about 5,000 freelance engineers in less than three years of operation. Over the past 15 years, overseas outsourcing companies such as EPAM, GlobalLogic, Luxoft have created several offices in Ukraine that are now at the positions of the main R & D hubs (centers) for these global IT service providers. All outsourcing companies employ more than 50,000 engineers (about 60% of all engineers) living in Ukraine [10].

In 2016, more than 1000 large enough IT companies are officially registered in Ukraine. Among them, as well as taking into account small enterprises, as of January 2015, according to the classification of types of economic activity in Ukraine, 8 371 IT enterprises were working. In particular, 479 were working on software publishing, 4890 were working on computer programming, consulting and related activities, 1193 companies were working on data processing, web site information placing and related activities, and web portals [11]. Ukrainian software companies offer virtually all possible software services, not limited to software development, web and mobile applications development, testing and quality testing, outsourcing of business processes, outsourcing of special teams, research and development services, IT consulting, management with IT security. Most of the major outsourcing companies in Ukraine offer a full range of solutions in various diverse industries. Smaller companies tend to focus on a few services, in particular on web design and design, mobile applications development and testing, and more [12].

With regard to total income and taxes paid to the budget, there are enough diverse data. But, according to [13], already in 2014 IT companies paid UAH 2 billion to the budget, as well as UAH 1 billion. paid by IT professional engineers (PEs). According to the World Bank, in 2014, private entrepreneurs involved in the IT sector received revenue of 18.1 billion UAH. The same source argues that the export of information and communication technology products ranked third in the amount of $5 billion in the overall ranking of Ukrainian exporters after the agrarian sector and metallurgy ($17 and $14.3 billion, respectively). By 2020, output of ICTs production is expected to be second in exports, leaving only agricultural products ahead [12].

According to data [15], shown in the following graphs, the dynamics the growth of exports of services and the export of computer services in Ukraine, as well as the dynamics of the growth of the Ukrainian IT industry market, illustrate that the share of exports of intellectual technologies in 2015 is already 25% of total exports services of Ukraine, and the increase of market growth in 2014 and 2015 in percentage terms is equal to 175% and 196% respectively. This is at the time when Ukraine

is in a war and poor conditions for doing business in almost all industries at best do not fall.

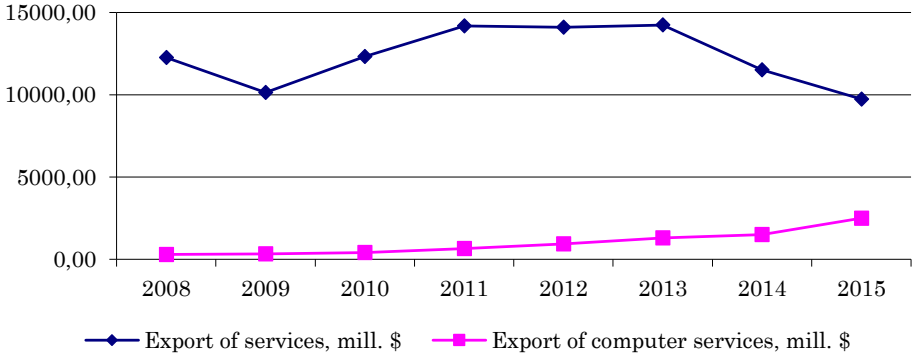

Figure 3.5. Dynamics of Ukrainian export of services and export of computer services

Thus, the percentage of exports of the computer service from the total exports of services for 8 years has increased from 2.41% to 25.68%, that is, more than in ten times (fig. 3.6).

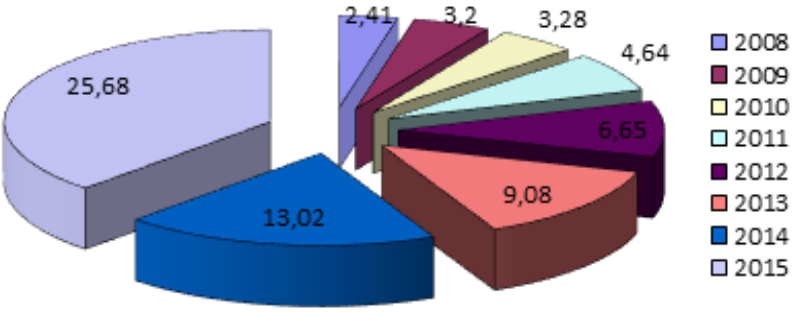

Figure 3.6. Dynamics of growth of the percentage of exports from the computer ambassador from the total exports of services

The IT industry also performs an extremely important function, namely the provision of skilled workers. The percentage of people employed in this area among the economically active working population has increased from 2014 to 2016 from 0.39% to 0.56% [11], [16] (fig. 3.7).

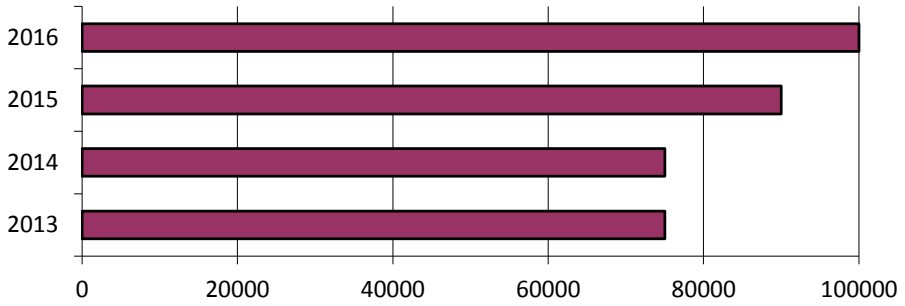

Figure 3.7. Growth of regular industry workers

The positive dynamics of growth, which today is more than 100 enterprises, is shown by R & D centers, which carry out research work. The dissemination of high-value R & D (international development and research centers) services has increased substantially, especially in recent years, in industry profits. According to the forecasts of the head of the IT Association of Ukraine, Victor Valiev, such services may account for up to 20% of Ukrainian IT exports in 5 years [14].

Ukraine is becoming more and more powerful in the global arena as a technology development center. Such international giants as Aricent, Boeing, Ericsson, Huawei, Oracle, Siemens and Teleperformance are just some of those who have chosen Ukraine as one of their R & D centers. These companies are working on innovative products in all the well-known industries, such as e-commerce, software, cloud environments, security, healthcare, finance, transportation, retailing, telecommunications, etc. Other international companies such as Cisco, HP, Microsoft, and Google do not have R & D centers in Ukraine, but they have long-term relationships with the leading software developers from Ukraine.

Experience in outsourcing has become the basis for the beginning of rapid startup development in Ukraine. Among these internationally-oriented startups there are BPMOnline, DepositPhotos, Grammarly, InvisibleCRM, Jooble, Looksery (Snapchat in September 2015), MacPaw, Paymentwall, Readdle, Starwind Software, and others. Some of them, such as Paywall and Grammarly, have grown into global companies, leaving their main R & D offices in Ukraine, that is, in the country of their creation. The range of international funds in Ukraine includes, but is not limited to, corporations such as Almaz Capital, the EBRD, Intel Capital, Horizon Capital, Naspers, and local players such as AVentures Capital and TA Ventures [15]. Beginning its activities solely from outsourcing, by 2015, the share of companies engaged in product development has grown to 28.5%, and companies – start up more than 4.5% (fig. 3.8).

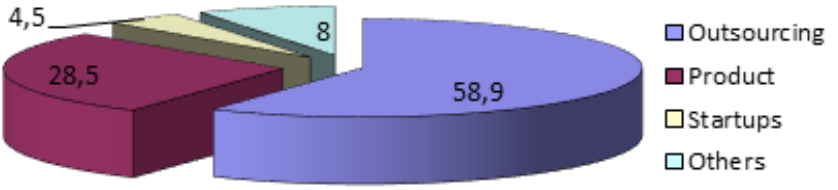

Figure 3.7. Distribution of the type of IT companies (in%) as of 2015

The level of qualifications of the employees covered by the IT industry in comparison with other leading countries is very high. This is evidenced by the following facts. Software developers accounted for more than 50% in 2015. 87% of all employees in the field have higher education, including 64% in programming or exact sciences (mathematics, physics), 10% in economics or management, and 12% in other fields (design, applied linguistics, etc.). And only 3% have a secondary or secondary special education.

An important factor in the growth of the IT industry in Ukraine is the breadth of localization of enterprises. Although 86% of all programmers work in one of five cities: Kyiv, Kharkiv, Lviv, Dnipro and Odessa, however, all regions are covered in essence. High growth rates are demonstrated by Kyiv (more than half of all programmers) and Lviv. Distribution of employees by regions is reported by [16] as of 2015.

Prospects for the development of the information technology market can also be outlined on the basis of certain indices of the Global Competitiveness Index (see Table 3.14) and other macroeconomic indicators. In terms of exports, as a percentage of GDP, Ukraine occupied the 27th position in 2015 (for comparison, in 2012 it ranked 50th in the ranking). As already mentioned above, export to Ukraine is growing at the expense of the IT technology market.

The years of outsourcing have provided IT professionals with a high level of professionalism and willingness to innovate in the Ukrainian economy. After a sharp fall in 2015, there is a rise in the rating list for such an index as «Technological readiness», in particular: «Availability of the latest technologies», «Firm-level technology absorbtion», «Individuals using the Internet». Indices such as «Capacity for innovation», «Quality of scientific research institutions», «Gov't procurement of advanced tech product» are growing. It is extremely important that the IT business has significantly changed its policy towards research development. Ukraine has risen significantly in the ratings of the indexes «Company spending on R & D» and «University-industry cooperation in R & D». For 2014-2015, Ukraine returned its five years ago positions

with the index «Availability of scientists and engineers» and ranked 29th in the rating. We are witnessing a transition in the prospects of intellectual work in Ukraine. It is the work of the IT industry that satisfies the growing need of young Ukrainian citizens in paid intellectual work. Therefore, over the past few years, (82%) the choice in favor of work in IT (82%) is so high.

Table 3.14. Ukraine's rating in some areas (according to the Global Competitiveness Report [2-9])

	2007	2008	2009	2010	2011	2012	2013	2014	2015
9th pillar: Technological readiness	65	80	83	82	81	94	85	86	85
9.01 Availability of latest technologies	*	*	*	*	80	106	113	96	93
9.02 Firm-level technology absorption	*	*	*	*	69	100	100	100	74
9.03 FDI and technology transfer	*	*	*	*	109	131	127	117	115
9.04 Individuals using Internet, %*	*	*	*	*	88	93	82	80	80
10th pillar: Market size	31	29	38	38	38	38	38	45	47
10.03 GDP (PPP$ billions)*	*	*	*	*	*	38	41	47	48
10.04 Exports as a percentage of GDP*	*	*	*	*	*	50	54	41	27
12th pillar: Innovation	52	62	63	74	71	93	81	54	52
12.01 Capacity for innovation	*	*	*	*	58	100	82	52	49
12.02 Quality of scientific research institutions	*	*	*	*	64	69	67	43	50
12.03 Company spending on R&D	*	*	*	*	104	112	66	54	68
12.04 University-industry collaboration in R&D	*	*	*	*	69	77	74	74	57
12.05 Gov't procurement of advanced tech product	*	*	*	*	97	118	123	98	82
12.06 Availability of scientists and engineers	*	*	*	*	25	46	48	29	29
12.07 PCT patents, applications/million pop.*	*	*	*	*	51	52	52	50	49
Rank out of	134	133	139	142	144	148	144	140	138

*Notes: * – missing data, based on materials [6-9]*

In 2016, 8188 questionnaires were collected, that is, every 12th specialist of IT industry of Ukraine took part in the survey. To the question «If you should not have to make money, then you would» 43% of the participants of the Internet survey among IT employees said that they would continue to work, but fewer hours; 37% would continue to work for pleasure and 13% would do the rest, but IT.

In this study it is not possible to ignore the results of PwC experts' research, which they performed by commission of the European Business Association. The result of this study was, for example, the following facts: over the past four years, IT's contribution to Ukraine's GDP has increased from 0.6 to 3.3 percent (from 1.1 to 2.7 billion dollars), that is, more than in 5 times; the number of programmers has increased from 42.4 thousand to 91.7 thousand people. The development of this industry also has a great positive impact on the banking system of the state. In particular, the volume of mandatory sale of foreign exchange earnings is 2 billion hryvnia, and deposits of IT specialists in Ukrainian banks last year amounted to 5.8 billion hryvnia. In general, as analysts say, 19% of highly skilled professionals provide 41% in the structure of value creation. While maintaining the current tax rate, the state budget revenues in 2020 will amount to UAH 21 billion [18].

One of the problems with the development of the IT market is that IT professionals can easily find employment abroad. Over the past 12 months, from 2 to 5 thousand programmers left. The probable liberalization of the labor market with the European Union, the introduction of a visa free regime may accelerate the emigration process like the one observed in Poland and the Baltic States in 2007-2012. Due to the lack of modernization of education and the improvement of the status of its employees, a rapid decline in the level of training of future employees, in particular the IT industry, may start. Understanding of this circumstance has already prompted a number of companies, as mentioned earlier, to begin the creation of a network of educational institutions of the appropriate direction. But to provide all the educational needs of these capacities will not be enough. The development of the IT market is also very sensitive to the tax burden on the industry.

Ukraine has good reasons to rely on the stable and rapid growth of the IT market. The key to growth of the industry is to provide a comfortable tax, legal, medical and educational system, a free and open market and, of course, to eliminate external threats. The only way to achieve the described state is to eliminate the most problematic factors in doing business. According to the CEF, in 2015, corruption (with an index of 14%) and political instability (with a rate of 13.2%) remained (see Table 3.13).

Despite the negative tendencies in the dynamics of the Ukrainian economic development level in general, the IT industry is the one showing rapid growth. Over the past two decades, Ukraine:

- entered the Top 5 world freelance locations, Top 10 countries with the most professional IT specialists;
- -takes 11 positions in the Top 100 among outsourcing and high-tech countries;

- has the best security specialists and ets.

There is a slow growth the indicators of the penetration level into other sectors of the national economy of the information technology. The enterprises which develop the final product grow in number and quality.

The result of the study is a dynamic analysis of the development level and the growth potential of the Ukrainian society information processes within international rankings.

It is concluded that the preconditions for IT industry growth are:

- high level of primary, secondary and higher education;
- renewal of a high level of natural and mathematical training of specialists;
- incentive tax policy;
- development of state and non-state research centers;
- the wide implementation of information technologies in the public sector.

Further research will be devoted to the comparative analysis of the indices (according to the World Economic Forum) of the top 5 countries with the most developed IT industry and Ukraine. Formulation of possible perspectives of IT industry development in the context of state policy to strengthen Ukraine's position in international ratings.

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Section 4

Features of innovative development of separate regions in Ukraine

4.1. Formation of the innovative development potential in mountainous area of Lviv region

Komarnytskyy I.M., Komarnitska G.A.

The mountainous areas of Lviv region, in particular, the Ukrainian Carpathian Mountains, have an important natural and cultural heritage and maintain the stability of the eco-system on the neighboring territories. However, the mountainous areas face the challenges in their economic and social growth due to the complicated natural conditions that are not favorable for the economic development of the population and require a special regional development policy. The economic crisis in our country led to particularly acute social problems of the population inhabiting the mountainous areas: unemployment, small areas of the agricultural land, a specific character of life in the mountains, unequal distribution of funds to the social and humanitarian sphere.

The theoretical and applied grounds of the mountainous areas development have been studied both by the foreign and domestic scholars, in particular, such as J. Forrester, L. Velukhov, H. Lappo, V. Nudelman, B. Khorev, I. Ilin, Ye. Pitiurenko, P. Kovalenko, I. Komarnytskyy, T. Kachala, L. Shevchuk, S. Shults, etc.

In spite of the investigations made, there remain understudied the approaches to the formation of the innovative development potential within the context of the provision of the innovative changes, by means of interference of the social and humanitarian policies of the state.

The analysis of the foreign experience of formation and implementation of policy focused on the development of the mountainous areas is based on different approaches. In particular, according to the Swiss legislation, the mountainous areas development delay was supposed to be overcome primarily through the transport network infrastructure development. However, since 2008 the approach that was thought to be much too expensive, has been changed. Now the emphasis is laid on the development of regional (cantonal) policies that may receive financial assistance on the part of the federal government.

In Austria, the mountainous regions development facilitation is based on maintenance of industries that are important for their economy (of course it includes the agriculture) and only in the regions that are relatively under-developed.

In Germany (Bavaria) there have been developed the programs to favor the mountainous territories development, which include the development of tourism, agricultural industries as well as promotion of the investment projects in the production sector.

Mountainous regions in Sweden receive general and special economic support. The general support includes the provision of benefits for unfavorable geographic arrangement in the form of transport grant (up to 40% of transport costs for the companies operating in mountainous regions) and provision of incentives to entrepreneurship by decreasing of payroll tax expense.

The special support is carried out through the investment subsidies as investment in buildings, equipment, education, consulting services (a number of subsidies may reach 50% of the approved investment, that is the investment in objects, measures, included in the program of regional development) and subsidies of the employment incentives, available to firms for creating new vacancies.

Considerable is the experience of maintaining of the mountainous and remote territories development in Canada and the USA. In particular, commencing from the 1960s there were introduced in Canada the tax incentives for investment in the basic capital of the regions with high level of unemployment.

The present-day programs of regional development in Canada are focused on immunity grant (including tax, credit etc.) to small and medium enterprises as the main sector of economic development.

Economically problematic territories, which include a lot of mountainous regions, receive federal and regional (state) support of the US development: grants programs with participation of the federal support (up to 50% of the project cost), credit support, tax incentives, boost in amortization rate.

Actually, most of the countries with mountainous territories use the strategies concentrated on the compensation of influence of negative conditions in mountainous territories through production grant, investment assistance, granting of benefits to the manufacturers.

The provision of the integral approach to the steady development problems settlement in the Carpathian region of Europe is seen through the development of separate policy, focused directly on the mountainous territories, with consideration of its principles in the national and regional development strategies and programs for their implementation.

Recommendation 296 (2010) of the Congress of Local and Regional Authorities of the Council of Europe «Steady development of mountainous regions and experience of the Carpathian Mountains» calls for this.

In Ukraine, there has been developing the Macro-regional strategy of Carpathian development, which will offer this territory the possibilities for taking measures directed to the specific needs of the region. The macro-regional strategy of Carpathian region includes three main priorities:

1. The competitive Carpathian Mountains. The activity offered in the strategy is focused on strengthening of economic cooperation in the strategic macro-regional sectors: environmental industry, developed tourism and competitive agro-industrial sector through the development of clusters, development of value-added chain and construction of the macro-regional innovative eco-systems. The measures of strategy should be focused on the effective use of local resources and consider the potential of less developed territories for the improvement of the competitiveness of the whole region;

2. Green Carpathians. The strategy foresees the protection of environment and activities on ecological education. Ecological projects, protection of the cultural heritage, development of Carpathian regional brand also makes the region more attractive for the tourism development;

3. Joint Carpathian Mountains. Activities directed to the improvement of Carpathian accessibility – comfortable transport, social and digital infrastructure.

The similar approaches are used in Ukraine in the development of the same documents. According to the Resolution of the Cabinet of Ministers of Ukraine as of 21.09.2011 No. 896-p the central and regional authorities were entrusted to develop the draft of the State Steady Development Program of the Ukrainian Carpathian Mountains as a component part of the EU program «Carpathian space» [6].

The delay of the program adoption by the European Union delayed the process of the development and adoption of the corresponding national program. At the same time the need for targeted program approach to a solution of tasks of economic and social development of the mountainous territories, saving of their ecological potential holds sway.

The economic development indices of the mountainous territories are several times lower than the average indices in the region and the country. It has been stipulated by the complicated conditions of running a business in the mountainous area and narrowing of a sectoral and industrial structure of the economy, low level of transport and engineering infrastructure development, the absence of effective tools of government support to maintain the economy of the mountainous regions, which is mainly depressive by its nature.

The state of economic development caused the problems related to employment of the local population, among which the acutest ones are unemployment and hypertrophic external labor migration.

As a result, the level of life of people inhabiting the mountainous territories of the Carpathian Mountains remains low, the social and demographic problems become even acuter – depopulation, social degradation, washing out of the intellectual potential, threatening to lose the cultural heritage of mountain dwellers [3].

SWOT-analysis of the mountainous territories development (Tables 4.1, 4.2 and 4.3) visually demonstrates their main weaknesses and strengths, as well as risks and possibilities for the development.

Table 4.1. SWOT-analysis of the key spheres of the mountainous territories development. Economic development

Strong points	Weaknesses
Availability of land resources for the creation of new enterprises	Lack of investment resources for the development of the economy in the region
Possibilities	Threats
Starting of new enterprises within the framework of the projects' implementation	Unsustainable legislation and taxation system

Source: developed by authors

Table 4.2. SWOT-analysis of the key spheres of the mountainous territories development. Engineering infrastructure

Strong points	Weaknesses
1. Development of residential buildings 2. The readiness of the city authorities to solve the problems in the sphere of communal infrastructure development.	1. Poor quality of road surface. 2. Nonscheduled transport connection with remote villages. 3. Substantial wear of the means of transport. 4. Substantial wear of the main networks of heat and water supply as well as a water drain. 5. The population is not satisfied with the level of housing and public utility services
Possibilities	Threats
1. Improvement of road conditions. 2. Improvement of the transport connection. 3. Renewal of the means of transport, construction of new networks of water and gas supply	1. Worsening of the communal infrastructure state of the region. 2. Limited experience and knowledgeability in attraction of the domestic funds or financial assistance of foreign funds

Source: developed by authors

Table 4.3. SWOT-analysis of the key spheres of the mountainous territories development. Social infrastructure

Strong points	Weaknesses
1. Developed social infrastructure network 2. High professional, educational, cultural level of the population. 3. Availability of health-improving and recreational potential. 4. Availability of cultural heritage objects	1. The unsatisfactory material-and-technical condition of the social infrastructure objects. 2. Underfunding of cultural, medical, educational and sports institutions. 3. Poor level and quality of social and medical services provision, insufficient supply of medical establishments with modern diagnostic and treatment equipment and high-quality drugs. 4. Personnel deficiency for cultural, medical, educational and sports institutions
Possibilities	**Threats**
1. The attraction of small and medium enterprises to the settlement of social problems of the region. 2. Creation of conditions for studying and retraining of workforce. 3. Improvement of primary medical assistance to the population. 4. Improvement of public health and prevention of diseases. 5. Complete computerization of the educational establishments. 6. Promotion of architectural and historical objects, the organization of different festivals, exhibitions and sports events	1. Unsustainable legislation and taxation system.

Source: developed by authors

Common problems of mountainous territories– insufficient business development and low investment attractiveness, transport, road infrastructure, and ecological problems.

Economic, social and ecological problems and ways of their settlement are interconnected. These problems should be settled by public and local authorities, business entities, research institution, public organizations and citizens of the region. It is important to use the possibilities of transborder and international cooperation that will be provided by participation in the European programs of territorial cooperation. Complex settlement of issues with the broad participation of all interested parties is possible in case of development, adoption, and execution of the target Programs of the mountainous territories development in Lviv region.

Low level of development and effectiveness of the institutional bodies, the absence of appropriate road and transport connection, sufficient

number of objects of the market, financial, social and informational infrastructure.

The level of the institutional environment development in the mountainous regions does not meet the up-to-date requirements and objective needs of business entities. High-quality support and business maintenance services, improvement of access to the resources and markets may be received by the entrepreneurs only in the regional and district centers, big cities. On the territories of the districts, there are no business incubators, business support centers, there are underused such institutional instruments of the small and medium enterprises development promotion as the regional and local development agencies;

7. Problems of formation, development, and reproduction of the human capital.

Worsening of social and economic development of mountainous areas in Lviv region inspires local population, first of all, the youth, to go abroad and move to big cities and work there. It happens because the payroll rate is much higher, the labour market is more saturated, there is developed infrastructure and better living conditions. It complicates the formation and effective use of intelligent and workforce capacity of small and medium enterprises of mountainous regions.

Let's analyze the results of the problem sociology studies. In order to detect the reasons causing the above-mentioned problem, as well as key-obstacles and promising directions and means that favor small and medium enterprises development located in the mountainous areas of Lviv region there was held an opinion poll of these subjects' representatives, carrying out their activity on the territory of the regions.

The opinion poll was held in June 2017. There were interrogated 85 respondents that make above 2% of the total amount of those involved in small and medium enterprises in the analyzed regions.

There has been established that the main (the most problematic aspects of functioning and development of small and medium enterprises subsequent to the ranging results) problems of mountainous areas of Lviv region in the year 2017 have been as follows:

- Firstly, absence (insufficient amount) of financial, investment and resources' provision. Within the structure of this the most up-to-date problem for the development of small and medium enterprises in mountainous areas of Lviv region there have been determined the most substantial defects:
  - the high cost of bank crediting;
  - the absence of financially capable investors;
  - insufficient financial state and limitation of own financial resources of small and medium enterprises;

- Secondly, worsening of human capital, lack of skills, necessary to start and carry out business activity because of poor working conditions, caused inappropriate condition of personal service facility of the population and social infrastructure, low level of job prestige in a village, limitation of profits of the rural population, worsening of cultural objects and insufficient condition of the rural medicine infrastructure, high level of unemployment, worsening of ecological situation and environment protection state;
- thirdly, unfavorable business environment on the territory of mountainous regions (limitation of demand, resources, investments, neglect of infrastructure, insufficiency of social and living conditions) and absence of formed efficient economic stimuli to formation and development of investment activity of small and medium enterprises, attraction of funds owned by population and external migrant workers for the investment purposes.

Within the structure of business environment defects of the mountainous areas of the region the most problematic aspects remain the following:

- underdevelopment of the territory infrastructure;
- insufficient amount of financial infrastructure objects;
- unformed market infrastructure;
- undeveloped internal market of the region.

On the territory of mountainous areas of the region, there is actually carried out no activity directed to the formation and financing of investment, innovative and other small and medium enterprises development funds, maintenance of functioning and further development of the investment entrepreneurial infrastructure.

The economic and physiological stimuli as well as mechanisms of attracting monetary funds of migrant workers into business development are insufficient. In spite of the substantial amount of cash transfers which exceed a number of investments that come to the economy of the mountainous areas, migrant workers mainly spend their funds to buy real estate, vehicles, longstanding objects) to pay for their children's education. However, there no effective mechanisms to start own business by the migrant workers, which is in most cases stipulated by low level of trust to the public and private institutions, insufficient level of the investors' rights protection, higher risks of running a business, high transactional costs;

- Fourthly, insufficient statutory regulation of the entrepreneurial activity:
    - availability of preferences for separate business entities or selective administrative discrimination;

- presence of express prohibition or restrictions for the business;
- the excessive regulatory pressure of separate permissible and other procedures;

- Fifthly, low level of efficacy and effectiveness of the regional and local strategies and programs maintaining small and medium enterprises, their focus on the realization of a significant amount of events that are servicing not investing by their nature that is mainly implemented in the center of the region. Low level of program effectiveness especially those supporting small and medium enterprises stipulated by their mainly declarative character, absence of specific events directed to the creation of new enterprises or development of the existing ones, starting new kinds of business activity, as well as not taking into consideration the specific feature of each territory development;
- Sixthly, the absence of effective institutions and mechanisms of financial and crediting, investment and informational provision, creation, and development of cooperative relations between the small and medium business entities.

The obstacles on the path of cooperative relations development of small and medium enterprises are stipulated by both objective (presence of institutional barriers, insufficient amount of financial, crediting and investment provision), and subjective factors (incomprehension by the head of the enterprises the expediency and economic necessity of cooperation, insufficient amount of psychological stimuli to cooperation). The cooperation development is also hindered by the insufficient informational support of development and promotion of its advantages, the unwillingness of the entrepreneurs to take additional risks, lose part of control over the business processes and the necessity to agree on the adoption of management decisions.

Cooperative movement among the small and medium manufacturers one of the most effective European tools of the steady development. Through the cooperation system, the small producer may receive state support, donor assistance and access to credit resources. In this regard, it is worth adopting the methods on how to create the cooperatives from the USA, Canada, China, Korea and countries of the EU. In particular, it refers to the process of attracting the agricultural products of small producers into the economic circulation. It is reasonable to start the similar initiatives within the limits of the strategies of social and economic development of mountainous areas of the region, as well as regional and local programs of small and medium enterprises support;

Seventhly, unformed positive economic and legal environment for the commercial economic activity.

Weak policy effectiveness of regional and local authorities, as well as self-government bodies oriented to the development of small and medium enterprises, is to a considerable extent stipulated by a low level of attraction of its representatives to the settlement of the territories development issues.

The level of attracting funds from the International programs of technical assistance with the purpose of development of small and medium enterprises is insignificant. At present, the local state administrations and self-government bodies do not provide a system promotion of activity in this direction that is why the implementation of the uncoordinated projects and events within the limits of the entrepreneurship support programs for a minor amount are unable to qualitatively improve the situation regarding the development of small and medium enterprises.

Within the structure of the kinds of economic activity the highest potential among the small and medium enterprises development has the tourism (49,8% in the structure of respondents' opinion), hotel and catering business (24,8%), agriculture and forest industry (8,2%), trade (7,5%), services (6,0%) [1].

The most promising directions for the development and business effectiveness increase in mountainous areas of the region according to the respondents are as follows:

- opening of new business objects (26,3%);
- starting new business including those at the expenses of the migrant workers (19,2%);
- creation of clusters (other local integrated structures) (17,2%);
- start and extension the cooperation practice (15,1%);
- creation of new small and medium enterprises (11,1%);
- the increase of the amount of employed in small and medium business sector (8,1%) [7].

In the rating of social and economic development of the districts of Lviv regions, which is calculated by the regional state administration on a monthly basis, the mountainous territories are constantly in the second part except for Skole district, which due to attraction of big taxpayers («ОККО») has strong financial performance – in 2017 the rating position of the district has significantly improved.

The industry, investment development and support of entrepreneurial initiative in the mountainous territories remain problematic.

Mountainous areas of Lviv region are characterized by the lower level of social and economic development in comparison with the center of the region and more industrially developed territories of the region (Table 4.4) [4].

Table 4.4. Comparative characteristics of separate indicators of social and economic development of Lviv region, its mountainous and other districts, 01.01.2017

Territory	Sold production of industry per unit of population, thousand, UAH	Retail sales volume per unit of population, thousand, UAH	Main capital investments per unit of population, thousand, UAH	Number of enterprises per 1 thousand of people, units.
Lviv region	26,8	3,1	6,8	6,2
Mountainous districts	2,7	0,7	1,3	1,9
Other districts of the region	25,8	1,4	5,6	4,1

The objective reasons of such condition is the lower financial and investment provision because of territorial remoteness from the center of the region, specific feature of the economic structure, stipulated by relief and natural-climatic peculiarities, lack of labour force (especially those with blue-collar occupation) due to in immediate proximity to the border and high level of labour migration of the population, incorrect use of the territory development potential, including by implementation of business projects by small and medium enterprises.

In order to receive the possibility of the investment project financing and attraction of new investors, it is necessary to enlarge the investment objects database. As of 01.07.2017 among over 700 investment objects of Lviv region that are publicly available on the website of Lviv Regional State Administration, only there were 109 objects that are placed immediately in the mountainous districts. Drohobych district is the most active among those promoting own investment opportunities, which provided the information that it has 35 objects, the least active is Skole district (16 objects) [7].

In order to create favorable environment for the development of small and medium enterprises and attraction of investments into the development of mountainous areas of Lviv region it is necessary to take the following measures:

Towards the improvement of financial and resource provision:

- intensify efforts to attract enterprises to be financed within the frameworks of the micro lending Program directed to the increase of competitiveness of Lviv region;
- intensify activity to attract and implement EU grant programs on the territory of the districts as the sources of financial assistance for small and medium enterprises development (valid and potentially attractive are as the following programs: Horizon2020 (financing of

research projects focused on the development of small and medium enterprises), Competitiveness of Small and Medium Enterprises (program aimed to increase the level of small and medium enterprises competitiveness, access to new markets, preservation of the companies stability in the competitive business environment, development of entrepreneurial culture), LIFE (program in the sphere of protection of the environment), Pericles 2020 (project of the experts exchange), Poland-Belarus-Ukraine Programme, Hungary-Slovakia-Romania-Ukraine Programme, Romania-Ukraine Programme, Black Sea Programme (transborder programs directed to the development of cooperation between the joint borders of the member- countries);

- initiate the support of financial and leasing programs of small and medium enterprises development in the districts for modernization of material and technical, technical and technological base of the real economy sector objects – small and medium enterprises with the possibility of partial compensation of cost of the purchased equipment and tools at the expenses of regional and local budgets; development of agrarian and food markets, creation of storage points, purchase and processing of the agricultural products;

Towards the improvement of business environment:

- provision of economic stimuli formation for the creation of local integral industrial system, horizontal and vertical cooperation of small and medium enterprises by means of formation of the database of typical business plans for the formation of the cooperatives in different kinds of economic activity; organization of the periodic consulting schools business trainings on organization and carrying out of cooperation activity; organization and conducting the periodical trainings for the heads of the companies (regarding registration, administration, bookkeeping, taxation); promotion and advertising of the cooperative movement among the rural population in order to favor the entering of own farms into vertical production and selling economic systems, promotion of the process of formation of agricultural horizontally and vertically- integrated clusters;
- provide the information and consulting support of the population on how to start own business, on how to improve social and psychologic, organizational and professional environment of the business activity through the district employment centers, local consulting, studying and training for the rural population, provision of financial and organizational assistance by the organizations that carry out educational activities in the business area.

The particular advantages of mountainous regions are in the recreation resources of the mountainous territories, which primarily includes, different mountain landscapes, a wide variety of healing mineral water,

favorable natural and climatic conditions, availability of many unique natural, historic and cultural monuments, favorable ecological environment. All the above-mentioned presents wide development prospects in the mountainous territories of tourist and recreation sector and its investment attractiveness, allows forming the tourist and recreational development direction of the mountainous territories, focused on both internal and external needs. This branch will have a positive influence on accompanying and neighboring industries of the agro-industrial complex and folk craft.

The development of the tourism in the region will stimulate economic activity, development of small and medium enterprises will favor the creation of new workplaces in different sectors of the economy.

The peculiarity of the mountainous territories of Lviv region include practically infinite possibilities for recreation, health improvement, and tourism. The region has the unique possibilities for the development of different types of tourism and sanatorium-and-health-resort sector.

Especially attractive for the tourists are expressed mountain ranges: Verkhovynskyi, Vododilnyi, Rozlutskyi, Sianskyi, Vysokyi Verkh.

One of the most popular tourist trails through the mountain pass «Ruska Put» leads to Pikui Mount. It is designed for pedestrian tourism, which will not be difficult to cover 33 km in two days. The pedestrian tourists will have to climb up to 852 m.

The picks of these mountain ranges, except for marvelous landscapes have been eyewitnesses of numerous historical events.

The region is rich in mineral water springs (like «Nafrusia», «Sodova», «Zalizna» and «Esentuky»).

The key measures for the development of tourist potential of mountainous territories include the improvement of accessibility and territory promotion. The peculiar feature for the implementation of these measures has an inter-branch character – as long as the construction of the road infrastructure, promotion of the region is carried out within the framework of multiple regional and local programs.

The development of mountainous territories should be focused on the development of their social and economic infrastructure, provision of ecological and social safety of the local population.

It is necessary to form the understanding of the mountainous policy as the instrument for a complete realization of social-economic problems of the population living in the mountainous regions. The basis for this policy is the definition of the notion that mountains are an exceptional natural and cultural heritage that should be taken care and developed. The key role in the process of preservation and development of this heritage plays constant presence (residence) of people in the mountainous

areas: firstly, as an integral part of this heritage; secondly as a necessary condition for the provision of effective protection of landscapes and natural resources of mountains, as long as the specific feature of mountainous areas (the inaccessibility, roughness of relief, remoteness of inhabited localities etc.) complicates the provision of the basic needs of the population.

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4.2. The development of grape growing and gardening in Odessa region (logistic approach)

Nikishyna O.V., Bondarenko S.A., Liganenko I.V.

The last decade global trend has been a significant increase in the volumes of production and sale of table grapes, fruits and berries, products availability throughout the calendar year, the dynamic development of post-harvest technology and logistics. The European market is characterized by a rather high demand for fruit-and-berry gardening and winegrowing of table varieties, with the demand not only raw materials, but

also processed products. According to a review of FAO statistics, since 1961, fruit production in the world has increased by more than 3,3 times. The average annual growth rate is 6,8% [1].

Ukraine occupies an insignificant volume in the vineyards, fruit-and-berry crops area (about 0.4% of the world scale), with the tendency to become a decline in the scale of the external market. To enter external markets, it is necessary to meet the world trends and requirements for product quality. It is important to ensure predicted production volumes, control over the spread of varieties and planting material, guarantee the safety and quality of products, as well as introduce higher and advanced technology.

The main problems in the development of fruit-and-berry gardening and viticulture in Ukraine are due to imbalances at each production and logistics chain stages:

- selection and scientifically grounded sorting of planting material, microzonal orchard and vineyards start;
- cultivating apples and grapes;
- storage, freezing, processing of the products;
- domestic and international sales.

These are the following issues:

- The plantation placement without taking into account agro-ecological conditions of the territory, selection of assortment and planting schemes;
- imperfection in existing technologies of apple and grapes laying and production, insufficient level of innovations and advanced breeding developments;
- undeveloped regional logistics system, lack of links after harvesting apples and grapes (sorting, packaging, prolonged storage, extension of the implementation period);
- imbalances between the domestic supply volume and demand one, the lack of high quality apples and table grapes for the needs of end-users and processing enterprises, import products supply;
- unrealized production and export potential of horticulture and viticulture in the region, state tax and social losses.

During the investigated period from 1990 to 2016, a negative trend was observed in reducing fruit-and-berry plantations areas from 39 thousand hectares in 1990 to 10,700 hectares in 2016 (by 72,6%), grape plantations – twice (from 62,9 to 31,6 thousand hectares, respectively) (Table 4.5).

Table 4.5. The dynamics of fruit-and-berry and vineyards areas in the Odessa region

Planted area	Years									From 2016 % to 1990.
	1990	2000	2010	2011	2012	2013	2014	2015	2016	
1. Planted of fruit-and-berry area, thousand hectares	*39,0*	*23,0*	*10,7*	*10,8*	*10,4*	*10,5*	*10,6*	*10,6*	*10,7*	*27,4*
in % to state areas	4,6	5,4	4,2	4,2	4,1	4,2	4,4	4,5	4,5	X
2. Planted of fruit-and-berry area in the fructiferous period, thousand hectares, total	*30,5*	*21,1*	*9,1*	*9,0*	*8,5*	*8,8*	*8,7*	*8,0*	*8,1*	*26,6*
in % to the areas of the region fruit-and-berry planting	78,2	91,7	85,0	83,3	81,7	83,8	82,1	75,5	75,7	X
in % to state areas	4,5	5,6	4,1	4,0	3,8	4,0	4,1	3,9	4,1	X
2.1. including the area of pip fruits, thousand hectares	18,8	10,8	3,2	3,2	2,8	2,8	2,6	2,3	2,2	11,7
2.2. the area of drupaceous, thousand hectares	8,0	9,1	4,7	4,7	4,6	4,8	4,9	4,5	4,6	57,5
3. Grape plantations area, thousand hectares	*62,9*	*44,1*	*35,9*	*36,1*	*32,9*	*31,6*	*30,2*	*30,2*	*31,6*	*48,0*
in % to state areas	35,7	40,1	41,3	43,0	42,2	42,1	61,6	67,1	66,9	X
4. Planted of grape area in the fructiferous period, thousand hectares	*55,1*	*40,3*	*28,0*	*29,4*	*29,1*	*28,5*	*27,5*	*25,5*	*27,4*	*46,3*
in % to the areas of the region grape planting	87,6	91,4	78,0	81,4	88,4	90,2	91,1	84,4	86,8	X
in % to state areas	38,5	40,7	41,2	42,6	42,8	42,5	62,5	60,7	64,2	X

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

According to official statistics, the share of Odessa region in the public areas of fruit-and-berry plantations is 4,5%, grapes – 67%.

The reason for a significant reduction in the fruit-and-berry plantations area was the collective farms destruction and the negative experience of decomposing land when the gardens ceased to be processed and uncontrolledly destroyed. Regarding the vineyard plantings area,

technical varieties landing of grapes (for the production of wine materials and winemaking products) and table varieties (for direct consumption by the population) were in different positions. Given the loss in recent years of the usual markets, especially the Crimea winemaking enterprises, where the wine materials of the Odessa region were spilled, small farms that grew grapes technical varieties were in a particularly difficult situation. So, if the branded wine brands local manufacturers, who formed the full production cycle on the principles of agro-industrial integration from cultivating grapes to the finished products bottling, close their needs at the expense of their own vineyards, then the farms wine materials remain unclaimed. There are few companies with a full cycle of growing grapes to produce winemaking finished products in Odessa oblast, but they produce 70% of the wine total volume. For two consecutive years, farms producing technical grapes have no place to sell their produce. Therefore, it is advisable to develop the newest mechanisms for the interaction of farms and large processing enterprises to ensure the grapes implementation and processing of technical varieties. Of course, solving the integration mechanisms of the industry is possible only with the state participation, provided that the development of compensatory mechanisms and the formation of cooperative unions, which will form the basis for interaction on the vertical and horizontal integration bases of economic entities.

The reason for the area reduction of the table varieties vineyards were the financial and economic factors (high capitalization of the vineyard and lack of state support) and infrastructure. Favorable natural conditions in the Odessa region provide high yields of grapes and apples. At the same time, the high profitability of the apple and grapes production in the region is ensured by using the ampeloecological potential of the region and the introduction of resource-saving technologies in planting, cultivating and storing produce. Despite the increase in the yield of fruit-and-berry plantations in 3 times (from 36.4 c / ha in 1990 to 104.3 c / ha in 2016), grapes – in 1,5 times (from 61.2 to 84.5 centners per hectare, respectively), we have a decrease in the output of fruits and berries by 23.5% (from 111.2 thousand tons in 1990 to 85.1 thousand tons in 2016), grapes – by 31,5% (from 337.6 to 231.2 thousand tons, respectively) (Table 4.6).

In the state production of fruits and berries, the Odessa region accounted for 4.2%, grapes – 61.2%. In the regional structure of fruit production in recent years dominated by drupaceous fruits (53.9% in 2016), while in the state structure – pomiferous fruits (62.9%), among of which 55% are apples.

Table 4.6. Dynamics of fruits, berries and grapes production in the Odessa region, ths. tons

Criterion	Years									From 2016 in % to1990
	1990	2000	2010	2011	2012	2013	2014	2015	2016	
1. Fruits and berries, total	*111,2*	*66,1*	*74,3*	*88,0*	*81,2*	*82,9*	*74,0*	*84,9*	*85,1*	*76,5*
in % of the state production	3,8	4,6	4,3	4,6	4,0	3,6	3,7	3,9	4,2	X
1.1. Including pomiferous fruits	*79,9*	*28,0*	*28,3*	*30,6*	*30,5*	*28,8*	*24,9*	*26,9*	*29,6*	*37,0*
in % of the state production	3,6	3,4	2,7	2,7	2,4	2,1	2,0	2,0	2,3	X
1.2. Drupaceous fruits	*24,3*	*31,7*	*37,1*	*47,2*	*41,8*	*45,2*	*40,7*	*48,5*	*45,9*	*188,9*
in % of the state production	4,2	6,3	7,5	8,6	8,5	6,9	7,9	8,9	9,0	X
The production of fruit output per one person	*42*	*27*	*31*	*32*	*28*	*35*	*31*	*35*	*36*	*85,7*
2. Grape	*337,6*	*201,4*	*175,1*	*229,1*	*212,3*	*256,6*	*263,7*	*238,7*	*231,2*	*68,5*
in % of the state production	40,4	39,2	42,9	43,9	46,6	44,6	60,5	61,8	61,2	X
The structure of regional fruit industry, % (+, -)										
1. Pomiferous fruits	71,9	42,4	38,1	34,8	37,6	34,7	33,6	31,7	34,8	-37,1
2. Drupaceous fruits	21,9	48,0	49,9	53,6	51,5	54,5	55,0	57,1	53,9	+32,0

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

A significant volume share in the production of berries and grapes in Ukraine is made by farms (42% – in viticulture, 96% – gardening), which grow small batches of products (up to 10 tons, depending on culture), limited in financial resources and do not set as a technological development of its production. In addition, only about 5-6% of the crop is supplied to the market, mainly the products are for domestic consumption. Therefore, most fruits are produced by the domestic market.

Regarding infrastructure facilities for the industry development, the lack of high-quality fruit storage facilities is most acute, which can provide long-term storage of ripe berries until they are sold to the final consumer. Under condition of the fruit storage facility use, the sales volumes growth may be due to the reduction of domestic consumption in private households (PH) and the growth of sales volumes on the market, processing enterprises. Thus, a fruit storage facility, based on which the functioning of the accumulation and distribution center is expected, becomes a platform for attracting households to market infrastructure. Its main function is the efficient management of the fruit flow, the formation of large lots from small consignments (coming from PH), their sorting, redistribution to domestic consumption (through trade networks) or processing into juices. PHs can also get a set of services for fruit harvesting (packaging), and independently sell them to retail chains. Currently, there is no fruit storage in Odessa region, which, of course, significantly impedes the development of market mechanisms in the fruit and berry gardening and viticulture.

All these factors lead to a shortage of products in the domestic market, the need for its supplies from abroad. In 2016, the volume of imported table grapes doubled the volume of self-grown (Figure 4.1).

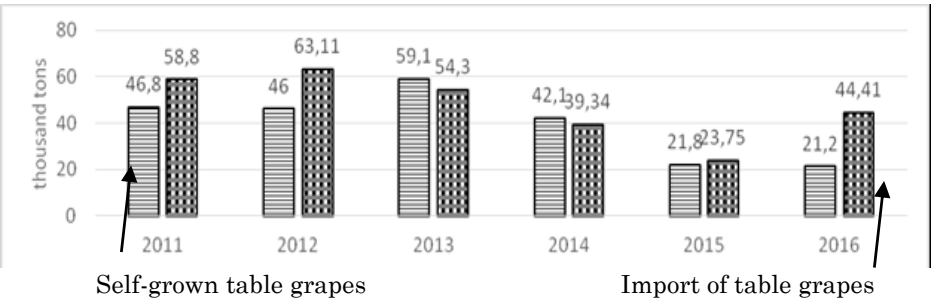

Figure 4.1. The growing and import of table grapes to Ukraine, thousand tons

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

The growth rate of products export (in 3,7 times in 2015 compared to 2000) exceeds the growth rate of its imports (in 3,3 times). In 2015, the volume of fruits, berries and grapes import (588 thousand tons) reached 23% of the volume of their state production, almost twice exceeding the export rate (324 thousand tons, 13% respectively) (Table 4.7).

Table 4.7. Geographical structure of horticulture and viticulture export-import in Ukraine, 2016

UKTZED code	Goods item	Import			Export		
		country	cost, thousand dollars	Unit weight, %	country	cost, thousand dollars	Unit weight, %
806	Grape	Turkey	15808	46,45	Moldova	40	63,49
		Iran	6830	20,07	Georgia	13	20,63
		India	6175	18,15	Panama	3	4,76
		Others	5218	15,33	Others	7	11,12
Total		X	34031	100	X	63	100
808	Apples, Pears and quince	Poland	10484	86,67	Belarus	1721	54,72
		the Netherlands	782	6,46	Georgia	295	9,38
		South Africa	167	1,38	Libya	253	8,04
		Others	664	5,49	Others	876	27,86
Total		X	12097	100	X	3145	100
809	Apricots, cherries, Bing cherries, peaches, plums	Greece	8510	43,07	Belarus	778	89,43
		Spain	6016	30,45	Moldova	72	8,28
		Turkey	2456	12,43	Poland	10	1,15
		Others	2777	14,05	Others	10	1,14
Total		X	19759	100	X	870	100
810	Other fruits, fresh	Turkey	11756	33,06	The Netherlands	3554	40,23
		Azerbaijan	5166	14,53	Poland	2861	32,39
		Spain	4853	13,65	Belarus	1285	14,55
		Others	13784	38,76	Others	1134	12,83
Total		X	35559	100	X	8834	100
811	Fruits and nuts, raw or boiled, frozen	Poland	3569	75,71	Poland	18873	37,1
		China	482	10,22	Italy	5598	11
		Canada	125	2,65	Germany	4478	8,8
		Others	538	11,42	Others	21928	4,31
Total		X	4714	100	0	50877	61,21

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

The capacity of the table grape market in Ukraine is 450-500 thousand tons at a consumption rate of 12 kg per capita. In fact, in 2014, 1.4 kg was produced – that is, 8.5 times lower than normal. With due regard to imports – this figure amounted to 2.15 kg, which is six times lower than the consumption rate. The projected estimate of the growth in domestic demand for fruits, berries and grapes in the Odessa region

and Ukraine indicates the potential for growth in domestic demand, provided that the needs of the population in apples and table grapes are met according to rational consumption norms. According to the data of Table 4.8, the volume of this potential in the region is 71.23 thousand tons, in the state – 1671.9 thousand tons.

Table 4.8. Forecast calculation of domestic demand growth for fruits, berries and grapes in Odessa region and Ukraine

Rate	Odessa Region	Ukraine
1. Actual annual consumption in 2015, kg per person	60,2	50,9
2. Sustainable annual standard rate of consumption, kg per person	90	90
3. Spread between sustainable and actual consumption, kg per person	29,8	39,1
4. Population base, thousands person	2390,3	42760,5
5. Runup of internal request, thousand tons (3*4)	71,23	1671,94
In % to production level, 2015	*22,01*	*65,85*

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

The primecost of fruit and grapes in the region is in 1.5 and 1.1 times higher than the country's average, the profitability of grapes in 2016 (37.4%) is much lower than the state indicator (74.6%), which indicates a low-level intensity of production. In fact, the industry is characterized by weak technological equipment, namely: material and technical base depreciation, machinery shortage for mechanized harvesting, sorting and calibration of products, prolonged storage and processing of fruits and berries. Basically, the harvest is hand-picked and preliminary sorting at the same time. All these facts influence over the product quality, which, of course, does not suit the modern age of the world market, and hence, and the product marketability is very low.

To develop the horticulture and viticulture in the Odessa region, it is necessary to introduce a sequence of concrete actions of innovation-oriented character at the selected stages of the production-logistic chain:

Stage 1. Selection and scientifically grounded sorting of planting material, microzonal vineyard laying. Proposed:

- to use the proficient, high quality and certified seedlings;
- to innovate the planting allocation, to implement zoned varieties of NNC «Institute of viticulture and winemaking named after V.E. Tairov»;
- intensive, resource-saving technologies in laying and nursing care of planting;
- to increase the planting areas to 50%, to increase the yield due to varietal structural adjustment (Table 4.9).

Table 4.9. The development parameters of apple gardening and grape growing in Odessa region as the result of project implementation

Criterion	Reference period (2016)	Forecast period						6th year in % to the reference period, times
		1st year	2nd year	3d year	4th year	5th year	6th year	
1. Apple gardening								
1. The area of new plantation, thousand hectares	X	0,31	0,31	0,47	0,16	X	X	X
2. Disposal area, thousand hectares	X	0,16	0,14	0,10	0,10	X	X	X
3. General area, thousand hectares	*2,06*	2,21	2,38	2,75	2,80	2,80	2,80	136,5
Including plantations in the fructiferous period	*1,56*	1,56	1,56	1,77	1,98	2,45	2,61	167,4
4. Yield, thousand hectares	*12,8*	13,4	13,9	15,2	15,8	16,3	17,0	133,1
5. Production, thousand tons	*19,9*	21,0	21,7	26,9	31,3	39,8	44,3	222,8
2. Grape growing								
1. The area of new plantation, thousand hectares	X	6,3	6,3	5,8	X	X	X	X
2. Disposal area, thousand hectares	X	2,8	2,8	2,6	X	X	X	X
3. General area, thousand hectares	*31,6*	35,1	38,6	41,7	41,7	41,7	41,7	*132,1*
Including plantations in the fructiferous period	*27,4*	27,4	24,6	21,9	28,3	34,6	40,4	*147,4*
4. Yield, thousand hectares	*8,45*	9,77	10,20	10,62	11,04	11,46	11,46	*135,6*
5. Production, thousand tons	*231,2*	267,7	250,5	233,1	312,1	396,4	462,8	*200,2*

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

Stage 2. Apples and grapes growing. Proposed:

- production conveyor of table grapes (very early afterripening - 22%, early – 17%, medium – 17%, middle and late – 22%, late – 22%) – 60-65% of area growth;
- special varieties of grapes for juice production – 40-35% of area growth;

- combination of intensive and organic apple production technologies, drip irrigation;
- double increase in the apples and grapes production (Table 4.10).

Expected effects:

- double growth of regional apples and grapes production (from 251.1 to 507.2 thousand tons);
- regional areas expansion of plantations in the fructiferous age for 6 years by 50%, incl. apples from 1,56 to 2,61 thousand hectares, grapes from 27,4 to 40,4 thousand hectares;
- increase in the productivity of apples and grapes in 1,3 times;
- Income support of apples and grapes regional production, earnings enlargement from products sales by 5,4 times, profit to 1 hectare of plantations by 6,2 times, increase of products profitability from 36,7% to 83,6%;
- Increase of the employed number in the regional horticulture and viticulture by 1,3 times;
- increase of tax revenues;
- Providing food security to the region and country.

Stage 3. Storage, processing of products. Proposed:

- construction of a fruit storage facility, equipped with adjustable gas atmosphere;
- use of sorting lines for apples and grape varieties;
- to create a specialized direction of organic products provision (apples and grapes) for the production of baby food products on the basis of PJSC «Odessa Cattery of Baby Food».

Stage 4. Implementation of products on the domestic and foreign markets. Proposed:

- sales of products throughout the year at prices higher than the prices of the harvest period (the potential for growth of domestic demand in the region is 71.23 thousand tons, in Ukraine – 1671.9 thousand tons);
- export of dried fruits, juice products (export prices of products processed 3-4 times higher raw material prices);
- potential markets: EU countries, North America (USA and Canada).

Table 4.10. Economic indicators of apple gardening and viticulture development in the Odessa region as a result of project implementation

Criterion	Reference period (2016)	Forecast period						6th year in % to the reference period, times
		1st year	2nd year	3d year	4th year	5th year	6th year	
1.Apple gardening								
1. Volume of apple sales, thousand tons	3,98	6,29	8,69	13,43	18,79	23,88	26,60	6,7
2. Sales revenues, mln hrn	26,3	50,8	78,0	139,7	215,4	307,2	384,7	14,7
3. Profit, mln hrn	4,5	12,9	21,6	45,4	74,2	115,3	156,0	34,8
4. Profit to 1 ton, hrn	1127	2058	2482	3383	3950	4829	5864	5,2
5. Profit to 1 hectare, thousand hrn.	2,88	8,29	13,82	25,66	37,45	47,08	59,88	20,8
6. The cost of marketable output to 1 hectare, thousand hrn	16,88	32,53	50,00	78,89	108,64	125,43	147,68	8,8
7. The level of profitability, %	20,6	34,2	38,2	48,2	52,6	60,1	68,2	3,3
8. Volume of employment, thousands people	0,87	0,94	1,01	1,17	1,19	1,19	1,19	1,4
2. Grape growing								
1. Volume of grape sales, thousand tons	136,3	160,6	150,3	139,8	218,4	277,4	324,0	2,4
2. Sales revenues, mln hrn	686	998	1056	1106	1918	2636	3461	5,0
3. Profit, mln hrn	187	351	402	448	820	1142	1595	8,5
4. Profit to 1 ton, hrn	1370	2184	2677	3206	3752	4117	4924	3,6
5. Profit to 1 hectare, thousand hrn.	6,82	12,80	16,38	20,43	29,00	33,03	39,50	5,8
6. The cost of marketable output to 1 hectare, thousand hrn	25,04	36,43	43,02	50,38	67,87	76,20	85,69	3,4
7. The level of profitability, %	37,4	54,2	61,5	68,2	74,6	76,5	85,5	2,3
8. Volume of employment, thousands people	13,43	14,91	16,38	17,74	17,74	17,74	17,74	1,3

Source: (compiled according to the State Statistics Service of Ukraine data [2, 3])

The proposed measures provide an opportunity for domestic market saturation (import substitution), the annual provision for the population by national fruit and grape production, supplying the infant food manufacture by domestic organic products (apples and grapes), expansion in the export of fruits and derivative products (in particular, juice products).

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4.3. Innovative trends in management of the development of Ukrainian port infrastructure

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In the context of social, political and economic transformations currently happening in Ukraine, when all sectors of the national economy undergo reforms, the reform of infrastructure becomes one of crucial, high-priority problems. Of particular importance is the improvement in management of its economic and organizational development. In this regard, it is now relevant to study the issues of introducing advanced practices in management of the development of the Ukrainian port infrastructure, which is the aim of this publication. The paper presents a summary of the experience that the EU countries have had in this respect and outlines possible vectors of its application in the realities of the present-day Ukraine.

According to the Global Competitiveness Index for 2016-2017, Ukraine ranks 96th in the world by the quality of port infrastructure [1], taking the place between Cape Verde (95th) and the Czech Republic (97th).

Seaports play an important role in increasing the competitiveness of a country or a region, as they serve as transport hubs that provide economic links between the domestic and foreign markets. Therefore, it is not surprising that the most influential rating of this kind, The Global Competitiveness Index, contains the component Port Infrastructure Quality.

Countries with the highest-ranking port infrastructure (the Netherlands, Singapore, and the UAE) are continually increasing the quantity of ports and enhancing their quality. For example, the largest and most important harbor in Europe – the Port of Rotterdam – offers foreign companies a perfect springboard to the European market, as goods can be delivered from there to all major industrial and economic centers of

Western Europe in less than 24 hours. Meanwhile, the Dutch government is continually improving its port infrastructure by spending around €150 mln annually on maintenance and expansion of roads and berths, safety and environmental upgrades, as well as other changes [2]. This indicates that port services go far beyond the port itself (its internal and external water area) and cover a large number of coastal and other business operations.

To address these issues, European countries are looking for new forms of integration of their industrial, financial and intellectual capital to boost the quality of port infrastructure. Nowadays, the European Network of Maritime Clusters (ENMC) serves as such an integration tool; it was established in Paris in November 2005. The Network aim is to organize the exchange of experience among its members, coordinate various activities, as well as develop and strengthen marine clusters of the member states and of Europe as a whole [3]. At present, the ENMC includes marine cluster organizations of such countries as such as Belgium (Flanders Maritime Cluster), Bulgaria (Marine Cluster Bulgaria), Denmark (Maritime Development Center of Europe), Finland (Meriliitto), France (French Maritime Cluster), Germany (Bundesministerium für Wirtschaft und Technologie), Italy (Italian Maritime Cluster), Ireland (Irish Maritime and Energy Resource Cluster), the UK (Maritime UK), the Netherlands (Nederland Maritime Land), Sweden (Sjöfartsforum), Spain (Spanish Maritime Cluster), Portugal (Forum Oceano), Poland (Polski Klaster Morski), Norway (Maritimt Forum), and Iceland (Iceland Ocean Cluster).

As for infrastructure of the Ukraine's port industry, the 2000s marked the start of its rigorous development and technical re-equipment. However, the absence of special legislation had resulted in the critical condition of ports. On June 13, 2013, the Law of Ukraine «On Sea Ports of Ukraine» [4] came into force to regularize the legal, economic and organizational foundations of the port industry functioning. An important opportunity provided by this Law was the privatization of port infrastructure objects and development of private entrepreneurship in this sphere. As noted in [5], the commercial activity of ports, which had been historically state-regulated, became open to private entrepreneurs not only for a particular production cooperation, but also for complete privatization. The purpose of such transformations was to develop port competition able to provide a greater economic efficiency and meet the customers' needs to a fuller extent than one state enterprise [5, p. 25].

After the Law's adoption [4], the Ukrainian Sea Ports Authority (USPA) was established with regional branches in the seaports of Ukraine; it could be regarded as a state authority. The strategic property

of ports that is not subject to privatization has been transferred to the USPA; it includes approach channels, water areas, berths, navigation systems, and general communications. Meanwhile, other facilities with average wear of 80% (warehouses, cranes, and other equipment) make up the property of merchant seaports (one third) and private companies (two thirds). Such an imbalanced division of state property, powers and functions between the USPA and state-owned enterprises is subject to criticism [6, 7]. Since 2016, the Ministry of Infrastructure has planned a port industry reform which would «withdraw the state from all the spheres that have an impact on business», a drastic USPA reform, and creation of a maritime authority that will assume all the USPA responsibilities [8].

The term «port infrastructure» first appears in the Ukrainian Seaports Development Strategy until 2015 [9], which defines it as a specialized property complex including warehouses and storage yards, loading and unloading mechanisms and other property [9].

The above-mentioned Law «On Sea Ports of Ukraine» [4] defines the port infrastructure objects – mobile and immobile objects that ensure the operation of a seaport. Besides, it is the first document to provide description of the following categories:

- general-purpose port infrastructure objects: water area, railway and automobile approach roads (up to the first junction outside the port territory), communication lines, means of heating, gas, water and electricity supply, engineering communications, and other objects that ensure operation of two or more business entities in the seaport;
- strategic state-owned port infrastructure objects: hydrotechnical structures, general-purpose port infrastructure objects, navigation equipment, other objects providing navigational and hydrographic support of sea routes, vessel tracking management systems [4].

The Ukrainian Seaports Development Strategy until 2038 [10] is based on the principled understanding that competitiveness of the domestic transport complex in the world market depends a number of factors. They include the efficiency of operation of seaports, the level of their technological and technical equipment, and the compliance of the infrastructure management and development system with the current international requirements.

According to [11], port infrastructure quality is a five-dimensional notion consisting of the elements associated with resources, results, process, management, and the image and social responsibility. It has been established that this notion covers all aspects of port service provision. Besides internal services within the port, external connections between the port and its customers are also considered, social responsibility being

particularly significant with regard to the maritime sector [11]. Therefore, it is critical to improve the port infrastructure quality with the help of a comprehensive approach rather than merely focusing on port resources. The quality of port services has a substantial positive impact on customer satisfaction. It helps keeping the existing customers and attracting the potential ones, so it is not surprising that analysts associate the development of port infrastructure with investment of funds. When planning an investment, the USPA bets on the ports with a certain cargo traffic. At present, those are the highest-capacity ports in Odessa, Yuzhny, Mykolaiv, and Chornomorsk (see Table 4.11).

Table 4.11. Cargo turnover at domestic ports, mln tons*

	Yuzhny	Odessa	Mykolaiv	Chornomorsk	Total (13 ports)
2014	47.4	24.6	20.8	17.6	144.9
2015	48.5	25.3	22.2	17.3	144.6
2016	39.3	25.3	22.4	15.9	131.7
2017 (first half of year)	22.1	12.2	11.4	8.0	66.0
Share of grain cargoes in total cargo turnover	24%	42%	43%	50%	

* *Compiled by the authors according to [12]*

It should be noted that seaports are classified according to the major cargo nomenclature (see [10]). Currently, most potential investors are involved with the cargo traffic in the agricultural sector. According to the forecasts of analysts, the volume of grain export is going to increase, therefore, agribusiness holdings will invest in the growth of capacity of grain terminals.

Another area for improvement in the quality and competitiveness of port infrastructure is capital investment aimed at dredging channels or specific water areas and maintaining their depth. This is the case with the potential grain container port hub of Chornomorsk. The Ministry of Infrastructure of Ukraine, the State Enterprise «Marine Trade Port of Chornomorsk» and the USPA plan to invest in Terminal 2 over 2017-2018 for the following purposes: dredging of the approach channel of the port up to 16 m; dredging of the water area of the 1st basin of the Sukhyi Estuary up to 15 m; dredging near berths 7, 8, 9, which will allow accommodating vessels with up to 100000 tons of deadweight; reconstruction of the power supply system at berths 8, 9, which will provide for simultaneous operation of four or more cranes; continuation of two railways from berth 9 to berth 7 and 8, which will increase their carrying capacity [13]. By the way, the USPA has invested 887.2 mln UAH in the

infrastructure of the port of Yuzhny to dredge its water area from 15 m to 19 m, which resulted in receiving an additional income of 877.97 mln UAH due to the growth of cargo traffic and abolition of discounts [14]. The investment in the infrastructure project increased the port capacity, which allowed for the entry of 351 large-tonnage ships of the Sapesize class and their loading up to a complete draft at berths 5-6. During the project implementation, the growth of cargo turnover in the water area of the port of Yuzhny was 14.57 mln tons.

Particularly noteworthy is that the Seaports Development Strategy [10] focuses on the specialization of seaports by the major cargo nomenclature:

- oil and petroleum products – seaports of Odessa and Feodosia;
- chemical liquid cargo – seaport of Yuzhny;
- metallurgical industry cargo (iron ore, coal, ferrous metals) – seaports of Odessa, Mariupol, Chernomorsk, Kerch and Yuzhny;
- grain cargoes – seaports of Odessa, Chornomorsk, Mykolaiv and Kherson;
- container cargo – seaports of Odessa and Chornomorsk [10].

Accordingly, the Minister of Infrastructure V. Omelyan has highlighted the necessity of forming a hub (centered) model of seaports [8].

By the term «hub port», we mean the main seaport strategically feasible in terms of transport infrastructure and logistics functions that performs the entire complex of port services determines by international competition and development of new technologies. Thus, the task of forming competitive hubs on the basis of the Ukrainian maritime complex and their integration into the world's port system is extremely urgent nowadays. This fact sets the following priorities in improvement of the seaport infrastructure quality in Ukraine [10]:

- increase of cargo handling rate, efficiency, and quality;
- modernization and development of general-purpose port infrastructure objects, in particular, automobile and railway approach roads;
- effective state regulation of specialized seaport services provided by natural monopolies and services covered by the port dues;
- improvement of the document management system, simplification of permit procedures, reduction of cargo handling time;
- provision of equal, competitive conditions for conducting business and receiving services at a seaport;
- coordination of actions on congestion and increase of load capacity at seaports.

In our opinion, further development in this sphere (that is, creation of a marine transport hub on the basis of a seaport) will create the necessary prerequisites for its transformation into a marine cluster. In turn,

this will allow exploiting the potential of port infrastructure facilities to a full extent, thus leading to an increase in the competitiveness of both the port and the respective region.

Summarizing all the above, it can be concluded that elaboration of basic directions for further development of the port infrastructure requires a study of appropriate foreign experience. Let us consider the present-day means of enhancement of the port infrastructure quality in other countries (Table 4.12).

Thus, having studied the experience of EU countries, it should be noted that the quality of the Ukrainian port infrastructure can be improved through transition from centralized management, planning, and instruction to their regional organization and local development tools. This is proved by the fact that the territorial dimension is diversified from geographical, economic, administrative and institutional points of view. Port infrastructure at the local level at the same time can be an integral part of the regional, national, European and international levels.

Table 4.12. Means of improving the port infrastructure quality in European countries*

Name	*Aim*	*Results* (as illustrated by some ports)
Cluster Pôle Mer Bretagne Atlantique (established in 2005 in France)	Establishment of joint research projects and support for the growth of participating companies, particularly through the placement of new products, services and processes resulting from market research	Seaside region of France – Bretagne-Pays de la Loire Maintaining their identity and integrating into the human and geographical environment, port cities are truly laboratories of sustainable development in densely populated urban areas. Port infrastructure should perform its functions for a long period of its operation. Therefore, the main objective of the I-MARECO project is high performance and life cycle of the port infrastructure. I-MARECO aims at developing a common expenditure strategy for the maritime infrastructure through the creation of surveillance systems (multisensory devices) that will eventually optimize management and performance, as well as facilitate feedback. Other ongoing projects include: AIMS – integrated noise monitoring of the marine environment; COVASED – a platform for management of earth sediments and development of their economic potential; OPTIMISME – development of global energy flow management in the port zone; SEEWALL – monitoring of marine protection works with the use of seismic listening; WATCHDOG – an autonomous intelligent robot for underwater diving

Table 4.12. Continuation

Name	*Aim*	*Results* (as illustrated by some ports)
TEN-T (Trans-European Transport Network) (founded in January 2014)	Elimination of bottlenecks and technical barriers among transport networks of the EU member states; strengthening of the social, economic and territorial cohesion of the European Union; modernization of existing infrastructures and platforms	Recognition of the NAPA ports (five seaports in the northern part of the Adriatic Sea) as the main ports of the EU in the TEN-T, successful cooperation within the framework of the Motorways of the Sea (MoS) projects and IT support projects, such as customs clearance of containers (Single Window and EDI Center), and successful participation in several international exhibitions in Europe and Asia
EcoPorts Network (launched by a number of active ports in 1997; fully integrated into the European Sea Ports Organization (ESPO) since 2011)	Elimination of all negative environmental impacts resulting from various activities, such as shipyards, fishing sector, maritime transport and the city as a whole	Port of Vigo (Spain) Taking action against climate change, introduction of LNG and OPS, reduction in carbon emissions, incorporation of marine renewable energy sources into the port activities, creation of the National Park of the Islands Cíes. It is planned to develop an infrastructure for gas and electricity supply to vessels. Port of Dover (United Kingdom) Receiving CEEQUAL Award for the environmental quality of the port infrastructure construction, reduction in carbon emissions, implementation of marine renewable energy sources in the port activities, improvement of the waste management system. Port of Thessaloniki (Greece) The relations with the city became more transparent. Major environmental pressures that arose due to the port operation have identified relevant environmental programs and indicators for improving the port's environmental efficiency. It is planned to perform special works on optimization the bulk cargo processing, which will sharply reduce air pollution with dust

***** *Compiled by the authors according to [15, 16, 17]*

Conclusion. Improvement of the port services quality constitutes a promising direction of port infrastructure development, which is determined by international competition and state-of-art technologies forming new requirements for the safety, rate and quality of cargo handling at the port. Therefore, the following priorities of innovation management at the development of domestic seaport infrastructure can be outlined.

1. Using both state subsidies/loans and private funds through attracting substantial domestic and foreign investment. For several years, it has been planned to conduct a concession in the Ukrainian ports, that is,

to transfer a part of their facilities for temporary use to private individuals, enterprises, other countries, etc. This will promote restoration and development of the infrastructure without allocating huge sums from the state budget.

2. Besides infrastructure and equipment, an effective seaport requires effective management. For domestic ports, the state administration reform, the transfer of centralized management to the regional level, and the creation of regional maritime authorities to provide high-quality port services all make up an urgent necessity. At that, involvement of local authorities in the management of port enterprises is also essential.

3. Solving environmental problems of seaports. Some ports are highly industrial; depending on cargo volume and placement, they can have an impact on the water and air quality and, accordingly, on the health of the population. This year, European countries celebrated the twelfth anniversary of the Green Port Policy, which requires an effective environmental management system. Each domestic port can develop plans for managing waste from ships and daily port operations or models for implementing the Green Port concept. They will be aimed at achieving a low level of natural resource consumption. However, this cannot be realized without effective cooperation between public authorities and private companies. It will ultimately lead to a boost in the quality of seaports services, thus positioning them as competitive in international markets.

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Section 5

Innovative marketing as a tool for economic growth

5.1. Factor model for assessing the effectiveness of innovation market

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The effectiveness of innovation market functioning is the main regulator of innovation development of the country and of the formation of its innovative infrastructure. The current state and prospects of the development of the innovation market determine the possibilities of a fuller use of the country's scientific, technical and educational potential, and the revival of its innovative infrastructure. Innovation potential of the country is characterized by the willingness of the society and economy to introduce new technological and social changes under the influence of internal and external factors. The economy of the country is concerned both with the negative effects of the global financial and economic crisis and recent social and political problems. The stabilization and adaptation of the national innovation system and its innovation market in changing realities is of the highest scientific and practical significance. The effectiveness of the market mechanisms for managing innovation and the increase of the innovation activity of enterprises directly depends on the activity of supply and demand in the market of innovative products; therefore, ensuring the effective functioning of innovation infrastructure should begin with the development of the innovation market itself.

A considerable number of scientific works have been devoted to the research of the problems of formation and development of innovation infrastructure and its main component – the innovation market. These issues were actively researched in the works of such foreign scholars as I. Goriacheva [1], D. Dorzhiev [2], N. Ivanov [4], N. Kalenska [5], V. Tribushna [11], R. Chobanova [13], T. Sherstobytova [14], J. Schumpeter [16] and others. Different aspects of this issue were studied in the works of a number of Ukrainian economists, such as S. Illiashenko [3], M. Kanaieva [6], V. Soloviov [9], L. Fedulova [12], T. Shotik [15], I. Yanenkova [17] and many others.

Constant social and economic changes in the country and in the world put to scientists and business representatives a number of issues related to the need for adjustments, accounting of the dynamics of these changes

and their impact on the innovation infrastructure, the specificity of the development of the domestic innovation market. The question of the composition and formation of the modern market of innovations is complex and multidimensional; therefore, despite a significant number of scientific works, it requires further research.

The country's exit from the crisis and economic growth are impossible without a widespread use of the achievements of science and technology and introduction into production fundamentally new ideas, technologies, innovative products and services. Intellectual work is becoming more and more important and operates as the main factor; it is the imperative of realizing the concept of knowledge economy of postindustrial society. Knowledge-oriented economy, as the most productive power of the present day, needs to be stimulated and supported concerning both the direct producers of this driving force – scientists, researchers, and inventors of new ideas, proposals, innovation projects, and entrepreneurs who directly transform these ideas into innovations products, goods, and services.

As the results of a number of studies prove [14, p. 21], on average for 100 successful innovations about 75 appear in response to consumer needs, and only 25 appear as a result of the introduction of new ideas that arise in the course of the scientific research and development and constructor works (SRDCW).

The results of research and creative activity act as an intellectual product. Incorporated into an invention, discovery, scientific reports, patents, innovative projects, innovative proposals, intellectual product becomes a commodity in the market of innovations and acts as a part of the country's innovation infrastructure.

Innovative infrastructure is considered as a dynamic self-regulatory system of markets and entities entering in these markets into certain economic relations within the limits stipulated by laws and normative and legal acts of Ukraine and providing the creation of the necessary conditions for the expanded production of innovative products, technologies, and services [8, p. 56].

The main goal of the formation and functioning of the country's innovation infrastructure is the provision of comprehensive innovation activities, preservation and development of the country's scientific and technological potential in the interests of the society, including overcoming the decline of production, its structural adjustment, changing the nomenclature of products, creating new products and new production processes.

The innovation market creates demand and defines the supply of intellectual property products. Commodity-money relations in the market

of innovations arise from the moment of fixing scientific and technical ideas, proposals, know-how, SRDCW as objects of intellectual property, patents, innovative projects, drawings, technologies, the use of which, in accordance with the current legislation, is allowed only by committing a market act of sale. As the seller in this market, the owner of the intellectual product is officially registered, and the buyer is an enterprise interested in the practical implementation of this product as an innovative product. Both the buyer and the seller act in order to obtain a certain economic effect for themselves. An aggregate of regular sales relations between manufacturers of innovative goods and their consumers determines the emergence of an innovation market.

The market of innovations, like any other market, is an economic system, in which the coordination and realization of economic interests between sellers and buyers through the mechanism of market prices takes place. It refers to one of the specialized types of markets.

The conditions for effective functioning of the market of innovations are a mechanism of competition, which is provided by a wide range of proposals of innovative ideas and projects, and the freedom to choose a partner in economic affairs; the balance of supply and demand; the creation of the developed innovation-market infrastructure.

In addition, the specificity of the innovation market lies in the fact that the value and price of innovations on it are formed under the influence of the economic resultant interaction of factors of particular production, not only the magnitude of aggregate demand and supply [1]. That is, the demand and supply in the market of innovations are not the main price defining factors. Everything depends on the economic factors of a particular production. This definition refers to the specifics of the innovation market exclusively.

In the market of innovative services as an integral part of the innovation infrastructure, there is a clear dependence due to the peculiarities of the process of production of these services, as well as the specifics of the object of purchase.

The peculiarity of the process of manufacturing innovative services is the fact that it can be divided into two stages. The first stage is intellectual and the second is material production. Then, the consideration of innovation infrastructure as a market for innovative services implies its delineation in the processes of providing intellectual and material services.

The innovation market is the set of organizational and economic relations that arise in the process of exchanging the results of innovation activities and coordinating the interests of participants concerning prices, terms and scales of this exchange.

Therefore, the innovation market is the set of innovative types of products and processes, legal entities and individuals who sell or purchase scientific and technical science-intensive products. As a specific sphere of sale, the market of innovations determines as the object of trade technical and socio-economic innovations, rationalization proposals, inventions, patents, technological innovations, and know-how. As a system of economic relations, it is aimed at the development, implementation and diffusion of innovations at various levels.

At the stage of the gradual overcoming the economic crisis, the creation of favorable conditions for the fuller realization of the creative and inventive potential of the Ukrainian society is gaining special significance in the innovative market of the country. The susceptibility of the national economy to innovation depends largely on the presence of demand for innovative products from consumers in the market, the acceleration of the dissemination of advanced technologies, including the expansion of the range of innovative active firms in the medium business, the creation of new innovative firms and the dynamic growth of their scale.

Communication factors play a key role in the dissemination of new scientific and technical products. The high level of information exchange and close communication contribute to the rapid diffusion of innovations. Active participation in scientific and technical seminars, symposiums, exhibitions provides the acquaintance of the consumer with new products before they are brought to the market, thus forming an innovative demand. In the absence of preliminary information about a new product, the consumer can perceive its appearance on the market in the alerted way and the process of formation of demand will be too long, which in turn will affect the costs and financial results of the firm.

The current state of the markets for innovative services in Ukraine and the peculiarities of their further development are determined by the following factors:

1) the need to further expand the number of subjects and objects of innovation infrastructure and to increase the volume and quality of their services;

2) the problems of economic development and the scarcity of state and local budgets make impossible the optimal financial support of subjects and objects of innovation infrastructure;

3) the possibility of establishing effective functioning on a commercial basis of service facilities in the structure of innovation infrastructure;

4) the formation of the innovation infrastructure is objectively conditioned by the growth of the needs of the subjects of innovation in the services provided and the level of the development of the national

scientific and technical sphere, the availability of scientific and technical developments that can subsequently be commercialized;

5) further development of the country's innovation infrastructure is possible on the basis of the processes of softening and deepening the service model of the actions of its subjects.

The model of innovation infrastructure functioning, consisting of a certain number of innovation markets, is presented in Fig. 5.1.

In the process of studying the real state of the markets for innovation infrastructure, we used the deterministic modeling and transformation of factor systems. One of the tasks of factor analysis is modeling the relationship between the performance indicators and factors that determine their magnitude. The results can be factorized into constituent elements (factors) in different ways and presented in the form of various types of deterministic models.

The state of the markets for innovation infrastructure is influenced by both external and internal factors. To external influence, we refer the crisis state of the economy, the development of the processes of technologies transfer and outsourcing, other factors of the international level. Internal factors are represented by political, economic, scientific and technical, production and financial peculiarities of the country's development (Fig. 5.1). Let us consider in more detail their purpose and principles of formation. The market of intellectual property objects. In the market economy of a post-industrial society, national wealth is determined not only by the total volume of material resources of the country, but also by the knowledge, values obtained in the process of intellectual work of scientists, inventors, researchers.

Intelligent labor is, without exaggeration, the highest form of human activity associated with the knowledge of the surrounding reality, which begins with the hypothesis or assumption and finishes with obtaining the result in the form of ideas, inventions, discoveries, new knowledge, etc. At the same time, receiving an innovative, useful intellectual product is probabilistic and can be both positive and negative.

The most significant and promising inventions, innovative proposals, know-how, results of intellectual work, which are officially legally registered as objects of intellectual property, become a market commodity. Intellectual property is an intangible object and intangible resource. Their author, which is a scientist, inventor, researcher, or even a whole research organization is the creator of the intellectual property object and receives the exclusive right to use it, and acts as a seller on the market of intellectual property objects. On the other hand, natural and legal persons, who wish to get the right to use these objects in their production activities, act as buyers of intellectual property objects. Mutually beneficial

commercialization of intellectual products takes place in the process of selling patents, licenses and other objects of intellectual property to interested persons, direct producers of innovative products, goods, and services.

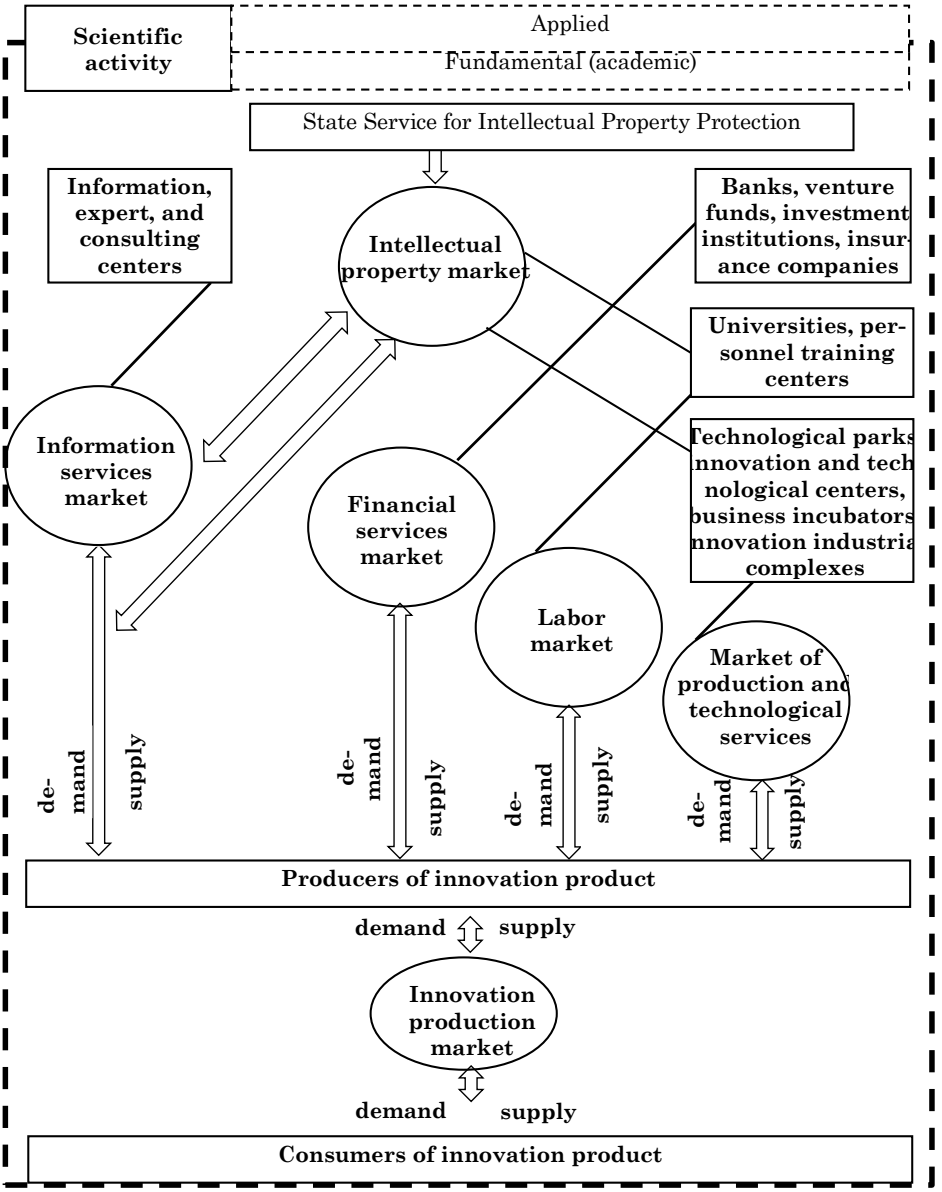

Figure 5.1. The model of country's innovation infrastructure functioning
Source: author's development

In the conditions of the globalization of the world economy, the acquisition and commercial use of intellectual property objects becomes an important factor for the successful use of innovative ideas and the dissemination of new technologies. It facilitates the development of market-based relationships between science and production, licensing trade, technology transfer, and the formation of the market for intellectual property objects. The greatest demand is the technology of manufacturing new types of high-tech products (highly specialized technological installations, pharmaceuticals, newest technology and techniques, etc.)

On the effectiveness of the operation of the national market of intellectual property objects, one can draw conclusions on the ratio of the intellectual property represented in the sale of goods in the form of patents, licenses, innovational offers, know-how and the number of similar goods purchased and used by producers for the production of innovative products, goods, and services.

In order to increase the level of intellectual and innovative potential of the country, it is necessary to intensify the activities of the intellectual property market, to increase the prestige and payment of intellectual labor.

The market of information services. Another market in innovative infrastructure, which works in close cooperation and in parallel with the market of intellectual property, is the market for information and expert-consulting services. On this market, the information on the emergence of new scientific and innovative ideas, proposals, developments operates as a commodity; this market offers expert analysis services and the search for the most promising ideas, as well as consulting services for innovative business planning. Communication in the information services market is often interactive. The structure and content of the information market products are varied and extremely changeable.

The essence of the information services market can be defined as the set of economic, legal and social relations that arise in the process of meeting the information needs of producers who wish to set up the production of innovative products, new products, and services and are willing to pay for this information an affordable price.

The rapid growth and expansion of the demand for scientific, technical, and economic information, as well as the increased requirements for the content and forms of presentation of information, are the incentives for the development of the market of information and consulting services in the country's innovation infrastructure.

Ukraine is taking the first steps towards entering the innovative services market on the international level as an outsourcer for Western countries. So, in 2015, the rating «The 2015 Global Outsourcing 100»

included four Ukrainian companies engaged in IT outsourcing: *Eleks*, *Miratech*, *Softengi* and *SoftServe*. In addition, the rating noted foreign companies, which have opened large offices in Ukraine: worldwide *Luxoft*, Belarusian *Intectics*, American *TEAM International Services* and *Softjourn*. All this has a positive effect on improving the image of Ukraine on the global IT market and enhancing its information services.

The market of financial services. One of the most important problems for the country's leadership in the face of a sharp shortage of financial resources is the question of how much and what funds should be allocated for academic research, applied research and innovation. In addition, part of public funds need to be allocated among the subjects of innovation infrastructure to support and intensify their activities. The main receivers, for which the innovation infrastructure of the country is created, are innovative active production enterprises, which transform scientific ideas into the benefit and material goods. The current financial situation of most domestic enterprises does not allow allocating as much funds as it is necessary for the purchase of new technologies, for upgrading production equipment, and training highly skilled personnel. The volume of the state budget is always limited. The difficulty in deciding on the financing of innovation production is that, above all, that in most cases such investments cannot give a quick return. In addition, investing in research and development, and the organization of innovation production always serve as long-term, strategic decisions that have to be taken considering the overall innovation policy of the state.

The mandatory part of state financing of the subjects of innovation infrastructure includes, first of all, financing of the development of fundamental (academic) science.

The costs of applied scientific and technical research and design work, research and experimental development, technology and production and technical development of the production of new products can be financed both at the expense of the state budget and at the expense of other sources. Such sources of funding may become:

- bank and innovation credits;
- the issue of securities;
- the use of venture capital;
- self-financing;
- financing of an innovative project from the income received in the process of implementing short-term projects;
- leasing of temporarily free assets;
- provision of the property of the enterprise on the security of received funds;
- sale of licenses for the use of innovative technologies and know-how;

- outsourcing in innovation activity as a method of attracting foreign investment;
- state incentives, the creation of privileged conditions for external and internal investment in innovation and new technologies.

The expansion and maximum possible use of all potential sources of financing is a priority task for the development of the financial services market.

The labor market in the structure of innovation infrastructure acts as the regulator of social and economic and labor relations between the state, the employer and employees on the issues of hiring, use, training and retraining, and the improvement of the skills of the workforce in the process of innovation production. Innovations in modern technology and systematic updating of manufactured products raise the requirements to the quality of labor resources training and cause the need for continuous training and retraining of personnel. In many regions of the country, there is a shortage of highly skilled specialists, especially managers who have the experience in innovation entrepreneurship.

The labor market is entirely dependent on the state of the national economy and the level of unemployment. In 2005-2007, Ukraine's economy was growing, specialists were in deficit, and they dictated their employment conditions to the employers. The state of the labor market has changed dramatically because of recent social, political, and military events in Ukraine. The number of vacancies has decreased by almost 20%; the number of migrant workers (internally displaced) in the country is increasing constantly and the unemployment is rising.

The outsourcing of HR services from large international companies can be promising for the national innovation system, as it will contribute to the harmonization of the labor market and the social interests of Ukrainian society.

The market for manufacturing and technological services includes services and opportunities provided by innovative enterprises, technological parks, innovation technology centers, innovation and industrial complexes, as well as the centers for the transfer of technologies, centers for the collective use of high-tech equipment. The need to create a market for industrial and technological services in the field of innovation production is determined by the needs of the enterprises in obtaining technical and technological assistance, in providing them with production space and equipment necessary for the successful implementation of innovative projects. Accompanying support may also be related to the preliminary preparation of material resources, the implementation of resource and energy saving technologies, the provision of innovative products of complete market readiness.

In Ukraine, over the past decades, there has been a decline in industrial production. The fall of industrial production, and especially of high-tech manufacturing industries, leads to the degradation and destruction of the national economy and gradual de-industrialization of the national economy. The main production facilities are worn out by 50-60%; new equipment is not installed due to insufficient funding. Acquiring new technologies and improving the quality of products are very slow, which adversely affects the competitiveness of goods in the world market.

One of the ways to solve the problems of the manufacturing and technological sector can be the creation of outsourcing companies with large foreign manufacturers of innovative products. Outsourcing of production space, equipment, technology and labor is widely used in many countries around the world. In modern conditions, it is a universally recognized and one of the most effective methods for the development of innovative entrepreneurial activity.

For Ukraine, outsourcing from leading global companies is an opportunity to attract foreign investors. Ukraine can become a wonderful platform for the construction of buildings and production facilities of foreign corporations, which produce cars, electronic high-tech equipment and devices. All this, ultimately, will open up wide opportunities for restructuring and innovation of the national industry.

The market of ready-made innovative products. The low demand for ready-made innovative products inside and outside the country is the main reason for the weak development of the market for innovative products. This is due to the low solvency of enterprises where this product could be used, as well as the lack of information, the lack of advertising about the opportunities and quality of new products, the lack of promoting innovative products in the markets.

Of great importance for solving this problem is the optimization of the combination of a market mechanism with state regulation. State regulation of the market for innovative products can be carried out with both direct and indirect methods, which include economic, informational, legislative, and administrative components.

The factor model of the estimation of the external and internal environment and the degree of its influence on the formation of the innovation infrastructure in Ukraine is the matrix of evaluation criteria, which indicates the actual state of the research object (Table 5.1).

It takes into account the weight and assessment of the current state of Ukraine's innovation infrastructure. The results are based on expert judgment. As a result of the study of the environment for the formation of innovation infrastructure, we have received the assessment of the

actual state of each of the operating factors – 38 points out of 270 possible, which is 14.08% of the maximum value.

Table 5.1. Factor model for assessing external and internal environment and the degree of their influence on the formation of innovation infrastructure in Ukraine

№	Factors and the degree of their positive or negative influence: 0 – no influence; 1 – weak influence; 2 – medium influence; 3 – strong influence	Innovation infrastructure markets						The total actual (maximum possible) estimate of the impact of each of the operating factors in grades
		Intellectual property	Information services	Financial services	Labor	Production and technological services	Innovation products	
	External factors							
1.	Crisis condition of world economy	0	-1	-2	+2	+1	-2	-2
2.	Tensions in international relations	0	0	-1	+1	0	-1	-1
3.	International transfer of technologies and outsourcing	+2	+3	+3	+2	+3	+2	+15
4.	Membership in European Union and WTO	+1	+3	+3	+2	+2	+3	+14
	Internal factors							
5.	Unstable social and political situation	-2	-2	-3	-2	-2	-3	-14
6.	Modern condition of economy	-1	-2	-3	-1	-2	-2	-11
7.	State innovation policy	+3	+2	+2	+2	+3	+2	+14
8.	Provision of state financing	+1	0	+1	+1	0	0	+3
9.	Scientific and technological potential of the country	+3	+2	+1	+1	+2	+2	+11
10.	Education and training of personnel	+3	+2	0	+3	+2	+2	+12
11.	Availability of material resources	0	+1	+1	0	+2	+3	+7
12.	Availability of fuel and energy resources	-1	-2	-2	0	-2	-2	-9
13.	Modern condition of equipment and technologies	-2	-2	0	-1	-2	-3	-10
14.	Innovation potential of entrepreneurship	0	+1	+1	+1	+1	+1	+5
15.	The attitude of the society to the innovations	+1	+1	0	+1	+1	0	+4
Aggregate evaluation of all influencing factors on each innovation infrastructure market in grades		+8	+6	+1	+12	+9	+2	+38 (+270)

Source: author's development

Determining the factors that influence the efficiency of the Ukrainian innovation infrastructure has allowed us to form a system of criteria and indicators for conducting correlation-regression analysis. We have systematized these indicators based on the principle of complex characteristics of all components of the innovation market as part of the innovation infrastructure of the country (Tables 5.2-5.3). The statistical data was systematized according to the selected groups; correlation-regression analysis was carried out and correlation coefficients were calculated – paired and general. The calculation of correlation indicators was carried out using the analytical package Microsoft Excel [7, p. 219].

Among the obtained indicators, we conduct the selection based on the principle of the highest correlation with the result indicator – the volume of the implemented innovative products and a minimum correlation with each other. The most important results of the assessment of the factors of the country's innovation infrastructure are:

N5 – the number of executed scientific and technical researches;

I2 – the number of the received security documents on the results of fundamental research;

I3 – the number of the received security documents on the results of applied research;

K1 – the capacity of the consulting services market;

F1 – total amount of innovation activity financing;

G1 – the number of enterprises that were mastering the production of the innovative types of products.

With the selected indicators (Table 5.2), we perform regression analysis and determine the coefficients of the equation (formula 5.1):

$$y = 1{,}957636 \cdot x_1 + 60{,}48499 \cdot x_2 - 26{,}1292 \cdot x_3 + 0 \cdot x_4 - 0{,}23786 \cdot x_5 + 0 \cdot x_6 = 1{,}957636 \cdot x_1 + 60{,}48499 \cdot x_2 - 26{,}1292 \cdot x_3 - 0{,}23786 \cdot x_5 , \quad (5.1)$$

where y – the volume of the realized innovative products, million UAH; x_1 – the number of executed scientific and technical researches, thousand units; x_2 – the number of the received security documents on the results of fundamental research, units; x_3 – the number of the received security documents on the results of applied research, units; x_4 – the capacity of the consulting services market, million USD; x_5 – total amount of innovation activity financing, million UAH; x_6 – the number of enterprises that were mastering the production of the innovative types of products, units.

The values of the number of the received security documents based on the results of fundamental research have the highest level of

influence on the resulting indicator. That is, with an increase in the number of the received security documents based on the results of fundamental researches by one unit, the volume of the realized innovative products will increase on average by 60.485 million UAH. With an increase in the number of the received security documents on the results of applied research by one unit, the volume of the realized innovative products increases by 1.958 million UAH. The constructed model provides an opportunity to predict the state of innovation infrastructure in the future, for this, it is necessary to identify the trends of its factors development.

Table 5.2. Indicators for assessing the effectiveness of the country's innovation infrastructure

<table>
<tr><td colspan="5">Innovation markets</td></tr>
<tr><td>The market of innovation scientific and technical proposals, concepts</td><td>Intellectual property market</td><td>Information services market</td><td>Financial services market</td><td>The market of ready innovation product</td></tr>
<tr><td>Number of organizations carrying out scientific and technical activity (N_1)</td><td>Number of received security documents for inventions (I_1)</td><td>The capacity of the consulting services market (K_1)</td><td>Total amount of innovation activity financing (F_1)</td><td>Number of enterprises that were mastering the production of innovative products (G_1)</td></tr>
<tr><td>The number of employees of the organizations that carry out scientific and technical activities (N_2)</td><td>Number of received security documents based on the results of fundamental research (I_2)</td><td rowspan="4"></td><td rowspan="4"></td><td>Number of new technologies, which were bought by industrial enterprises (G_2)</td></tr>
<tr><td>Financing of the scientific sphere (N_3)</td><td rowspan="2">Number of received security documents based on the results of applied research (I_3)</td><td rowspan="3">Innovation production (G_3)</td></tr>
<tr><td>Budget financing of research and development activities (N_4)</td></tr>
<tr><td>The number of executed scientific and technical researches (N_5)</td><td rowspan="3"></td></tr>
<tr><td>Budget financing of fundamental research (N_6)</td><td>Total amount of innovation expenses in industry (G_4)</td></tr>
<tr><td>Budget financing of applied research (N_7)</td><td></td></tr>
</table>

Source: author's development

Table 5.3. The system of indicators for finding the dependence of the volume of the realized innovative products on the efficiency of innovation market functioning within the innovation infrastructure of Ukraine

Indicators	Symbols	Years				
		2010	2011	2012	2013	2014
The volume of the realized innovation product, million UAH	Y	33697,6	42386,7	36157,7	35891,6	25669,0
The market of innovation scientific and technical proposals, concepts (SRDCW)						
Number of organizations carrying out scientific and technical activity, units	N_1	1303	1255	1208	1143	999
The number of employees of the organizations that carry out scientific and technical activities, thousand people	N_2	141,1	134,7	129,9	123,2	109,6
Financing of the scientific sphere, million UAH	N_3	4640,57	5126,81	6126,87	5962,16	5278,52
Budget financing of research and development activities, million UAH	N_4	4223,05	4594,07	5450,56	5347,79	4728,91
The number of executed scientific and technical researches, thousand units	N_5	52,0	52,3	52,3	47,9	43,0
Budget financing of fundamental research, million UAH	N_6	2403,80	2564,03	3020,84	3023,83	2795,13
Budget financing of applied research, million UAH	N_7	1595,62	1746,40	2126,37	2065,82	1823,69
Intellectual property market						
Number of received security documents for inventions, units	I_1	1991	2703	2743	2786	2270
Number of received security documents based on the results of fundamental research, units	I_2	1280	1948	2220	1715	1721
Number of received security documents based on the results of applied research, units	I_3	2546	3725	4619	3148	3203
Information services market						
The capacity of the consulting services market, million USD	$К_1$	300	337	392	445	490
Financial services market						
Total amount of innovation activity financing, million UAH	F_1	8045,5	14334	11481	9562,6	7695,9

Table 5.3. Continuation

Indicators	Symbols	Years				
		2010	2011	2012	2013	2014
The volume of the realized innovation product, million UAH	Y	33697,6	42386,7	36157,7	35891,6	25669,0
The market of ready innovation product						
Number of enterprises that were mastering the production of innovative products, units	G_1	615	731	704	683	600
Number of new technologies, which were bought by industrial enterprises, units	G_2	707	872	739	651	543
Innovation production, number of positions	G_3	2408	3238	3403	3138	3661
Total amount of innovation expenses in industry, million UAH	G_4	8045,5	14333,9	11480,6	9562,6	7695,9

Source: developed by the author based on statistic data [10]

At the stage of the gradual overcoming the economic crisis, the creation of favorable conditions for the fuller realization of the creative and inventive potential of the Ukrainian society is gaining special significance in the innovative market of the country. The susceptibility of the national economy to innovation depends largely on the presence of demand for innovative products from consumers in the market, the acceleration of the dissemination of advanced technologies, including the expansion of the range of innovative active firms in the medium business, the creation of new innovative firms and the dynamic growth of their scale.

The strategy of innovation development is aimed at the formation and functioning of a specific infrastructure to increase the acceptability of the business environment to innovation. Significant activation of the market of innovations cannot be carried out without addressing, as necessary, certain markets for innovative services operating in the innovation infrastructure of the country, the economy, etc.

The formation of self-sufficient and well-functioning innovative Ukrainian infrastructure, which is self-organized, is necessary not only for the harmonization of the functioning of the innovation system and national economy, but also for the survival of the country. Despite the complexity and ambiguity of the influence of external and internal factors on the establishment and development of innovation infrastructure, the overall positive assessment suggests that, with certain efforts on the part of the state and business, Ukraine's innovative infrastructure can effectively develop and carry out its functions.

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5.2. The problems of development of an effective management system of internal communications and ways to overcome them

Melnyk Yu.M., Sager L.Yu., Niño-Amézquita J.

The communication process at each of its stages can undergo certain distortions that negatively affect the overall effectiveness of information exchange, which, in its turn, leads to a decrease in the management effectiveness of the enterprise activity as a whole. Thus, according to the research [5], more than 80% of errors in business processes are due to the absence of necessary information in necessary place.

So, at all stages of the enterprise activity there are many obstacles on the way of effective communications. They can be of interpersonal nature (individual perception and interpretation of the message content, limited information capacity of perception (short-term memory); inability to listen to another person, etc.), as well as various organizational, technical and other barriers (message distortion, information overload of the existing communication system, etc.) (Table 5.4) of different degrees of complexity for overcoming.

Many researchers distinguish different causes of inefficient communication. So, for a detailed consideration of communication problems M.Kh. Meskon, F. Albert and M. Khedoury [4] proposed a cyclic model

that allowed investigating of various types of problems in communications, based on the structure of models and the connections between its elements.

Based on the elemental composition of the model, we can distinguish the following groups of obstacles:

1) groups related to communicator or communicant. The authors distinguish three main types of communication problems: biological, psychological, sociological;

2) groups related to message: problem of message style, its language dictionary and the possibility of unambiguous interpretation;

3) encoding (decoding) the message and response (problems of identity searching);

4) direct communication channel and feedback.

According to Osovska G.V. [6], the significant obstacles to effective communications establishing include: the authoritarian attitude of the administration towards subordinates, the vagueness or reluctance of managers to perform their duties, the lack of healthy atmosphere in the development of business policy and motivation for communication among employees, incorrect determining of rights and responsibilities, the fear of managers and subordinates for the consequences of the transfer of forthright information, etc., as well as a number of subjective factors that reduce the effectiveness of contacts between individual employees: different interpretations of concepts, different level of knowledge, different emotional state, etc.

As a result, the author determines the following main types of communication obstacles:

1) competition between messages (in situations when the recipient is simultaneously impacted by several sources of information, the recipient prefers the message, which is the most important for him at the moment);

2) perception of the message by the recipient;

3) language, logic, abstraction;

4) the status of the person sending the message;

5) resistance to change.

Table 5.4. Obstacles to effective communication

Subsystem of IC	Subsystem element	Obstacles		
		Controlled	Partially controlled	Uncontrolled
Organizational	Managerial technologies	– problem of the message address targeting; – the absence of healthy atmosphere in the development of business policy and motivation for communication between employees; – analysis by the recipient of the message from other perspective than the sender, as a result of the replacement of some concepts by others because of their fuzzy definition	– authoritarian attitude of the administration towards subordinates; – discrepancy between the way of information transfer and its perception	
	Organizational structure of management	– inefficiency of the organizational structure; – increasing the probability of distortion of information with the growth of the vertical power structure; – inefficient way of work organization and task distribution; – incorrect determining of rights and responsibilities	– conflicts between units and between individuals	
	Personnel	– incompetence of workers; – communicative, professional and methodological incompetence of personnel	– inaccurate performance or reluctance of managers to perform their duties; – fear of managers and subordinates for the consequences of the transfer of forthright information	
Social and psychological	Social interaction	– psychological incompatibility of persons participating in the communication process; – inaccuracy in the interpretation of the meaning of words, gestures, intonation, facial expressions, etc.	– inability to listen to another person; – propensity to correlate one's reaction to messages with the reaction of other individuals	– the instinctive feeling of protest against imposing somebody's will
	Roles in management system	– the recipient desire that consists in fact that a message should be received by someone else – obstacles to adaption	– different needs, interests, gathered experience – prejudiced attitude of both contractors of communication to the discussion topic and given arguments; – psychological state of mind of the information sender about the recipient and vice versa	

Table 5.4. Continuation

Subsystem of IC	Subsystem element	Obstacles		
		Controlled	Partially controlled	Uncontrolled
Social and psychological	Psychological features	– limitedness of information capacity of perception	– individual perception and interpretation of the message content; – different emotional state	– the inherent qualities of a person to exaggerate what concerns himself and reduce what concerns others
Information	Communication channels	– a large number of directions for information obtaining;	– distortion of the message content;	
	Networks	– competition between messages (simultaneous impact on the recipient by several information sources); codification – the loss of part of the message while encoding and decoding of the message; – difficulties in receiving the feedback;	– information overload; – the excess of the real information processing capabilities of the communication system and people, who belong to it;	
Technical and technological	Software	– the obsolete software of information and communication systems; – incomplete use of the functions of information and communication systems;	– vulnerability of communication systems;	– high cost of modern information and communication systems
	Hardware	– the obsolete systems of data-storage and data transfer;	– failures in the equipment operation;	
	Information processing system	– simplifying of information that reduces the number of meaningful ideas, reduces the connection with the message context;	– imperfect processing algorithms regarding unstructured problems;	

Frolov S.S. [9] determines two groups of communication problems in the organization:

1) problems of structural communications connected with the barriers that arise in the process of information transfer, when the functions of each unit are not clearly and unambiguously defined;

2) problems of interpersonal communication connected with behavioral aspects of the organization activity.

At the same time, the author does not take into account that there are barriers connected with the process of information transfer as well as with interpersonal communications (the excess of the real information processing capabilities of the communication system and people, who belong to it; difficulties in feedback receiving; simplified information; competition between messages; a large number of directions for information obtaining, etc.)

Syrotyna K.V. [8] suggests a similar approach, adding the problems connected with a lack of understanding between employees of different units to the structural and interpersonal communication problems. The author also gives the causes for these obstacles.

Shepel V.M. [3] distinguishes six types of communication problems:

1) discomfort of the physical environment, where the message is perceived;

2) concern of the listener with other problems;

3) antipathy to other people's opinions, stereotyping of consciousness, ambitiousness;

4) language barrier;

5) professional rejection: incompetent intrusion of the communicator into the professional sphere of the communicant;

6) rejection of the communicator's image.

Lazarev S.V. [3] also talks about filtration (conscious manipulation of information by the sender), selective perception, information overload and gender differences that hinder the communication process.

Kurbatov V.I. [2] grouped the errors that arise in the communication process in way as follows:

1. Sending a message (the message is poorly worded and stated, the message is incomplete and insufficient, the message codes are badly selected, erroneous data are transmitted).

2. Receiving messages (the message is incomprehensible; the message is understood incorrectly; the recipient's prejudicial attitude to the sender's message; the message is not received at all; the message is not acknowledged).

3. Personal attitudes (inattention while sending and receiving messages; lack of interest; incompetence; haste; irritability; extreme emotionality; aggressiveness; non-compliance with communication rules).

4. Collective action (absence of a common goal; the struggle for leadership in the group substitutes the common goal; very strong dependence on the leader; excessive authoritarianism; the absence of a leader).

5. Organization (poor organization of the group, absence of distribution of functions among the participants; absence of a method of work; lack of control, insufficiently developed communication structure; a

structure of communication doesn't correspond the problem being solved; the structure of communication is too tough; there are several communication structures that are not coordinated with each other) [6, p. 43-44].

According to Fysun A.V. [9], the effective functioning of the internal communications system is impeded by such factors as: lack of corporate identity, controlled reputation; the problem of cognitive dissonance (the situation when a person receives conflicting judgments of approximately the same status about the same subject from different sources); the growing amount of information and the lack of time for its consideration; limited information capacity of perception (limitedness of short-term memory); poor structuring of the message; discrepancy between "text" and "pictures"; irrelevance (inconsistency of the way of the information presentation to its perception); the problem of targeting of channels and content; ignoring of audience information requests. The author calls the absence of a real marketing approach to the development of the system of intracorporate information distribution as an integral problem that prevents the effective functioning of internal communications funds.

Russian researcher Rybkin A. [7] determines four main groups of communication barriers: problems connected with goal-setting, enterprise structure, technical and personal problems.

Thus, within the first group, the author identifies following key obstacles: the absence of common goals or their misunderstanding, inconsistency of goals and actions, incorrect goal wording, convergence (crossing) of goals, incorrect wording of tasks within a clear goal.

Another group of possible problems is connected with the structure of the enterprise and contains the following obstacles:

- non-optimal structure;
- poorly organized business processes and distribution of documentary and information flows;
- unclear distribution of responsibilities and spheres of responsibility;
- the lack of information among employees concerning the functional responsibilities of the employees of the enterprise and to whom and concerning which issues one can address;
- limited access to information;
- absence of the procedures of information exchange, decision making, etc.

Technical problems can negate all efforts, even if there is a desire to convey their point of view to the personnel of other departments or organize the exchange of views, primarily due to the following reasons:

- slow speed of information transfer;
- wrong choice of information sources;
- incompleteness and inaccuracy of information transfer;

- insufficient information literacy of personnel;
- inadequacy of information transfer, «noise» distortion.

Accordingly, the personal component includes informal relationships between employees and groups, clashes of ambitions, personal characteristics, inconsistency of joint projects to interests, inevitability during the interaction of time expenditures that provide additional load, inconsistency of the existing «balance of power», feedback neglecting.

Pushkar R.M., Tarnavska N.P. [2] consider that the main barriers of communication are as follows: competition between messages; perception of the message by the recipient; language, logic, abstraction, i.e. sender must adapt his messages to the level of the audience, skillfully select a dictionary, design of his messages; the status of the person sending the message; resistance to change.

In general, regardless the approach of one author or another, the considered obstacles worsen the condition of the internal communications and the state of the communication processes management at enterprises as a whole. At the same time, ineffective management of communications can manifest itself in many negative consequences for the enterprise –from insignificant, concerning individuals, to large-scale ones, which significantly affect the activity of the whole enterprise.

Thus, the examples of ineffective management of internal communications can be as follows: duplication of functions, loss of time with simultaneous use of various communication channels, providing of unnecessary information, etc. Let us consider them in more detail.

Therefore, during simultaneous use of different communication channels for the same information transfer (Figure 5.2), there is a loss of time and the information load on the department or on its employees increases which have to analyze all received information and compare its identity.

Thus, in Figure 5.2 we presented a typical elementary scheme, which shows the transfer of identical information through various communication channels with use of various communication media. At the same time, there may be a situation when messages are transferred via different channels by one type of information transfer means (for example, within the technological one: by phone, e-mail, Skype, etc.), that can be complicated by obtaining a number of similar messages from some departments or some people. In practice, it is an array of information. As a result duplication of messages leads to their accumulation, an increase in processing time and the appearance of errors in the interpretation of their content and the decision making.

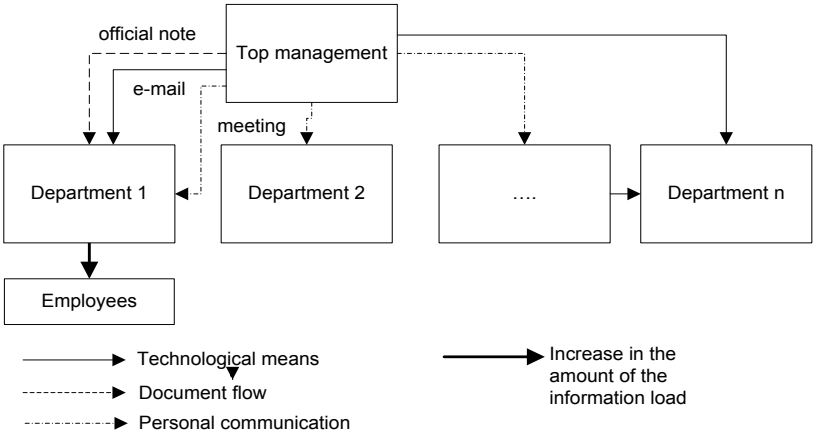

Figure 5.2. Scheme of simultaneous use of various communication channels for the transfer of identical messages (hypothetical example)

The duplication of functions (Figure 5.3) is considered as the fulfillment of the same work at different hierarchical levels of management by different structural units and different persons.

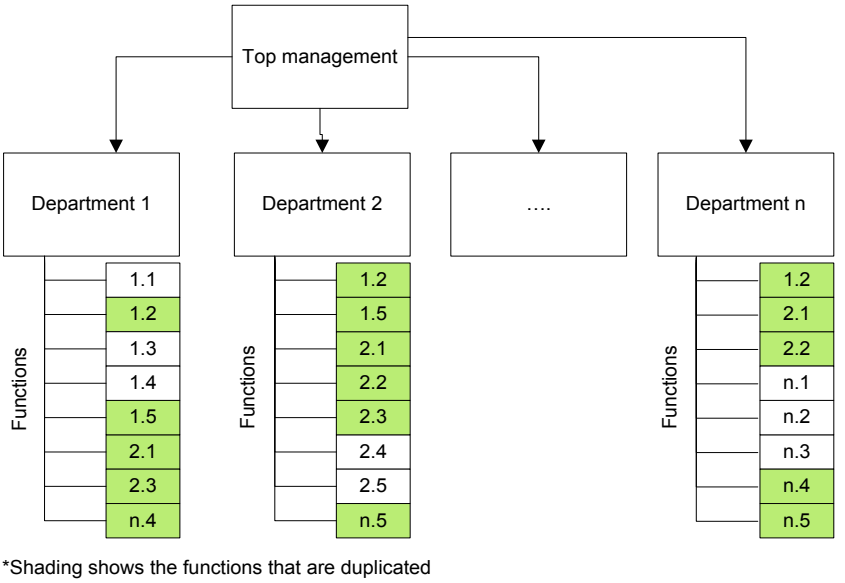

Figure 5.3. The duplication of functions as one of the forms of manifestation of ineffective management of internal communications of the enterprise (hypothetical example)

First of all, it should be noted that there is a minimum acceptable (necessary) number of duplicating functions (as a rule, they are of checking and controlling nature) at each enterprise. However, in situations when actually all functions, which according to the job descriptions, management instructions, project needs, etc., must be assigned to one person/one unit, are duplicated by several persons/units, it, above all, leads to an increase in the load on the employees, reduce of attention to the basic functions, possible performance degradation, loss of time on unnecessary functions performing, the lack of clear distribution of responsibility for the result of a specific person and a decrease in the effectiveness of the performed functions.

The emergence of communicative gaps in business processes is the next variant of the consequences of ineffective management of internal communications (Figure 5.4). These gaps are formed under the influence of many factors, including the factors of social, organizational, technological and informational nature (Table 5.4). Accordingly, the presence of such gaps leads to the distortion of the message content, to partial or complete loss of information as a result of the interruption of the communication process, which, in turn, leads to the delayed performance or failure to perform tasks (for example, unfulfilled orders, expired deadlines), loss of information relevance, inconsistency of the information to the situation at the enterprise, etc.

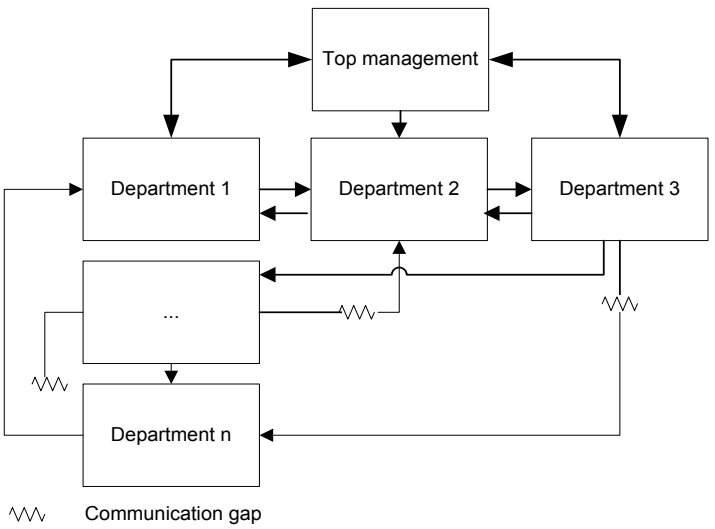

Figure 5.4. Communication gaps in communication process (hypothetical example)

Providing of unnecessary information (Figure 5.5) from one department/person to other departments/persons is also one of the forms of manifestation of ineffective management of internal communications.

The problem is that the existing practice of enterprises to do mass, rather than purposeful dispatch of information messages leads to the receiving of unnecessary, superfluous information by the functional units of the enterprise. The results are:

- loss of time for analysis of received information;
- reducing the degree of responsibility of the person who must perform the tasks;
- loss of well-established feedback;
- reduction in the degree of controllability of the collective;
- duplicating of functions;
- emergence of additional communication channels, etc.

All this causes the complication of communication system at the enterprise and increases the duration of business processes.

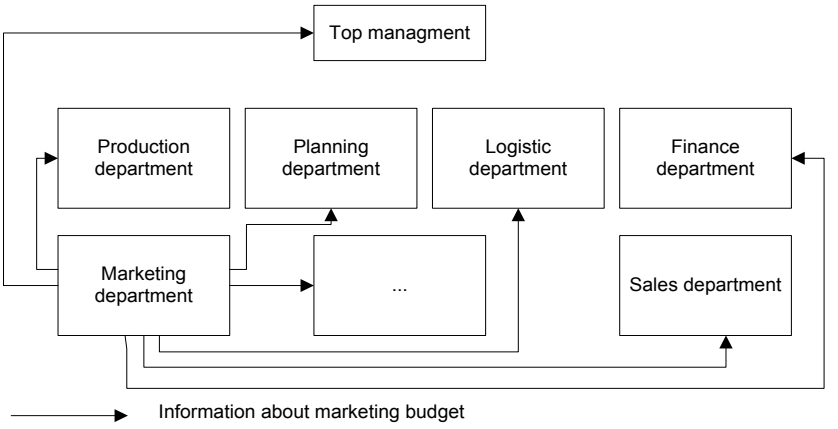

Figure 5.5. Providing of unnecessary information as one of the forms of manifestation of ineffective management of internal communications (hypothetical example)

Unclear wording of goal (tasks) (Figure 5.6) provides, accordingly, different understanding of the goals (tasks) by different units /individuals and as a result – the use of various methods and means to achieve them. The process of actions coordination on achieving the result is complicated. The essence of result everyone understands in his own way. All this leads to a shortage of the planned results within the set period and in certain volumes.

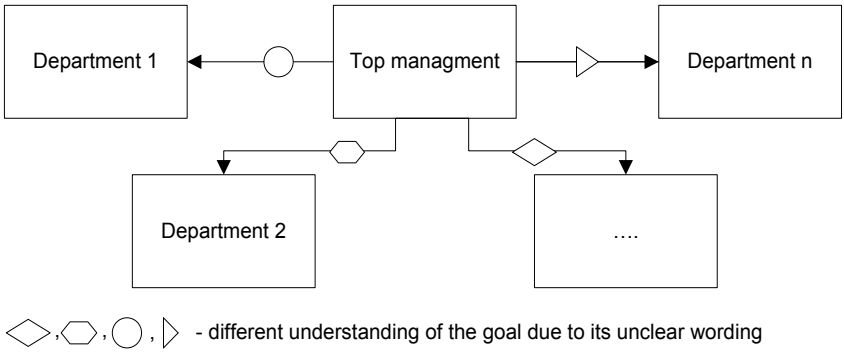

Figure 5.6. Scheme of unclear setting of goal by management (hypothetical example)

In general, the researchers identify a large number of problems with narrowed directions: only social, psychological and other types of obstacles are taken into account. There is no integrated approach that allows an enterprise to systematize the existing barriers with purpose to carry out thorough analysis (availability, preconditions and degree of occurrence probability) and to make appropriate management decisions to minimize the impact of barriers or eliminate them completely. Obstacles are not distinguished by the elements of the communication system, although the problems of unsatisfactory information exchange named by different authors are well integrated into the proposed concept of the determining of technological, socio-psychological, organizational and information subsystem. At the same time, we suggest to distinguish the economic direction of the causes of ineffectiveness of internal communications and separation of the barrier types discussed above by determined directions (Figure 5.7). We also consider it appropriate to determine the consequences caused by inefficient communications under the impact of organizational, socio-psychological, technological, information, economic groups of communication obstacles and possible solutions in case of necessity (Figures 5.8-5.9).

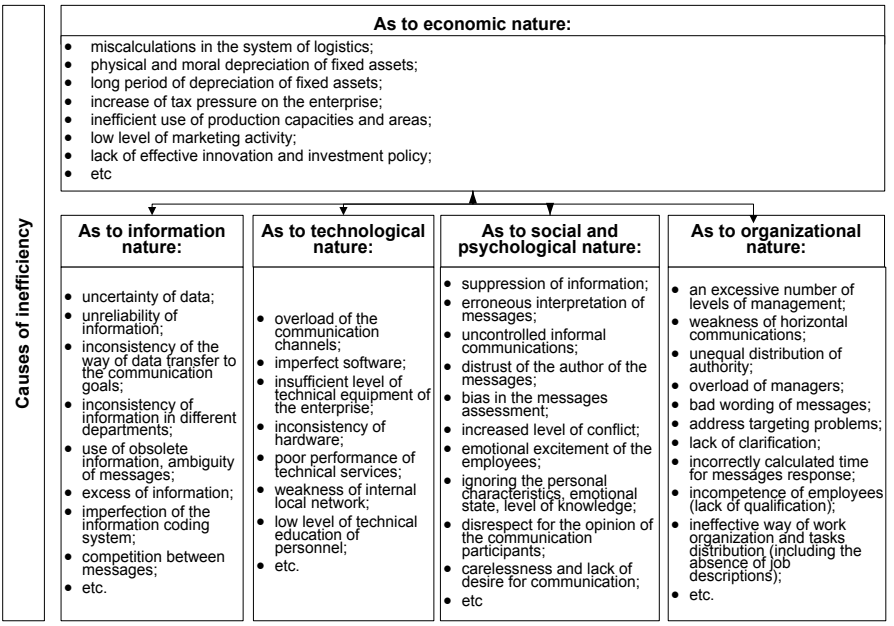

Figure 5.7. Types of causes of internal communications inefficiency

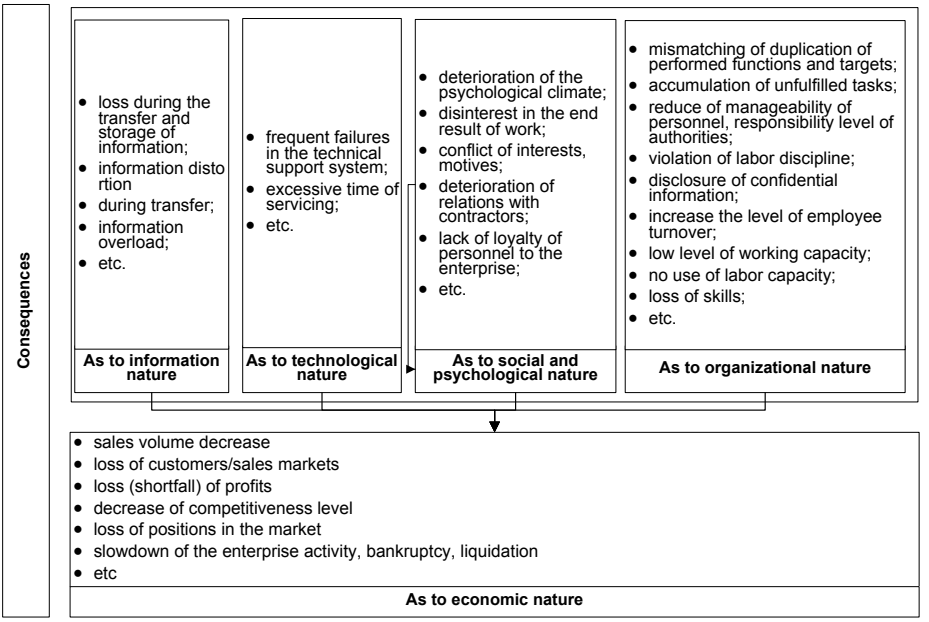

Figure 5.8. Consequences of internal communications inefficiency

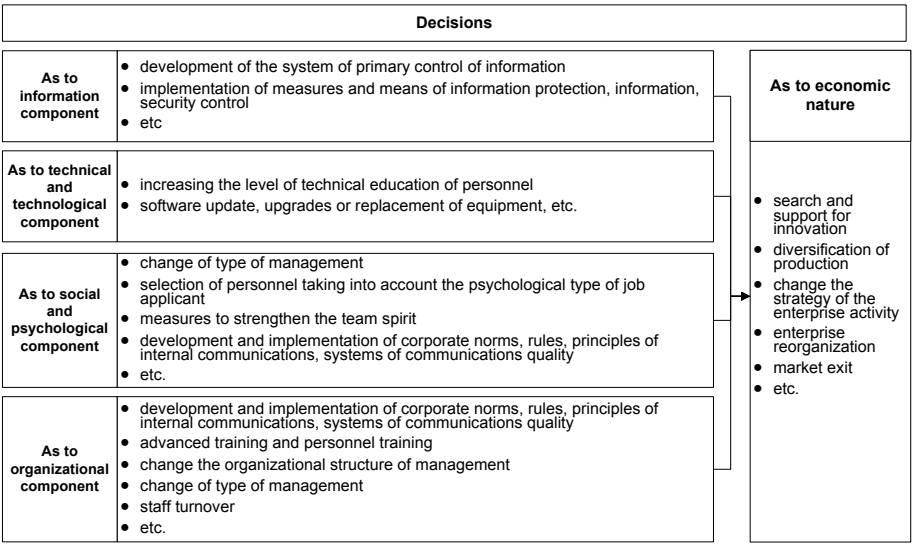

Figure 5.9. Possible variants of managerial decisions depending on the types of causes of the internal communications inefficiency and their consequences

It should be noted that most of the solutions presented in Figure 5.9, carry the fundamental changes and are accompanied by considerable time and money losses. To prevent them, it is necessary, first of all, to build a mechanism for assessing the negative impact of factors of the internal and external environment on the communication process, with an emphasis on the analysis of the preconditions for occurrence and the likelihood of communication obstacles. It is also appropriate to implement the measures on prevention or minimization of the risk level of communication obstacles occurrence.

The effectiveness of any communications depends on several elements, in particular: the source of the message; the essence of the message; audience (level of preparedness, quality (self-respect, dogmatism, authoritarianism); channels and means of communication (verbal and non-verbal).

If the degree of development of the current communication system is insufficient to ensure the operation of the enterprise, then it is necessary to identify the weaknesses of the system and to formulate the measures on communications improving [10]. The conducted researches prove that the communication is hampered by the causes connected with imperfection of separate components of the communication system.

Accordingly, to minimize the impact or overcome each of these barriers, there are certain measures, the application of which should be

comprehensive and take into account the specifics of all participants in this communication process [11]:

1) implementation, replacement or modernization of the enterprise management information system or its individual elements;

2) improvement and modernization of the technical infrastructure of communications and software;

3) improvement of informational support of the enterprise activity;

4) development or improvement of external and internal communication strategy;

5) increase of the communicative literacy of employees;

6) improvement of the organizational structure of enterprise management and ensuring its communication flexibility;

7) compliance with the principles of forming the system of internal communications at the enterprise.

Therefore, in order to increase the effectiveness of communications, it is necessary to explain clearly the messages, demonstrate the understanding, openness in conversation, watch the behavior and the respondent's response; coordinate the information flows of the organization, simplify the information exchange schemes, pay attention to the intonation of message and its unambiguous interpretation, use modern technologies for accurate and fast data exchange, use various IC tools with taking into account the different aspects of perception by the target groups. But, first of all, the effective construction of a communication system should be based on the principle of feedback. Only in such case, the main goal of using the formation will be achieved by increasing the level of loyalty and motivation of the personnel of a healthy corporative culture that supports the business development strategy and helps to achieve the enterprise's goal.

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5.3. Activity of electric power engineering enterprises on the basis of socially responsible marketing

Samoylenko I.O., Gnatenko M.K.

In the context of the country's economic development globalization, it is extremely important to revise the entire socio-economic system on the basis of ensuring such standards as responsibility, corporate community, dynamism, tolerance, high transparency, etc. Due to a number of objective factors, the issue of social restructuring and modernization of power industry enterprises management is of vital importance by integrating social standards into the corporate policy of electric power companies that would meet the requirements of the modern civilization world, high social standards of life, promote the development of electricity companies and would have a positive social influence.

Numerous programs, projects, and memoranda aimed at creating the conditions for sustainable development achieving, e.g. the International Standard ISO 26000: 2010 «Guidance on social responsibility» [1], the

Standards of the social and ethical accounting, auditing and reporting AA1000 (AccountAbility 1000), the International Standard to assess the social aspects of management systems SA 8000 (Social Accountability 8000), the UN Global Compact in Ukraine (serves as the translator of the Sustainable Development Goals) [2], the Memorandum on Corporate Social Responsibility (CSR) in Ukraine [3], «about the CSR Community» [4], and a whole range of scientific researches [5-10], are for the benefit of this problem and show both global and domestic interest in integrating socially responsible marketing in business activity and corporate structures.

Since the 1970s, the term social responsibility is used in international practice to identify a company's voluntary commitment to improve the quality of life and work of its employees, as well as society and the environment as a whole. This term does not replace the notion of «charity» and «public activity», through which a company confidently deserves the trust of employees and consumers – social responsibility is a deeper concept, through which the company provides itself, first of all, stable and reliable conditions for its own business development.

We consider CSR as an activity aimed primarily at: consumers, employees, the state and society as a whole; as an organization's activity, which is responsible for its decisions and actions influence on the standard of Ukrainian society living and environment improvement; as an organization's activity, which, through the implementation of transparent, honest, open and ethical behavior, promotes sustainable development, including health and well-being of people; takes into account the society interests and the stakeholders expectations; implements programs of social responsibility, that are related to the support of vulnerable groups of the population and work for the long term in accordance with the requirements of active legislation and international standards of conduct.

According to the UN [11, p. 9] 75.8% of corporate entities in Ukraine are engaged in the implementation of social responsibility programs. In this regard, it is extremely important to develop new, effective mechanisms for implementing the concept of socially responsible marketing into the activities of electric power companies, which not declaratively, but at the real cases would prove the Ukrainian citizens the benefits of building a civil society that takes into account the society expectations and complies with active legislation and international standards of conduct. «The modern consumer is no longer attracted to the formal declaration of values. Today, the consumers seek for a sincere interest in solving their problems, and the company's desire not only to become better, but also to change the world around itself. In the era of society

informatization it is important for the domestic enterprises to substantiate its affiliation with the sustainable development supporters» [10].

Taking into consideration mentioned above, following the main principles and guidelines of responsible marketing proposed by Patrick Byers [12], based on the postulates of the Global Reporting Initiative (GRI), that define as essential for business the issues and indicators which reflect significant social, economic and the environmental impact of companies, that may have a significant influence on the behavior of stakeholders or on the company itself [13], let's consider the ways to increase the level of consumers' interests protection by Legislative consolidation of service quality standards as well as liability measures for non-compliance.

In general, the practical implementation of the socially responsible marketing principles in the activities of electric power companies is carried out through five key aspirations for social responsibility: a company for its consumers; a company for its employees; a company for the community; a company for the environment (eco-company); reliable and safe company. The philosophy of these five aspirations is given in Table 5.5.

Table 5.5. Five key aspirations for social responsibility

Essential content	Goals and Indicators
a company for its consumers	
The modern concept of business management has set a new philosophy of B2C interactions – the formation of a transparent environment between the company and the consumer, trustful and productive relationships. The increasing company attention to the customer service requires the introduction of high standards of service, the establishment of new approaches to the quality of traditional functions performance by each employee, the understanding by each specialist his proactive behavior in managing the process of interaction with the consumer	1. Improvement of company business processes proceeding from the client's expectations; 2. Increasing and improving the main communication channels with the consumer: work of the call center, SMS-informing, web-chat development; operative service of all consumers' phone calls; 3. Opening of Customer Service Centers. The key – is the principle of a «single window»; 4. Implementation of customer-friendly payment methods, in particular, the work of the Personal Cabinet – a separate section on the Company's website for each electricity consumer. 5. Introduction of the Customer Service Standard - a clear set of rules and instructions on how to make enjoyable, efficient and non-conflict communication with the client; 6. Improving the quality of electricity transmission and ensuring energy supply reliability; shortening scheduled shutdowns; increasing the operational and repair personnel efficiency; 7. Providing consumers with prompt and accurate information on power outage. The key – is to adapt the company's services to the customer needs, to provide quick and efficient responses to all consumer requests; 8. Admission of citizens to energy company XOs: establishing communication between the energy company leadership and consumers

Table 5.5. Continuation

Essential content	Goals and Indicators
a company for its employees	
In its activities the company is guided not only by the task of effective implementation of human resources management processes, but also creates an environment that opens up new opportunities for employees development, stimulates new initiatives and achievements, is interesting for daily activities	1. Implementation of the contractual relations terms (the purpose - is not to worsen the conditions of the current Collective agreement and to fulfill the obligations entered into); 2. Preventive and information program of medical direction; 3. Provision of decent wages; 4. Promotion of employees' professional development; 5. Development and maintenance of a favorable microclimate in the team (ensuring comfortable and safe working conditions, attention to the life and health of each employee and his family is crucial for the company's activities); 6. Employment of people with disabilities; 7. Increase of competencies in project management; 8. Active inner life
a company for the community	
The support of cultural traditions is one of the key elements of the company's social investment. It promotes the promotion of the enterprise not only at the regional and national level, but also worldwide	1. Sports support; 2. Cooperation with local communities; 3. Development of charity; 4. Assistance in implementation of the barrier-free environment program (unimpeded access to public facilities for the disabled) through the introduction of volunteering
a company for the environment (eco-company)	
An important characteristic of social responsibility is the desire to integrate social and environmental issues into their decision-making process and be accountable for the impacts of these decisions and actions on society and the environment	1. To promote the energy and resource efficiency improvement (accounting for consumption and rational use of all resources: water, electricity, paper, stationery, cartridges; procurement considering environmental properties and labeling of goods; reducing transport impacts on the environment by both the company and its employees, etc.; 2. Systematization of environmental protection (gradually replacing environmentally harmful fluorescent and energy saving lamps with more environment-friendly and energy efficient LED bulbs; attracting (on a voluntary basis) company employees to ecological actions (local, regional, national), etc.); 3. Improvement of the process of waste utilization from the company's activities (for example, to implement separate collection of waste for further utilization (plastic, glass, paper, solid household waste)); 4. Promoting environmentally conscious behavior through the development of a system for managing ecological knowledge aimed at increasing the ecological awareness of employees; 5. Implementation of the environmental management system in accordance with ISO 14001. 6. Implementation of the energy management system based on the requirements of the international standard ISO 50001.

Table 5.5. Continuation

Essential content	Goals and Indicators
	reliable and safe company
The specifics of the activities of the electric power industry enterprises are connected to the work with a dangerous product, which is why the reduction of risks is a priority for the enterprise activity	1. Ensure compliance with the International Standard OHSAS 18001 (conducting internal audits to detect non-conformities of the labor protection management system to the standard, its operational analysis and elaboration of corrective actions to eliminate identified non-conformities); 2. Popularization of «safe» behavior in a team; 3. Reducing the electric traumatism by raising awareness of the population; 4. Replacement of equipment that does not meet safety requirements; 5. Expansion of informing children about safe behavior near the company's energy equipment through the development of corporate volunteering (excursions to the museum for school pupils, actions in child camps); 6. Regulation of electrical equipment

It should be noted that in the liberalized electricity market the customer rights are protected taking into account the mutual influence of three factors:

- market competition that forces suppliers to offer the best prices and quality of services to the consumers;
- regulatory control of energy companies to ensure the reliability and quality of electricity supply for all consumers at affordable prices;
- the influence of consumer associations representing and protecting consumer interests, on regulators and suppliers.

In this regard, the regulation of the quality of services in the domestic market of electricity companies can be carried out with the following measures:

- establishing requirements for the publication of information on the energy supply company (ESC) performance indicators, which enable to create external pressure and stimulate ESC to address quality issues;
- conflicts resolving measures: organization of quality of service hotlines, appointment of the Commissioner for Consumer Rights, participation of consumers in the consulting or supervisory boards of companies;
- establishment of minimum standards of activity: the definition of minimum limits on certain aspects of activity, the violation of which involves imposing fines and reducing tariffs;
- the use of incentive measures: the establishment of target quality indicators, the failure to achieve which imposes fines, and the excess - a financial reward.

In accordance with the international standards, assessment of the reliability and quality of ESC services is determined by its effect for end users. For many consumers ESC is the «only window» in the electric power industry. It is in terms of quality of services that the consumer values the transformations in the industry, the efficiency of energy sector functioning, the fairness of tariffs, and often the work of the authorities. In this regard, regulation should focus on those service quality indicators that are, firstly, important to the consumer, and secondly, can be controlled by the ESC and, thirdly, can be quantified by the regulator.

The assessment relates primarily to service quality aspects such as continuity or reliability of electricity supply (number and frequency of power outages); technical quality (physical characteristics of electricity supply, for example, voltage variations); commercial quality (the quality of relations between the companies and consumers, for example, complaints from consumers, time of consumer complaints response, etc.). Taking into account that the indicators of commercial quality of services are the time and quality of service of consumers, the quality of informing consumers and indicators of consumer satisfaction, the generalized indicator is integrated and consists of indicators of the quality of services provided, determined in points (maximum - 3 points) and calculated according to such formula:

$$yKCOM = k\text{і.}\times \text{Іінф.} + k\text{в.}\times \text{Івідпов.} + k\text{рез.}\times \text{Ірез.}, \qquad (5.2)$$

where $I_{inf.}$ – the quality of informing indicator; $I_{resp.}$ – the quality of responsibility indicator; $I_{perf.}$ – the feedback performance indicator; $k_{i.}$, $k_{r.}$, $k_{p.}$ – weight coefficients of the corresponding quality indicators for which the following values are recommended: $k_{i.} = 0{,}1$; $k_{r.} = 0{,}6$; $k_{p.} = 0{,}3$.

The value of each indicator of the quality of services provided is determined by the assessment of the relevant quality indicator as the arithmetic mean of all the estimates of the parameters characterizing the corresponding quality indicator.

The quality of informing indicator $I_{inf.}$ characterizes the completeness, authenticity, relevance and accessibility for consumers of information on the volume, order of provision and cost of the services provided, and is determined by the following formula:

$$I_{inf} = \frac{1}{6}\sum_{j=1}^{6} O_j^{I_{inf}} \qquad (5.3)$$

where $O_j^{I_{inf}}$ – the value of the estimated point of the *j*-th parameter of the quality of informing indicator.

The quality of responsibility indicator $I_{resp.}$ characterizes the degree of ESC obligations to customers fulfillment in due time, regulated by the relevant documents, and is determined by the following formula:

$$I_{resp.} = \frac{1}{7}\sum_{j=1}^{7} O_j^{I_{resp}} \quad (5.4)$$

where $O_j^{I_{resp}}$ – the value of the estimated point of the *j*-th parameter of the quality of responsibility indicator.

As a variable that influences the value of the quality of responsibility indicator, advocates the assessment of compliance with regulatory and legal acts on the electricity quality and compliance with legal norms on the protection of consumers personal data.

The feedback performance indicator Iperf. characterizes the availability of effective feedback to customers, which enables to adequately address the issues arising in the course of their activities, in particular those related to the quality and cost of the services provided, and is determined by the following formula:

$$I_{perf.} = \frac{1}{5}\sum_{j=1}^{5} O_j^{I_{perf}} \quad (5.5)$$

where $O_j^{I_{perf}}$ – the value of the estimated point of the j-th parameter of the feedback performance indicator.

It is worth noting that the international method of data collection on the reliability and quality of energy supply obliges the companies to shift the emphasis on assessing consumer satisfaction with the quality of their services. It is possible to receive and parameterize this estimation only through the feedback performance indicator $I_{perf.}$

Summing up, it should be noted that the strength of the introduction of socially responsible marketing into the electricity companies' activities is the harmonization of relations and the establishment of partnerships between power companies, consumers, government agencies and the public. Electric power companies receive: increasing level of consumer confidence in the company activities, its products and services; compliance with international norms, principles and standards; the

trust of foreign investors and their loyalty; improvement of business reputation and image of the company, provision of public reputation; improving energy infrastructure as well as financial and economic performance, obtaining from stakeholders information that can help improve business processes; stability and sustainable existence of the company in the long run. In addition, the security of the energy infrastructure is strengthened and the guarantees of infrastructure provision of the necessary volumes of services emerge to maintain the tariff at an acceptable level.

Consumers receive: affordable, reliable, efficient, high-quality, environmentally safe, properly regulated and socially-accepted energy services, as well as reasonable tariff policies that provide for the availability of electricity to all population segments.

Society and the state: improvement and development of the institute of consumer rights protection; development and legal consolidation of mechanisms of legal behavior according to legislative and contractual norms and corporate values; ensuring social welfare, transparency and accessibility of information about the state of the energy infrastructure (EI) subjects, strengthening the relations of the EI subjects with the public and cooperation between the key participants of the process; ensuring the balance of consumer, society and state interests and their mutual responsibility; stimulation of innovation activity and the possibility of supporting investment projects and innovation projects of the EI entities; responsible corporate governance and new opportunities for economic, social and cultural prosperity of the country.

The weak point is that socially responsible marketing within the framework of our society is more of a scientific research and discussion subject than the norm and regulator of public life. In addition, the other obstacle is the lack of legislative regulation and information closure of the majority of Ukrainian electric power companies to the general public (detailed information on the company's internal and external activities is closed).

The opportunities include relying on international experience on: What minimum standards should be set for energy companies' customer services? How modern technologies within the framework of socially responsible marketing affect the organization of work with consumers (collection of payments, notification, and organization of commercial accounting)? What are the best international practices in customer service? What are the international standards for social responsibility and normative and legal acts in the sphere of consumer interests protection and vulnerable population groups?

Among the threats and obstacles to the successful implementation of such projects there are such factors:

- there are no incentives to improve the quality of services (the regulatory company is mainly focused on the requirements of the regulator and not on consumers);
- there are no mechanisms for stimulating the ei to optimize investment activity (the existing tariff policy «cost plus» for transmission and supply of electric energy is ineffective because it does not create incentives for reducing operating costs and losses of power companies, does not form investment attractiveness of the industry, does not stimulate the development of the economy and social sphere. it should be noted that the justified tariff policy envisages the availability of electricity to all population segments and is a guarantor for the population);
- there are no institutional instruments (lack of a body that could introduce mechanisms of public control with the consumers participation).

Taking into account the above-stated analysis of the principles of socially responsible marketing in the power industry, it can be argued that social responsibility nowadays is a prerequisite, leading to a financially profitable business and sustainable development of both the company and the state as a whole. Implementation of corporate social responsibility should be carried out in four directions: (1) corporate management standards; (2) employees; (3) society; (4) the environment, which in turn indicates a strategic approach to social responsibility and its implementation. In addition, it should be noted that the policy and strategy of corporate social responsibility should be closely linked to the development strategy of the enterprise, as the electricity industry is a part of society in general and of the territorial community in particular.

Due to the fact that electricity companies are part of society in general and of the territorial community in particular, they must react systematically to social needs, provide the right example, ensure the rule of law, humanity and responsibility in their territory and outside their own location. And the term corporate social responsibility for electricity companies is manifested in the social, economic and cultural life of citizens and is based on the principles of honesty, openness, transparency and responsibility.

In order to ensure the interests of consumers, increase the level of electric power companies corporate consciousness and develop a socially-oriented system of energy infrastructure, it is necessary to add to a list of strategic priorities such key issues as increasing the reliability of electricity supply and ensuring the quality of services provided with the transition to the world standards. An integral part of these measures implementation is the construction on the basis of international standards of reliable measurement and control system for reliability and

quality of services, as well as increasing the responsibility of network organizations management for their failure to comply.

The phased introduction of socially responsible marketing into the activities of electric power companies can become a source of strong growth in the energy sector and significantly increase the level of consumer well-being.

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5.4. Methodical principles for the definition of market knowledge perspectives of a machine-building enterprise

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The current economic development is characterized by the growing role of non-material factors, knowledge in particular, enabling formation and development of enterprises' competitive advantages. Hence, a vital issue of enterprises' knowledge management system formation and implementation occurs. Its main tasks include: definition of promising areas of production and application of knowledge; management of knowledge production or adoption processes; selection of most effective ways of knowledge application, etc. This problem is urgent for machine-building enterprises, since they greatly contribute to development of basically all branches of the national economy.

An analysis of literary sources [1-8] showed that domestic machine-building enterprises use their scientific potential and material basis inefficiently. The most successful enterprises use an effective knowledge management. This allows them to determine promising directions (considering the whole complex of internal and external conditions) of market opportunities, and to form, strengthen and effectively use relative competitive advantages, etc.

The experience of successful Ukrainian enterprises, as well as foreign manufacturers, the achievements of domestic and foreign scholars should form the basis for the development of a knowledge management system of Ukrainian machine-building enterprise. Its practical implementation will strengthen positions of domestic machine-building enterprises in the national and foreign markets.

The works of T. Davenport [9], L. Prusak [9], K.-E. Sveiby [10], B. Milner [11] and others are devoted to development of conceptual foundations of knowledge management at enterprises, in particular knowledge generation, accumulation, application, etc.

Works of T. Davenport [9], A. Simard [12], T. Stewart [13], B. Bishop [14], S. Illiashenko [15, 16], etc. highlight issues of marketing of knowledge, in particular approaches to determining promising directions of their production, promotion and sale.

However, despite significant developments, insufficient research has been devoted to assessment the market prospects (commercialization opportunities) of knowledge of machine-building enterprises. Existing domestic developments address separate aspects of selecting directions for knowledge commercialization and technology transfer. Foreign

developments however disregard specifics of Ukraine's economy, especially its current state.

The purpose of the research is to develop and substantiate theoretical and methodological principles for determining market perspectives of the machine-building enterprise's knowledge.

In general, according to [15], the following areas of knowledge application of industrial (including machine-building) enterprises are distinguished:

1. Management of the enterprise: improvement of the organizational structure of management; optimization of production and marketing process in time and space; optimization of types and directions of activity; reengineering business processes; strengthening innovative development and adjusting it to external conditions, etc.
2. Contribution to the authorized capital (knowledge as objects of intellectual property).
3. Creation and commercialization of new (improved) products on the basis of knowledge, improvement of their production technologies.
4. Direct commercialization: the sale of copyrights to use knowledge as objects of intellectual property (licenses, franchises, leases, etc.); direct sale of property rights for knowledge.
5. Improve existing or select new areas of production and application of knowledge.

According to [16-18], development directions enabling internal capabilities of a knowledge-oriented enterprise match external conditions, generated by the market should be prior to all other alternatives. In other words, directions of knowledge application that ensure existing and prospective market opportunities and counteract market threats most should be selected.

A modified SWOT-analysis, based on the approach of one of the authors [19] is most suitable to determine promising directions of market opportunities development on the basis of enterprise's knowledge. Let's consider the analysis of market prospects of knowledge-oriented development for Ukrainian machine-building enterprises.

According to results of the analysis of scientific papers [1-8] concerning the state of development of the domestic industry, in particular, the machine-building complex, as well as the analysis of statistical data [20], the authors highlighted its strengths and weaknesses.

The strengths (S) include:

(S1) – Specific structure of the machine-building complex enterprises, in particular, the research and development (R&D) divisions;

(S2) – Positive reputation of Ukrainian machine-building enterprises on the markets of the CIS, China, etc. formed as a result of previous cooperation;

(S3) – Competitive (in certain markets) products;

(S4) – Personnel potential of the industry: highly skilled engineers-designers and auxiliary personnel due to the specific education inherited from the USSR, in particular, a considerable number of technical specialties.

The following weaknesses (W) are defined:

(W1) – Low level of innovative potential of the majority of enterprises;

(W2) – Poor introduction of technologies ensuring profits or optimizing the activity of enterprises;

(W3) – Poor product quality, price discrepancy;

(W4) – Low application of intangible assets, which leads to the sale of products as the «raw materials», low ability to produce products with a high value added;

(W5) – Weak technologies commercialization and obtaining profits from intangible assets (licenses sale, receiving interest from technologies use, etc.);

(W6) – Maintaining old market interconnections and cooperation with the same partners;

(CJIC7) – Reluctance to, in most cases, breaking the system of old inter-branch relations;

(W8) – The incommensurability of the nomenclature of products and production areas – the inability to optimize production areas;

(W9) – Exploitation of outdated equipment;

(W10) – Concealing the real economic indicators, the so-called «shadowing», leading to a lack of investment and innovative climate in the industry.

Market opportunities and threats for enterprises of the machine-building complex developing on the basis of knowledge are highlighted by authors' research [21].

Market Opportunities (MO):

(MO1) – Reorientation to the EU market, which directly affects product quality (requirements to meet standards and market quality);

(MO2) – Potential opportunity of European investments;

(MO3) – Potential opportunity of participation of European companies and specialists in the re-equipment of enterprises in accordance with European technical requirements and standards;

(MO4) – Possible favorable market prospects and trends in the EU sectors.

Market Threats (MT):

(MT1) – Low effectiveness of converting ideas into innovative products;

(MT2) – Formed market relations within the framework of the EU. «Climate» of the established intra-European partnership;

(MT3) – High-quality analogues of products presented on the EU market;

(MT4) – Unstable political situation in Ukraine (revolutions, poor or non-constructive reforms, etc.);

(MT5) – Rapid economic downturn (constantly progressing inflation, unstable currency);

(MT6) – Loss of CIS markets as a permanent reserve fund raising;

(MT7) – Lack of a mechanism for protection and support of foreign capital.

Basing of these data, the authors formed the SWOT analysis matrix, presented in table 5.6, using the method of expert analysis (experts were leading specialists of enterprises of the Sumy region, as well as SSU scientists).

Table 5.6. SWOT analysis of the development possibilities of the machine-building complex of Ukraine (developed by the authors)

External environment		Internal environment														Total score	Relative mark
		Strengths				Weaknesses											
		S1	S2	S3	S4	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10		
opportunities	MO1	8	8	7	10	10	10	10	5	4	10	5	6	6	10	109	0,78
	MO2	3	10	10	8	6	8	8	4	3	9	4	5	5	10	93	0,66
	MO3	5	8	7	8	6	6	6	6	5	9	5	7	6	10	94	0,67
	MO4	2	2	6	4	3	5	5	7	3	8	6	4	5	10	70	0,50
Threats	MT1	3	3	5	9	10	10	4	10	4	4	4	5	10	5	86	0,16
	MT2	4	5	5	2	9	6	8	8	5	4	6	6	5	5	78	0,18
	MT3	3	5	8	9	10	4	8	8	6	4	5	4	2	4	80	0,18
	MT4	1	8	6	6	8	4	6	6	5	3	4	3	3	10	73	0,19
	MT5	1	8	6	6	8	3	6	6	4	5	3	4	2	10	72	0,19
	MT6	2	6	8	5	7	2	8	6	3	5	2	4	4	8	70	0,20
	MT7	1	1	1	1	1	1	1	1	1	1	1	1	1	10	23	0,61
Total score		33	64	69	68	78	58	70	67	42	61	45	49	48	91	X	
Relative mark		0,30	0,58	0,63	0,62	0,14	0,19	0,16	0,16	0,26	0,18	0,24	0,22	0,23	0,12		

The matrix is constructed to analyze possibilities of implementation of one of the directions of knowledge-oriented development of the

enterprise – creation on the basis of knowledge and commercialization of new (modified) types of products, improvement of production technologies.

Marks in Table 5.6 cells (on a scale from 1 to 10 points) characterize the degree of influence of the strengths and weaknesses of enterprises of the machine-building complex of Ukraine on the prospects of implementation of existing market opportunities and counteracting market threats. Estimates are presented in accordance with the scale given in Table 5.7.

Marks in table 5.6 cells (on a scale from 1 to 10 points) characterize the degree of influence of the strengths and weaknesses of enterprises of the machine-building complex of Ukraine on the prospects of implementation of existing market opportunities and counteracting market threats. Estimates are presented in accordance with the scale given in Table. 5.7.

Table 5.7. Scale of estimation the degree of influence of the strengths and weaknesses of the enterprise's activity on realization of market opportunities and counteraction to market threats (developed by the authors)

Order scale score	Point scale (B)
Insignificant affect	$B = 1$
Low affect	$1 < B \leq 5$
Medium affect	$5 < B \leq 8$
Great affect	$8 < B \leq 10$

The authors calculated the sums of marks in table 5.6 marks (in lines – for opportunities and threats, in columns – for the strengths and weaknesses of the enterprise). At the same time, the largest sum value on the line (for opportunities) indicates the best market opportunities, the smallest value (for threats) corresponds the strongest threats, the largest value in the column (for the strengths) – indicates the strongest aspects of the activity, the smallest value in the column (for the weaknesses) - indicates the weakest activity.

According to [19] a relative assessment will show a complete picture of the importance of market opportunities and threats, as well as the strengths and weaknesses of the organization. It is proposed to calculate it as the ratio of the actual value of the corresponding line or column to the maximum possible value (for opportunities and strengths), or the minimum possible value (for threats or weaknesses) to the actual one. The best option is with a higher relative value.

In this way, it is possible to select the most promising directions of knowledge application of the industrial enterprise with the correspondence of internal and external conditions.

According to the results of the analysis (see Table 5.6), the strongest aspects of the activity of the enterprises of the machine-building complex of Ukraine are: S3 and S4 with the relative estimations of 0,63 and 0,62 respectively.

The weakest: W5, W7, W9, W8 with relative estimates of 0,26, 0,24, 0,23 and 0,22, respectively.

The best market opportunities are: MO1 and MO3 with relative estimates of 0,78 and 0,67, respectively.

The biggest threats are: MT7, MT6, MT5, MT4 with relative estimations 0,61, 0,20, 0,19 and 0,19 respectively.

Thus, in order to restore the competitiveness of the machine-building industry of Ukraine in the framework of its knowledge-oriented development strategy, it is necessary: to take into account the potential opportunities of the European market; to improve the quality of products via personnel potential of the industry, as well as to re-equip production capacities involving European companies and professionals. This is possible only in case of transparent economy and supporting the investment climate in Ukraine.

According to the mentioned methodology, an analysis was carried out for LLC «Technohim» – one of the leading Ukrainian manufacturers of vibrating granulators. Prior to the analysis, the leading experts and management of the company as well as the teaching staff of the Department of Marketing and Management of Innovation Activities of the SSU were involved as experts. The results of the analysis are presented in Table 3, its purpose is similar to Table 5.6.

Strengths (S) include:

(S1) – Specific structure of the enterprise – scientific production (material and technical base, design departments and R&D departments);

(S2) – Significant share on the market of vibratory granulators (40-50% of the market);

(S3) – Positive reputation due to long-lasting operating in the markets of Southeast Asia, Latin America, Egypt, Israel, etc.);

(S4) – Competitive products (LLC «Technohim» is one of the four largest manufacturers of vibrating granulators worldwide);

(S5) – Technical characteristics of production:

a) granulation quality (98%) and homogeneity of granules;

b) decrease in the temperature of the granules at the exit from the «tower» of the vibrating granulator (up to 45-60 degrees Celsius);

(c) Dust emissions;

(S6) – Certification of production and manufacturing (UkrSEPRO, TU, ISO9001).

Table 5.8. SWOT analysis of development opportunities of Technohim LLC (developed by the authors)

Opportunities and Threats		Strengths						Weaknesses					Total score	Relative mark
		S1	S2	S3	S4	S5	S6	W1	W2	W3	W4	W5		
Opportunities	MO1	8	8	10	10	6	9	7	3	8	8	3	80	0,73
	MO2	8	8	10	10	6	8	6	1	8	6	4	75	0,68
	MO3	8	9	10	10	5	9	7	1	7	7	5	78	0,71
	MO4	1	9	1	8	1	2	6	1	2	2	2	35	0,32
Threats	MT1	5	7	10	9	2	10	4	2	2	2	2	55	0,20
	MT2	1	3	3	3	1	1	1	1	1	1	1	17	0,65
	MT3	1	3	3	4	1	1	1	1	1	1	1	18	0,61
	MT4	1	2	3	2	1	1	1	1	1	1	1	15	0,73
	MT5	1	3	1	1	1	1	1	1	1	1	1	13	0,85
Total score		34	52	51	57	24	42	34	12	31	29	20	X	
Relative mark		0,38	0,58	0,57	0,63	0,27	0,47	0,26	0,75	0,29	0,31	0,45		

Weaknesses (W) include:

(W1) – Lack of skilled personnel (mass departure of highly skilled personnel to other countries);

(W2) – Incomplete use of production capacities potential (development and implementation of only 2-3 projects per year);

(W3) – Lack of a powerful advertising campaign;

(W4) – Insufficient number of marketers, specialists of the international department to enter new markets;

(W5) – Lack of opportunities for commercialization of technologies and receiving profits from intangible assets (licensing, receiving interest from technologies use, etc.).

Market Opportunities (MO):

(MO1) – Reorientation to the EU market, which directly affects product quality (requirements to meet standards and market quality);

(MO2) – Potential opportunity of European investments;

(MO3) – Potential opportunity of participation of European companies and specialists in the re-equipping enterprises in accordance with European technical requirements and standards;

(MO4) – Possibly favorable market prospects and trends in the EU sectors.

Market Threats (MT):

(MT1) – Difficulties with entering the EU markets due to established market interconnections within the EU. «Climate» of the established intra-European partnership;

(MT2) – Unstable political situation in Ukraine (revolutions, poor and non-constructive reforms, etc.);

(MT3) – Rapid economic downturn of Ukraine (constantly progressing inflation, unstable currency rate);

(MT4) – Loss of CIS markets as a permanent reserve fund raising;

(MT5) – Lack of a mechanism of protection and support of foreign capital.

According to the results of the analysis (see Table 3), the strongest aspects of the activity of «Technohim» LLC are: S4, S2 and S3 with the relative estimations of 0,63, 0,58 and 0,57, respectively.

The weakest: W2 and W5 with relative estimates of 0.75 and 0.45 respectively.

The best market opportunities are: MO1, MO3 and MO2 with relative estimates of 0.73, 0.71 and 0.68, respectively.

The biggest threats are: MT5, MT4 and MT2 with relative estimations 0,85, 0,73 and 0,65, respectively.

Thus, the company should solve the personnel problems, perhaps by attracting foreign specialists and changing its advertising policy. Such changes, together with the existing strengths (market share, reputation and product quality), will allow the possibility of entering the EU market and attracting European investments.

The proposed methodological approach (its practical implementation is given in Tables 5.6-5.8) allows to quantify the market opportunities and threats for a particular knowledge-oriented direction of enterprise's development, and accordingly, its success. In addition, it allows to determine characteristics of the enterprise requiring special attention to increase its potential, and accordingly, the chances of market success.

A similar analysis is performed for each of the possible directions of knowledge application. The best options from a number of alternatives are selected according to the criteria: favorable market opportunities, which have high relative estimates; strengths in the enterprise's activity (with high estimates), which enables implementation of the analyzed option; insignificant market threats; weaknesses of the enterprise do not affect the implementation of the analyzed option.

It is necessary to determine boundary (critical) values of relative assessments indicating the level (strength of affect) of the strengths or

weaknesses of the enterprise, as well as the adequacy of market opportunities and threats for implementation (non-implementation) of the development option.

According to [19], the critical values of relative estimates (Oi) should be determined by a scale based on the Pareto (20/80) principle and the scale used in the ABC analysis (50/80/100):

- Oi = 0,0-0,5 (insufficient level – the project cannot be implemented);
- Oi = 0,51-0,80 (average level allowing to consider the project and launch its first stages);
- Oi = 0,81-1,0 (sufficient level).

However, the situation with the maximum estimates of market opportunities and strengths of the enterprise in line with a minimum of market threats and weaknesses is rather an exception. Possible correlation of evaluation criteria and corresponding actions are given in the author's table of decisions (Table 5.9). For convenience, let's convert the specified valuation ranges into normalized values: 0.0-0.5 = 1; 0.51-0.80 = 2; 0.81-1.0 = 3.

This table of decisions (Table 5.9) is recommended for the evaluation of alternative projects, as well as the selection of actions to ensure a greater compliance of internal capabilities of knowledge-oriented development of enterprises to external conditions, generated by the market.

Summarizing the data of the table 5.9 the following conclusions should be made:

1) projects with the maximum S and MO estimations and the minimal W and MT estimations have high chances for implementation;

2) projects with the S and MO estimates exceeding one level the W and MT assessment have averages chances for implementation

3) projects with the S estimates exceeding W estimates more than one or two levels, with the same MO and MT estimates have chances for implementation below average;

4) Problem projects have the same S and W estimates, while MO estimates exceed MT estimates at one or two levels. They should be rejected, or the possibility of increasing S or (or) reducing W should be analyzed;

5) projects with the same values of all evaluations (S, W, MO, MT) have a high degree of uncertainty, they require deep analysis;

6) projects with minimal estimations of S, W, MO and MT should be rejected;

7) projects with a correlation of estimates different from those discussed in 1-6 sections should also be rejected.

Table 5.9. Table of decisions on the selection of directions of knowledge-oriented development (fragment)

Option number	Assessment criteria				Decision
	S	W	MO	MT	
1	3	1	3	1	High chances for implementation
2	3	2	3	2	averages chances for implementation
3	3	2	3	1	
4	3	2	2	1	
5	2	1	3	2	
6	2	1	3	1	
7	2	1	2	1	
8	3	2	2	2	chances for implementation below average
9	3	1	1	1	
10	3	3	3	3	Needs further analysis
11	2	2	2	2	
12	1	1	1	1	Reject
13	3	3	3	2	Invalid options
14	3	3	2	2	
15	3	3	2	1	
16	3	2	3	3	
17	2	2	3	2	
18	2	2	3	3	
19	3	3	1	1	
20	2	2	1	1	
21	2	2	2	1	
22	3	3	3	1	
23	2	2	2	1	
24	2	2	3	1	

The final selection of options of knowledge-oriented development should be carried out according to different criteria in order to comprehensively and objectively evaluate innovative projects and choose the best.

In particular, such criteria can be:

- financial value (NPV, IRR);
- payback (RR, IRR, MIRR);
- Strategic cost, characterizing the profitability of the project in future. The strategic cost is difficult to assess by cost indicators; the assessment, as a rule, has a probabilistic nature, due to a significant level of uncertainty and, accordingly, risk. To estimate the strategic cost, probabilistic forecasts of future events should be drawn up and the degree of their impact on the project's effectiveness assessed. For example, entering foreign markets in future, resulting in the expansion of consumers and growth of consumption, and, consequently, in increase of profits;

- satisfaction of economic counteragents and contact audiences of the analyzed enterprise interests;
- project risks;
- motivation for owners and personnel of the enterprise to develop in a knowledge oriented way (managers, engineering and technical staff, workers, etc.).

It should be noted that evaluation by given criteria (groups of criteria) is performed by different scales and can be both quantitative (according to some criteria) and qualitative, with the criteria having different significance. Since it concerns mainly innovative projects, there may not be a comparison bases. In this case, it is advisable to apply approaches of integrated assessment that determine the degree of compliance of a particular project to selected criteria (mentioned above) of the chosen scale. At the same time, the critical value of the degree of compliance is determined (calculated) according to separate criteria, and to the whole criteria set.

Summarizing mentioned above we can make following conclusions:

- the methodical approach to definition of market perspectives of the machine-building enterprise knowledge was proposed. It is based on the author's interpretation of SWOT-analysis and allows to quantify projects of knowledge-oriented development;
- a table of decisions was proposed. Recommendations for selection the best options and projects of knowledge-oriented development on its basis were developed;
- practical testing of the developed methodical approach for perspective directions of the knowledge-oriented development of the machine-building complex of Ukraine was carried out. The analysis of one of the enterprises of Sumy region, LLC «Technohim», which manufactures machinery and equipment for the chemical industry, was carried out;
- a methodical approach to the refined multicriteria assessment of selected projects of knowledge oriented development was proposed;
- the proposed methodological approaches provide the opportunity of quantitative assessment of market opportunities and threats, as well as the chances of market success of a specific project of enterprise's knowledge-oriented development. They also assist to determine activity aspects of the analyzed company requiring attention to increase their chances to market success.

The obtained results deepen theoretical and methodical principles of knowledge management of machine-building enterprises in terms of quantitative assessment of their market prospects. Further research should be aimed at forming the fundamentals of the organizational and economic mechanism of knowledge management of machine-building enterprises.

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5.5. Management of marketing activities of enterprises on the internet: planning and organization of processes

Boychuk I.V.

Active development of the Internet has led to the wide introduction of the global network as an effective marketing tool in the activities of enterprises. Owing to modern information and computer networks, experts exchange information between firms, receive data about buyers and competitors, and find the necessary data for making managerial decisions.

The expediency of using the Internet in marketing activities is due to the need to take into account the specific features and conditions of use of modern technologies in implementing marketing approaches to product promotion, finding the necessary information, potential customers and business partners, expanding markets and sales channels, ensuring the effectiveness of advertising campaigns, organizing an effective system of feedback from consumers.

Significant contributions to the theoretical aspects of online marketing activities have been made by many well-known scholars, including L. Weber [3], Ph. Kotler [7], T. Kegler, P. Douling, B. Taylor, D. Testerman [9], B. Halligan [10] and others. Research on applied aspects of marketing in the network is reflected in the writings of such scholars as V. Aleksunin [1], T. Burenin [2], F. Gurov [4], V. Karasev [5], R. Kostiaiev [6], and I. Lytovchenko [8]. However, the issues of ensuring the effective use of the Internet in the marketing activities of enterprises remain unresolved; no due attention is paid to such components of marketing management in the network as planning and organization of processes.

The process of planning enterprise's marketing activities on the Internet begins with the formation of the basic idea of its website. To achieve this, one needs to create a unique idea of the site, of its design or sales model so that users should be able to identify it among other sites on the network. The idea proposed at this stage is the starting point for other activities and can be substantially modified further on. But, the experience of the enterprise on the Internet becomes important, in the absence of which it is expedient to spend time on its acquisition.

One of the initial stages is conducting marketing researches aimed at preparing an analysis of competitors and suitability of the company's products for sale on the network. Traditional marketing researches are the common practice, including analysis of the product and brand structure of the market, study of the demographic structure of consumers and

the specific features of their buying behavior, which allows to expand the enterprise through the use of the Internet. However, it is assumed that the firm already occupies a certain market niche, has a certain set of goods or services, and a clear idea of its target consumer.

When starting an Internet marketing activity, an enterprise should conduct a research in the network itself, when the prime task is to monitor competitors. Search engines or directories, «yellow pages» and thematic servers can be used as search tools. The study results in collecting, at least, information about the competitor's website: its name, URL, main region of activity, strengths and weaknesses of the online representation, methods used to attract visitors. This information will allow a new look at the previously developed idea of implementing the company's website, perhaps even leading to reconsider it [3].

Researching competitors in the network also allows to conclude whether the enterprise's products are suitable for sale through the network. In addition, it is worthwhile to devote some time to studying the technical capabilities of the Internet and the existing technologies in order to implement the site in general.

When defining the target consumer segment, it is necessary to make a description of the target audience, which, in the first place, will be the target of the website. It should be taken into account the level of representation of the target segment of consumers on the Internet. The next step can be making up a plan of the enterprise's advertising campaign in the network, which should be directed to users' reports about the company's presence on the Internet.

The traditional promotional activities for a website of an enterprise are as follows:

- registration in search engines of the Internet;
- placing free links to the website in directories;
- placing links on the yellow pages of the network;
- registration on thematic Jump Stations;
- placing links on other sites;
- placing advertisements on well-visited sites;
- publication on other sites of materials containing a link to the company's website;
- periodic e-mail notification of the site to all interested persons;
- participation of the enterprise in teleconferences on related topics;
- active use of mailing lists;
- wide representation of the company's website in social networks;
- use of traditional types of advertising, as well as the name of the website in all types of advertising products of the enterprise [9].

An important stage in the process of organizing the marketing activities of enterprises on the Internet is the creation of a budget, which allows to evaluate the opportunities and costs of various types of activities. In assessing costs and planning a profit, it must be taken into account that the presence of an enterprise in the network through its website can give a profit in the form of increasing brand image, product promotion, attracting new consumers, emergence of a new sales channel, improving the service for existing and potential customers, possible reduction of expenses for delivery and goods sale, packing materials or document circulation.

Developing the company's marketing system based on a website requires significant investment, i.e. funding sources should be found. One of the ways to solve the problem is to use borrowed funds with a preliminary requirement of making up a business plan for the enterprise's activities on the Internet. It should give a clear idea of the type and scope of activities, the problems that the firm may encounter during its management, as well as the expected results of activities on the network.

The business plan is designed to convince potential investors to invest in the proposed interactive project. This plan reveals the contents of traditional sections and should be based on the unique nature and properties of the network environment (Table 5.10).

Since the business plan relates to the direct business of the enterprise on the Internet, firstly it is appropriate to focus on the features of the network, and then, on the way the product (service) and the Internet are connected to each other or complement each other. When writing a business plan, it is important to know the target audience, because if the investor does not have a special training, then along with the technical terminology it is necessary to place the corresponding definitions.

The following points should also be important components of developing an enterprise's marketing plan on the Internet [6]:

1) consumers – it is necessary to determine their target segment and to find out how many people actually enter the network. There are organizations that conduct specialized demographic research and can be useful for answering such questions;

2) competitors – using search engines of the network enables to find well-known competitors or products that are similar to those proposed by the enterprise. After defining competitors, one should return to the search engines every few weeks or months, as new companies connect to the Internet. In addition, it is extremely interesting for potential investors to learn from the business plan how the enterprise plans to fight competition;

3) advertising – it is advisable to describe in detail how the enterprise intends to promote its own products or services on the Internet;

4) prices – it is worth determining the pricing policy for the enterprise's products or services. If the information about its products is disseminated through the network, then it is appropriate to try to create a pricing system to justify one's own prices or start by studying how similar products were valued by others;

5) delivery and payment – it is necessary to choose a certain system of delivery of products to customers and receive from them the corresponding payment.

Table 5.10. Structure of a business plan for organizing enterprise's marketing activities on the Internet

№	Section title	Description of the content of each section
1	Brief description	Provides a brief description of all business plan items. Partially reflects data on the potential of the Internet for the company
2	Description of activities	Contains a description of company's products / services. Provides detailed information about the industry as a whole
3	Marketing plan	Description of the target market and major competitors. Presentation of an online advertising campaign plan. Choice of mechanism of delivery of products / services to the customer. Determining the payment system and payment details
4	Research and development	Specification of certain technical details of the business project: - At what stage of development is the project? - What is needed for its successful completion? - What is the approximate cost estimate for it? - What are the future plans for conducting marketing research and taking into account the prospects of network development?
5	Operations and production	Characteristics of organisational aspects of the business, determining the employees responsible for the implementation of the project and performing work to ensure the functioning of the website. Predicted estimate of the total value of expected costs
6	Management	Who manages the business and what is their experience of dealing with the company's products on the Internet
7	Risks	Analysis of the main risks in the implementation of the business project, taking into account the specific conditions of the network
8	Finance	Justification of the profitability of the project through the definition of financial aspects in comparison with other types of activities and costs associated with the work of the enterprise on the Internet
9	Periodicity	Chronological description of all the steps appropriate to implement the business project
10	References and attachments	List of business references, Internet services and links for more information about the specific features of marketing and business activities in the network

Considerable attention needs to be given to preparing a business plan section called «Operations and Production», which describes the organizational aspects of online activities, including day-to-day operations and location; it is also necessary to determine what equipment is needed for

the enterprise to work on the network, to indicate if the enterprise's own website will be used or a site will be leased on another enterprise's website. It is also worthwhile to find out who will be responsible for the website and perform the relevant work (hire experts with work experience or train one's own employees). Besides, detailed information about the expected costs should be provided.

When defining the risks associated with the implementation of the interactive project, it is recommended to describe those that can really be encountered by the enterprise. Along with the usual business risks, such as deteriorating situation in the industry or sphere, cost increases, unforeseen actions of competitors, specific risks should be described, especially those related to the Internet (for example, probability of computer viruses, hackers' «invasion», unexpected adverse changes in policy or legislation, etc.).

The financial section of the business plan is important for potential investors as it should prove the profitability of the interactive project. It needs to include all the essential financial aspects, not forgetting the insignificant ones, compared with other types of activities, as well as the costs associated with the work of the enterprise on the Internet. In addition, the project implementers should be identified in advance [2].

It is known that the Internet is a high-tech area, therefore, one specialist or even a few specialists with a high level of qualification are needed to complete all the work. Since the Internet requires constant attention to itself to improve the company's website, it is therefore necessary to consider hiring several employees. For short-term work, third-party firms (outsourced) can be engaged to assist in web marketing and sales promotion. Spending relatively not much money can bring useful knowledge and advice from their part and still real help in realization of the planned stages of marketing activity in the network.

When creating the enterprise's website, it is advisable to go through organizational stages, starting with the research of competitors' sites for obtaining the full information and practical skills on the part of the consumer, identifying the advantages and disadvantages of the enterprise and using this information when creating one's own website (Figure 5.10).

To successfully implement the enterprise's website, the priority task is to select marketing objectives before it is placed on the network. Even after a brief acquaintance with different types of the existing sites, one can highlight the basic concepts of their construction on the basis of which one's own concept can be developed in order to meet the needs of the enterprise as fully as possible [8].

In general, in terms of firms' marketing activities, hosting Internet sites may provide for the following main goals:

- advertising, promotion of the trademark of the enterprise and / or its products;
- expansion of the system of public relations;
- providing consumers, partners, shareholders and advertising agents with complete and reliable information about the enterprise and its products;
- organization of information before and after sales support of consumers;
- providing direct sales or sales from one firm to another;
- organization of the promotion channel for its own products (if it is possible to distribute it via Internet channels).

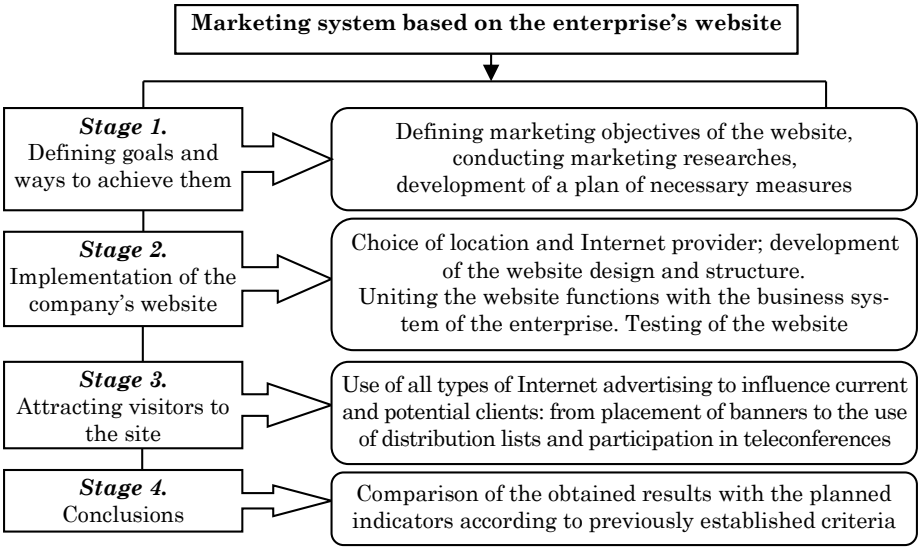

Figure 5.10. Process of creating a marketing system based on the enterprise's website
(developed on the basis [1, 5, 7])

After defining the goals of enterprise's presence on the Internet, it is worthwhile to select the criteria by which an assessment of goals achievement will be made. These criteria can be the number of visitors to the website for a certain period of time if its purpose is, for example, the development of the image of the enterprise; increasing profits over a period of time by expanding the marketing system through the Internet

and attracting more customers; increasing sales owing to the use of the Internet as a new channel for the sale of goods or services [10].

At the next stage it is necessary to determine the purpose of the website, the purpose of its creation and functioning, and to select its target audience, i.e. the existing potential customers and buyers of the company's products. If the former is more interested in support and new offers, then the second (among them those who have not yet bought the company's products) had better be told in detail what are the company's activities and what it can offer to the visitors of the website. It is also worth considering whether the website is the most effective way to achieve the company's marketing goals, since it is not expedient to immediately put too much hopes on its performance.

The next stage involves preparing information for placing on the website. To do this, the firm needs to adapt the materials of promotional leaflets, databases, press releases, product specifications. When developing a website, visitors are given the opportunity to look for information in a large database, which takes time and money. Therefore, before proceeding to the next stage, it is necessary to determine the possible actions of the target audience on the website, ways of measuring the effectiveness and information to be placed on it. It is advisable to make up an appropriate action plan to this purpose.

The next step presupposes calculation of the amount of costs and delimiting responsibilities between employees of the enterprise and other firms, as well as making the decision on whose computer the website will be located. The best solution to this is to place it on the provider's, which will be cheaper and faster, also with possibilities of technical support.

An important organizational step is the compilation of a script for the website that involves determining the quantity and quality of communication, the location of text, pictures, figures, and interactive blocks. Particular attention is paid to the first webpage that contributes to the visitors' first impression about the company's site. The logical conclusion of this phase is the preparation of the final version of the text (content) and testing on the target audience.

At the next stage it is recommended to test the entire website of the enterprise in a dialogue mode. When all the pages on the site are installed, it's worth checking out each of them and determining the time to download one page. Besides, one should check whether all the sent messages are received by the visitors of the site and whether it functions well for its own staff.

In addition, maintaining and improving the site play a significant role. After the website has started functioning, it's time to advertise it, to study visitors' reaction and to improve it on this basis. If the enterprise

wants the visitor to return to the site, they need to maintain interest to the site by regularly updating its content, making changes and add-ons, which involves additional costs for editing its structure and content [4].

Practice shows that two-level product display is more typical for websites. First of all, it is the placement of simple information (logo, contact information, basic information about the company, its goods and services). For most firms, marketing at such a level does not bring the desired level of profit. Secondly, it is the presentation on the enterprise's website of specific and entertaining information. The consumer is pleased with visiting such a site, which is an important stage in interactive marketing, especially if the firm intends to turn the visitors of the website into its regular customers.

With the qualitative organization of work on the development of a marketing system on the Internet, it has to improve and expand. Once completed the first results, one needs to adjust the overall goals of the website using the network resources, that is, to review the tasks of the first stage. In case of insufficient performance of the website due to unsuccessful design or small number of visitors it is necessary to return to the second and third stage for making corrections. Significant changes in the initial plans can be imposed by the very Internet environment, the high dynamics of which requires continuous improvement of methods and means of interaction with it on the part of the enterprise.

Thus, planning and organization of marketing activities on the Internet is the basis for developing an interactive system for managing the marketing of the enterprises in the network and passing the relevant stages of the implementation of various types of work. The result of all stages of this process is the creation, placement and promotion of the enterprise's website on the Internet as one of the effective tools for implementing the entire marketing programme.

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Section 6

Logistic support of enterprises innovative development

Transport, transit and personnel potentials in logistic support of innovative distribution system: essence and evaluation[3]

Bilovodska O.A., Niño-Amézquita J., Zielińska A.

To form an economically reasonable marketing policy for the distribution of industrial enterprises, we consider it compulsory to take into account not only the level of marketing resources' development at the enterprises in the region, but also the level of its logistic support, since this will allow an enterprise to further integrate successfully in the regional supply chain. These resources provide the identification of their security level by means of any types that allow to form an effective system of ideas and goods (services) creation, their pricing, promotion, distribution, which promote the image and loyalty of consumers (proposed by the author in [32]).

In our opinion, *the logistic potential of the region* is a combination of existing and potentially possible elements and factors of logistic infrastructure that are involved in the formation and distribution of material and related accompanying flows. At the same time, the formation and use of such potential is intended to ensure the timely and efficient transfer of logistic resources at a minimum cost.

Taking into account an international experience [33] and based on the approach proposed by O.A. Freidman [31], in our opinion, the structure of logistic potential, which influences the validity of the decision when forming the enterprise distribution system, within the analyzed region contains:

- transport potential;
- personnel potential;
- transit potential;
- consumer and sales potential;
- service potential;
- potential of the attractiveness of economic-geographical position, or spatial potential.

[3] The publication contains the results of studies conducted by President's of Ukraine grant for competitive projects F70 of the State Fund for Fundamental Research («Formation of the management mechanism of products' distribution at the industrial enterprises on the innovative basis», № SR 0117U001682)

We will consider in detail transport, personel and transit component of the structure of the logistic potential in the region and, based on the statistical data of each Ukrainian region on the results of 2010-2015, we will analyze their level.

In our opinion, *transport potential* is the capacity of the transport system in the region, which reflects the availability and number of rolling stock of the different means of transport, the length of the transport network, the number of the infrastructure objects to provide various types of transportation, etc. We will analyze the dynamics of the transport potential indicators of the regions of Ukraine for 2010-2015 (Figure 6.1-9, Table 6.1).

As you can see, not all regions of Ukraine have tram transport. Tram carriages are provided in Vinnytsia, Dnipropetrovsk, Donetsk, Zhytomyr, Luhansk, Lviv, Mykolaiv, Odessa, Sumy, Kharkiv regions and in Kyiv. At the same time, the largest number is in the Dnipropetrovsk region and in Kyiv, and the smallest – in Sumy, Luhansk and Zhytomyr regions, and from 2010 to 2015 there is a general tendency towards their insignificant decrease (Figure 6.1).

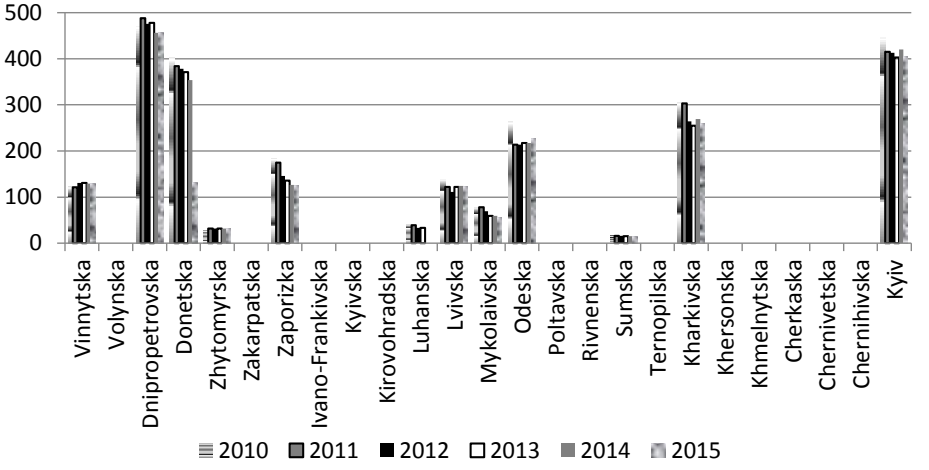

Figure 6.1. The number of tram cars in Ukrainian regions, units, 2010-2015 (based on [29])

An analysis of the provision of Ukrainian regions by trolleybuses in 2010-2015 (Figure 6.2) demonstrates different trends: in Vinnytsya, Zhytomyr, Mykolaiv and Ternopil regions there is their increase; in the regions of Dnipropetrovsk, Donetsk, Zaporizhia, Kyiv, Luhansk, Poltava, Kharkiv, Kherson, Khmelnytskyi, Cherkasy, Chernivtsi, Chernihiv regions and Kyiv, there is a decrease, in other regions it is more or less constant, and Zakarpattia region does not have trolleybus connections.

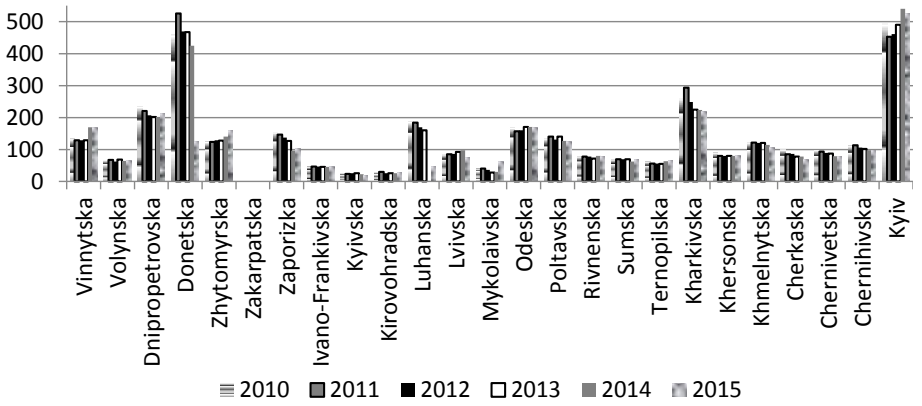

Figure 6.2. The number of trolleybus cars in Ukrainian regions, units, 2010-2015 (based on [29])

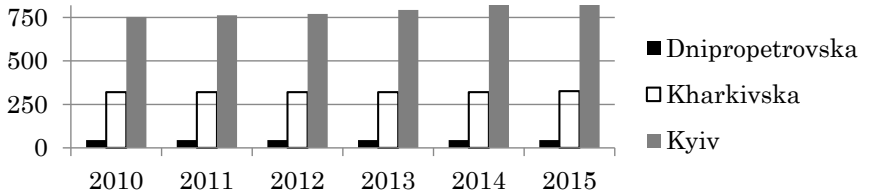

Figure 6.3. The number of underground carriages in Ukrainian regions, units, 2010-2015 (based on [29])

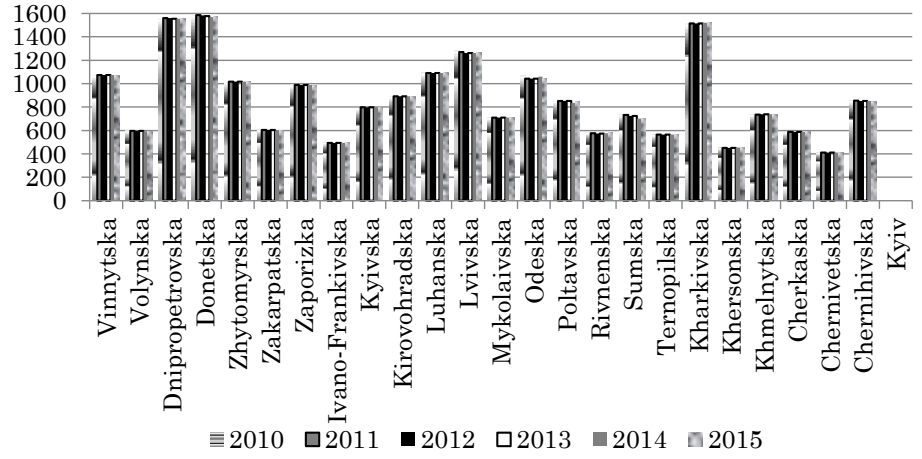

Figure 6.4. The operational length of railways in Ukrainian regions, kilometers, 2010-2015 (based on [29])

The number of underground carriages (Figure 6.3) in the Dnipropetrovsk region from year to year is unchanged at 45 units, in Kharkiv region from 2010 to 2014 – 321 units, and in 2015 – 326 units, in Kyiv, this the figure is increasing: in 2010 – 753 units, in 2011 – 762 units, in 2012 – 770 units, in 2013 – 794 units, in 2014 – 824 units, in 2015 – 824 units [29].

As we see from Figures 6.4-8 all regions of Ukraine have more or less stable indicators of length for all modes of transport.

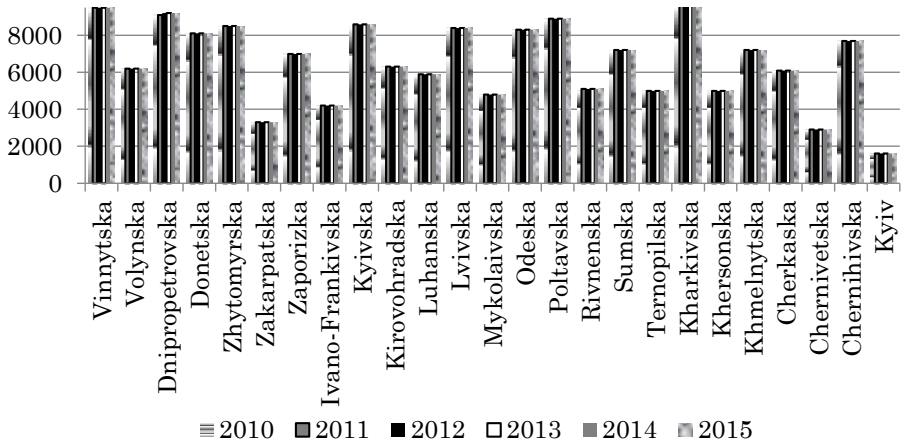

Figure 6.5. The length of highways in Ukrainian regions, kilometers, 2010-2015 (based on [29])

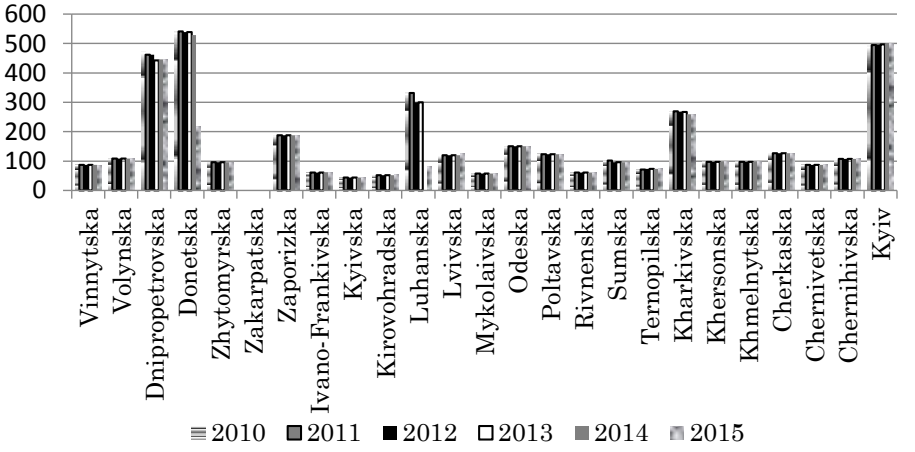

Figure 6.6. The operational length of trolleybus lines in Ukrainian regions, kilometers, 2010-2015 (based on [29])

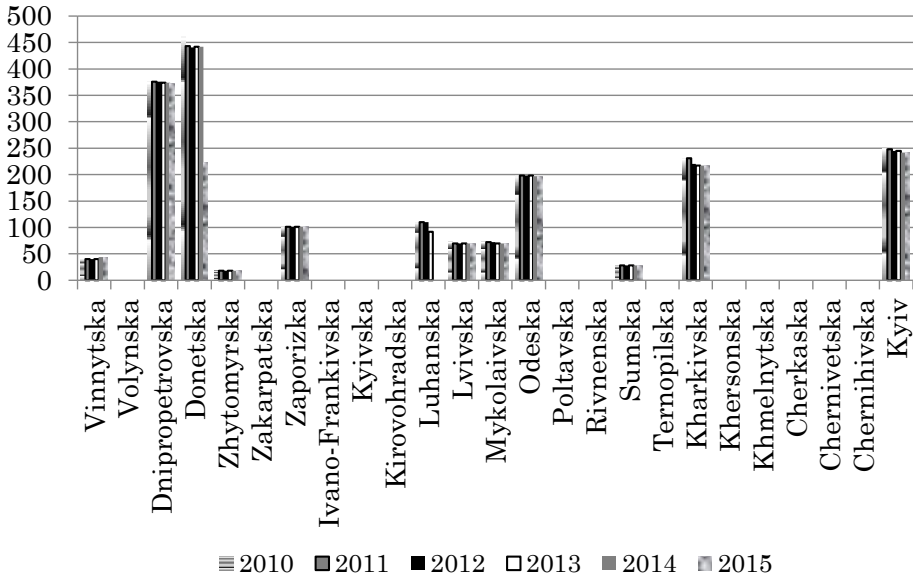

Figure 6.7. The operational length of tram rails in Ukrainian regions, kilometers, 2010-2015 (based on [29])

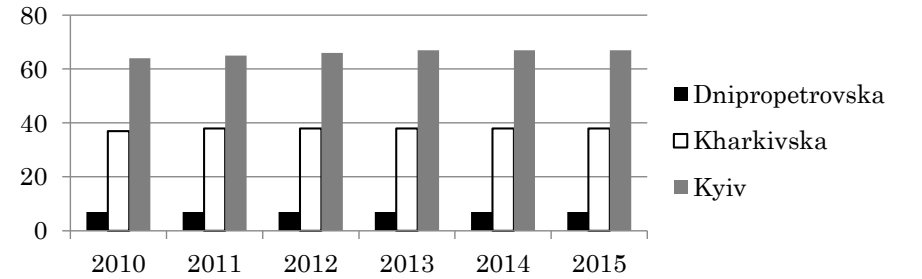

Figure 6.8. The operational length of underground tracks in Ukrainian regions, kilometers, 2010-2015 (based on [29])

Thus, there are no significant changes from year to year in 2010-2015 for each component of the transport potential in the regions of Ukraine. At the same time, the tendency towards a decrease is demonstrated by the number of trams, while an indicator of the number of petrol stations is showing an increase.

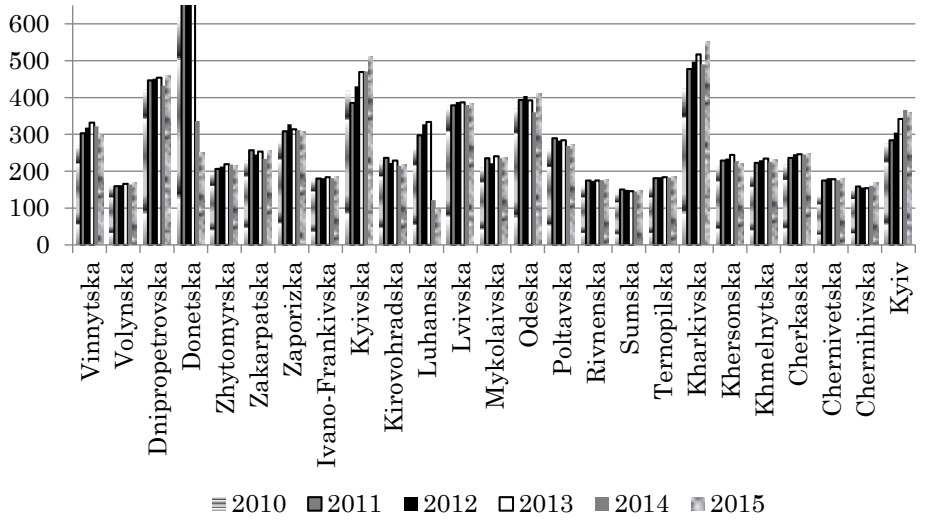

Figure 6.9. The number of petrol stations in Ukrainian regions, units, 2010-2015 (based on [29])

The leaders in the number of trams are the Dnipropetrovsk region, the city of Kyiv and the Donetsk region, trolleybuses – Kyiv, Donetsk, Kharkiv and Dnipropetrovsk regions, petrol stations – Donetsk, Kharkiv, Kyiv and Dnipropetrovsk regions, according to the indicator of the operational length of railways – Donetsk , Dnipropetrovsk and Kharkiv regions, highways – Kharkiv, Vinnitsa, Dnipropetrovsk and Poltava regions, trolleybus lines – Kyiv, Donetsk and Dnipropetrovsk regions, tram tracks – Donetsk and Dnipropetrovsk regions, the city of Kyiv, Kharkiv and Odessa regions.

We propose to determine the ranking of Ukrainian regions in terms of transport potential by the average values for the analyzed period of each of its components (Table 6.1).

Summing up, it should be noted that according to the results of the integrated rating of the regions of Ukraine according to the level of development of transport potential, Dnipropetrovsk, Kharkiv and Donetsk regions are the leading ones (highlighted in the table 1 in the bold cell borders), while Ivano-Frankivsk, Zakarpattia, Chernivtsi and Ternopil regions are outsiders (highlighted by shading in the Table 6.1).

Table 6.1. Average values of transport potential indicators in Ukrainian regions for 2010-2015 and their ranking* (developed by the author)

Regions of Ukraine	Number of tram cars units	Ranking	Number of trolleybus carriages, units	Ranking	Number of under-ground carriages,	Ranking	Operational length o railways, km	Ranking	Length of highways, km	Ranking	Operational length o trolleybus lines, km	Ranking	Operational length o tram reails, km	Ranking	Operational length of ndergroud tracks, km	Ranking	Number of petrol stations, units	Ranking	General ranking**	Integral ranking
Vinnytska	127	7	143	7	0	4-25	1074	6	9500	2	86,8	18	41,3	10	0	4-25	307	9	67-109	7-8
Volynska	0	13-25	66	19	0	4-25	595,7	18	6200	15	109	11	0	13-25	0	4-25	163	23	120-186	18-19
Dnipropetrovska	471	1	213	4	45	3	1556,7	2	9167	3	455,3	3	375	2	7	3	444	4	25	1
Donetska	337	3	412	2	0	4-25	1579,7	1	8100	9	484,5	2	408,8	1	0	4-25	533	1	27-69	3
Zhytomyrska	31	11	134	8	0	4-25	1016	8	8500	6	96	16	18	12	0	4-25	211	18	87-129	11
Zakarpatska	0	13-25	0	25	0	4-25	603,3	17	3300	23	0	25	0	13-25	0	4-25	245	11	135-201	24
Zaporizka	149	6	127	10	0	4-25	989,2	9	7000	13	188	6	101	7	0	4-25	309	8	67-109	7-8
Ivano-Frankivska	0	13-25	46	21	0	4-25	494,2	22	4150	22	61,2	20	0	13-25	0	4-25	182	19	138-204	25
Kyiv	417	2	494	1	788	1	-	25	1617	25	497,0	1	245,3	3	66,0	1	322	7	66	5
Kyivska	0	13-25	24	24	0	4-25	797,0	13	8583	5	44,0	24	0	13-25	0	4-25	447	3	103-169	13-14
Kirovohradska	0	13-25	27	23	0	4-25	892,3	10	6300	14	52,2	23	0	13-25	0	4-25	225	16	120-186	18-19
Luhanska	37	10	149	6	0	4-25	1092,0	5	5900	17	269,4	4	105,5	6	0	4-25	240	12-13	68-111	9
Lvivska	124	8	87	14	0	4-25	1266,2	4	8400	7	120,5	10	70,5	9	0	4-25	382	6	66-108	6
Mykolaivska	66	9	39	22	0	4-25	711,0	16	4800	21	58,0	22	71,2	8	0	4-25	230	14	120-162	17
Odeska	226	5	166	5	0	4-25	1050,8	7	8300	8	150,0	7	197,7	5	0	4-25	388	5	50-92	4
Poltavska	0	13-25	133	9	0	4-25	849,2	12	8900	4	123,2	9	0	13-25	0	4-25	276	10	78-144	10
Rivnenska	0	13-25	77	17	0	4-25	577,8	20	5083	18	61,0	21	0	13-25	0	4-25	173	21	131-197	21
Sumska	16	12	68	18	0	4-25	720,7	15	7200	11	98,0	13	28,0	11	0	4-25	147	25	113-155	16
Ternopilska	0	13-25	60	20	0	4-25	564,0	21	5000	19-20	72,8	19	0	13-25	0	4-25	179	20	133-200	22-23
Kharkivska	276	4	245	3	322	2	1516,3	3	9600	1	265,3	5	222,3	4	37,8	2	493	2	26	2
Khersonska	0	13-25	82	16	0	4-25	452,3	23	5000	19-20	97,0	14-15	0	13-25	0	4-25	228	15	121-189	20
Khmelnytska	0	13-25	117	11	0	4-25	737,7	14	7200	12	97,0	14-15	0	13-25	0	4-25	223	17	102-169	12
Cherkaska	0	13-25	83	15	0	4-25	588,0	19	6100	16	127,0	8	0	13-25	0	4-25	240	12-13	104-171	15
Chernivetska	0	13-25	87	13	0	4-25	413,0	24	2900	24	87,0	17	0	13-25	0	4-25	171	22	134-200	22-23
Chernihivska	0	13-25	104	12	0	4-25	852,7	11	7700	10	106,3	12	0	13-25	0	4-25	158	24	103-169	13-14

** – the cell's bold boundaries highlighted the best integral values of the region's indicators, and shading is the worst;*
*** – calculated as the sum of the values of ratings for each indicator*

Transit potential is the volume of freight traffic and passenger traffic passing through the territory by different means of transport, as well as the amount of transit cargo transported on the territory in accordance with the terms of the contract, etc. The dynamics of indicators of this potential by regions of Ukraine in 2010-2015 is shown in Figures 6.10-6.13.

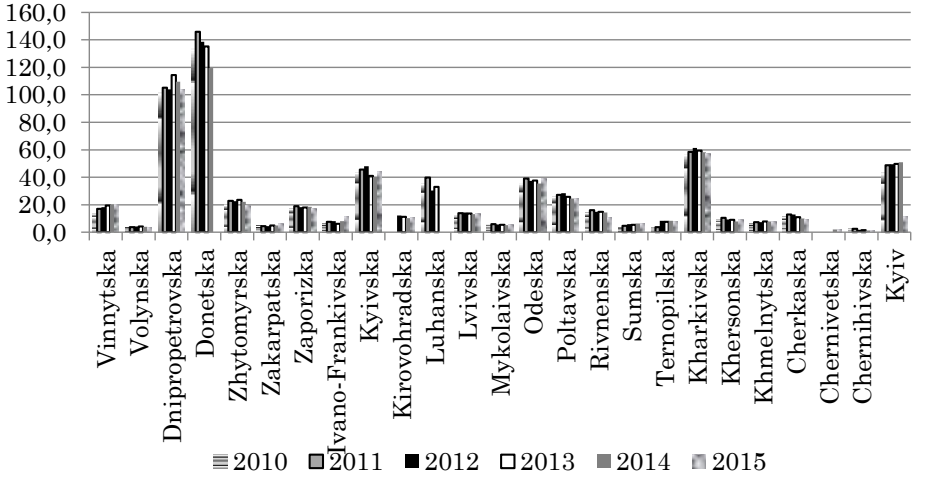

Figure 6.10. Transported (shipped) cargoes by all types of transport in Ukrainian regions, million tons, 2010-2015 (based on [1-26, 29, 30])

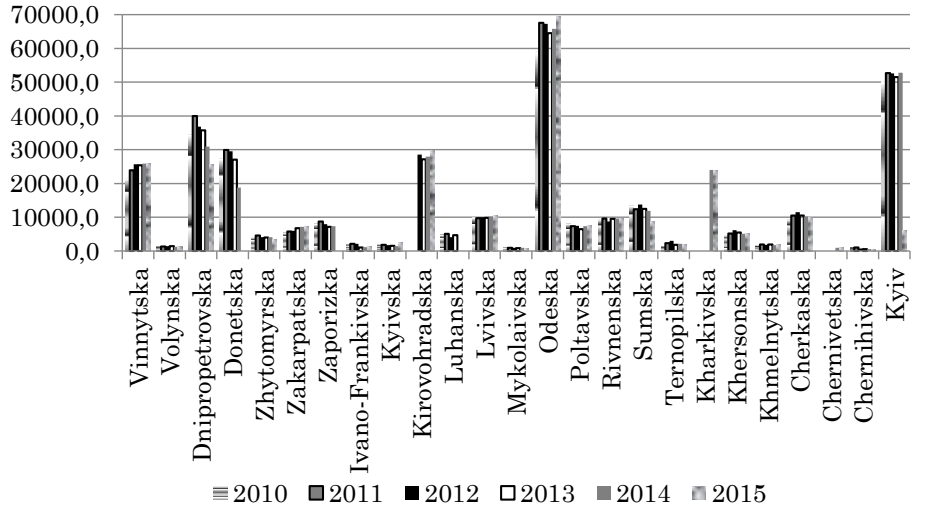

Figure 6.11. Cargo turnover by all types of transport in Ukrainian regions, million tkm, 2010-2015 (based on [1-26, 29, 30])

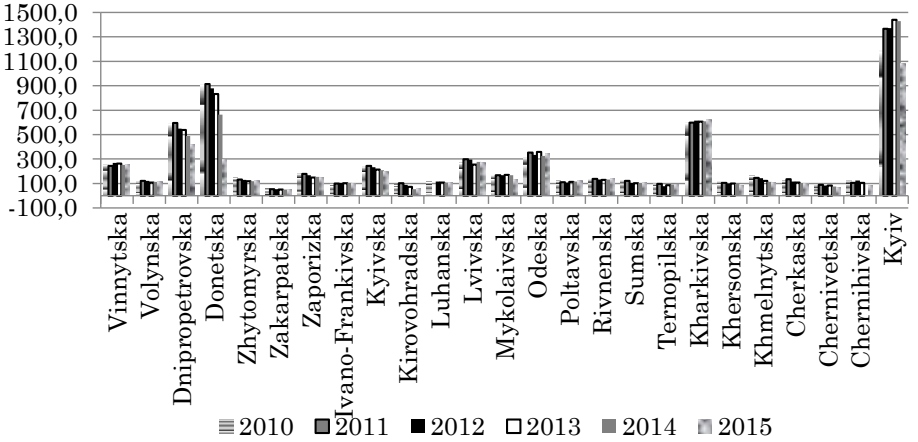

Figure 6.12. Transported (departed) passengers by all types of transport in Ukrainian regions, million pass., 2010-2015 (based on [1-26, 29, 30])

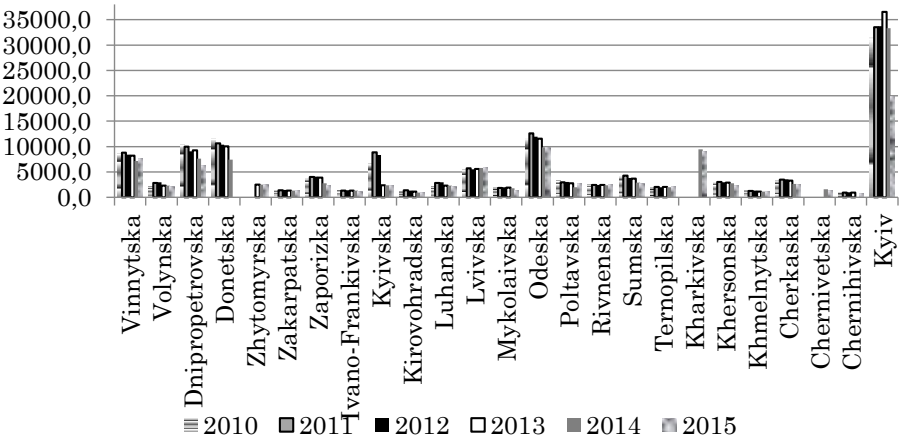

Figure 6.13. Passenger traffic by all types of transport in Ukrainian regions, million pas. Km, 2010-2015 (based on [1-26, 29, 30])

Thus, the leaders in the carriage of cargo goods are Donetsk, Dnipropetrovsk and Kharkiv regions, of the cargo turnover – Odessa region, Kyiv and Dnipropetrovsk region, of transportation of passengers – Kyiv, Donetsk and Kharkiv regions, of the passenger traffic – Kyiv, Odesa and Donetsk regions.

We propose to determine the rating of the regions of Ukraine for the transit potential according to the average values for the analyzed period of each of its components (Table 6.2).

Table 6.2. Average values of transit potential indicators in Ukrainian regions for 2010-2015 and their rating* (developed by the author)

Regions of Ukraine	Transported cargo, mln t	Ranking	Cargo Turnover, mln tkm	Ranking	Transported passengers, mln	Ranking	Passenger traffic, mln	Ranking	General ranking**	Integral ranking
Vinnytska	18,1	10	24737,9	6	257,1	7	8122,0	6	29	6
Volynska	3,8	23	1352,8	22	116,4	14	2415,6	16	75	20
Dnipropetrovska	106,4	2	33911,5	3	530,9	4	8781,9	5	14	3-4
Donetska	134,6	1	26539,6	5	749,3	2	10024,7	3	11	2
Zhytomyrska	21,8	9	4029,6	17	128,6	13	2501,6	14	53	13
Zakarpatska	4,9	22	6398,9	14	53,2	25	1370,1	21	82	23
Zaporizka	18,0	11	7847,7	12	162,7	10	3457,6	10	43	9
Ivano-Frankivska	7,9	17	1618,5	21	101,7	20	1297,0	22	80	22
Kyiv	42,2	5	44311,9	2	1313,1	1	31380,8	1	9	1
Kyivska	43,7	4	1862,9	19	223,0	8	5152,3	8	39	8
Kirovohradska	11,0	15	28326,8	4	77,3	24	1132,0	24	67	17
Luhanska	34,6	7	4680,9	16	111,9	17	2415,3	17	57	15
Lvivska	13,5	13	10030,9	10	278,8	6	5634,6	7	36	7
Mykolaivska	5,5	20	890,5	24	162,7	9	1813,1	19	72	18
Odeska	37,5	6	65609,8	1	338,7	5	11241,3	2	14	3-4
Poltavska	26,0	8	7355,9	13	115,0	15	2759,2	13	49	10-11
Rivnenska	14,2	12	9422,4	11	134,2	11	2451,9	15	49	10-11
Sumska	5,3	21	12132,0	8	111,5	18	3597,1	9	56	14
Ternopilska	6,4	19	2127,2	18	91,3	22	2025,5	18	77	21
Kharkivska	58,6	3	23880,4	7	609,7	3	9256,5	4	17	5
Khersonska	9,1	16	5311,1	15	101,6	21	2835,7	12	64	16
Khmelnytska	7,4	18	1831,5	20	133,6	12	1229,6	23	73	19
Cherkaska	11,2	14	10344	9	112,4	16	3143,2	11	50	12
Chernivetska	1,9	24	965,6	23	80,9	23	1479,7	20	90	24
Chernihivska	1,8	25	749,8	25	109,3	19	931,1	25	94	25

** – the cell's bold boundaries highlighted the best integral values of the region's indicators, and shading is the worst;*
*** – calculated as the sum of the values of ratings for each indicator*

Thus, according to the results of ranking of the regions of Ukraine in terms of the level of development of transit potential, the cities of Kyiv, Donetsk, Dnipropetrovsk and Odessa regions are leaders (highlighted in the bold cell borders in Table 6.2), while Chernihiv, Chernivtsi and Zakarpattia regions are outsiders (highlighted by shading in Table 6.2).

Personnel potential – reflects the ability to provide logistics infrastructure by its own specialists of different levels and profile, as well as to explore and analyze logistics systems and processes, develop programs for their improvement, etc. The list of indicators in the structure of human resources includes the number of Doctors and Ph.Ds in economy (Figures 6.14-15), the number and level of the employed and the unemployed, incl. the registered population (Figures 6.16-21), the demand for labor and the

load on one vacancy (Figures 6.22-23), as well as the employment of registered unemployed persons (Figure 6.24) and the average number of full-time employees of transport and warehousing enterprises (Figure 6.25).

Analyzing the number of Doctors and Ph.Ds in economy (Figures 6.14-15), we observe relative stability with a tendency to increase in this indicator, except Donetsk and Luhansk regions, where there is a decrease due to the events in the ATO territory.

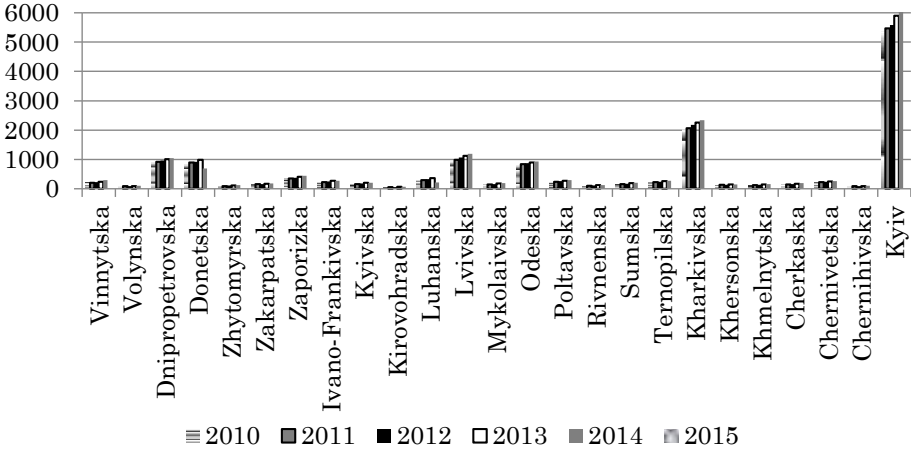

Figure 6.14. The number of Doctors of Science in economy in Ukrainian regions, persons, 2010-2015 (based on [28])

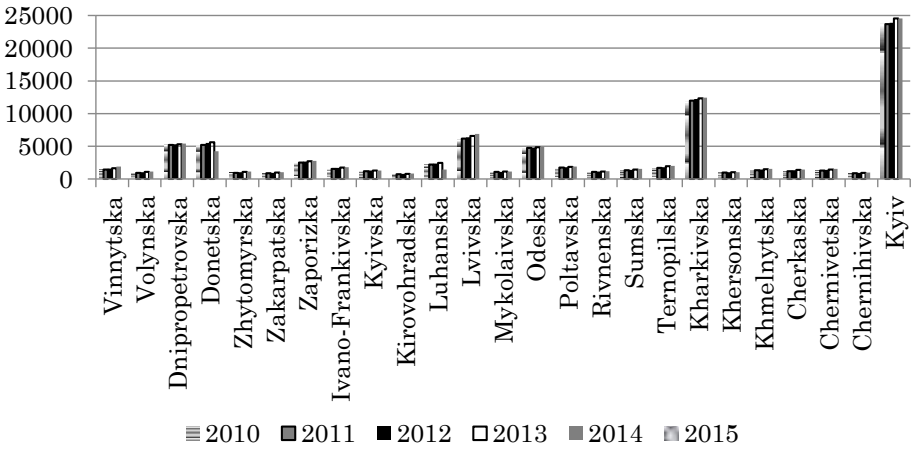

Figure 6.15. The number of Ph.Ds in economy in Ukrainian regions, persons, 2010-2015 (based on [28])

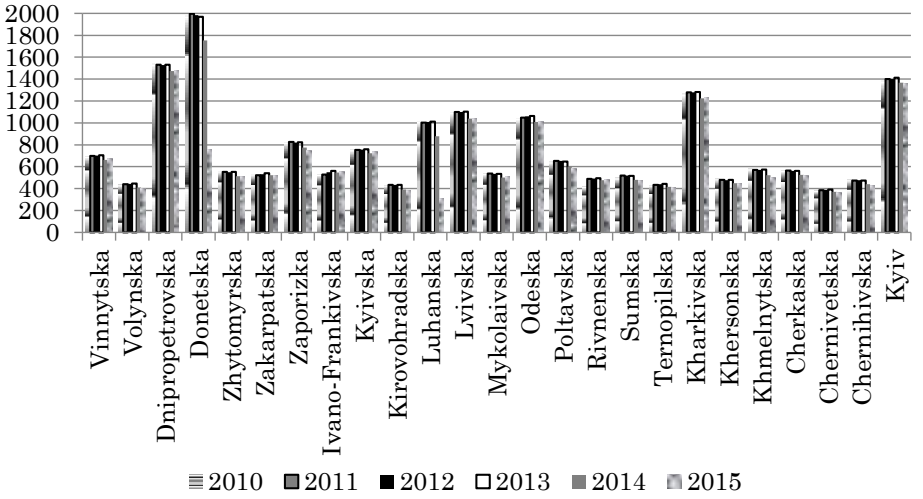

Figure 6.16. The number of employed people in Ukrainian regions, thousand people, 2010-2015 (based on [27])

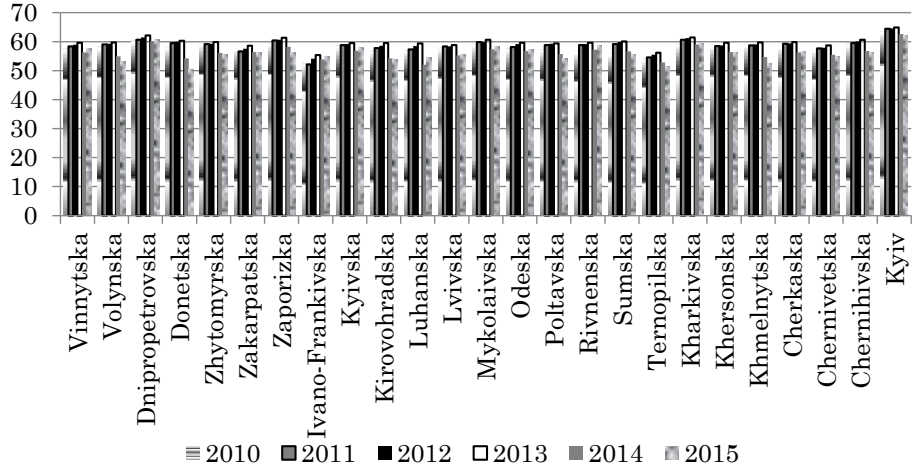

Figure 6.17. The employment rate in Ukrainian regions, %, 2010-2015 (based on [27])

Analyzing the indicators of employment and unemployment (Figures 6.16-6.21), we observe the opposite tendencies to a slight decrease in the number of employed population and the growth of unemployment in all regions of Ukraine, except for Vinnytsia, Dnipropetrovsk, Ivano-Frankivsk, Kyiv, Lviv, Mykolaiv, Odesa, Rivne, Kharkiv regions, where

in 2015 there is an improvement in the indicators. At the same time, in Volyn, Zhytomyr, Zakarpattia, Cherkasy, Chernihiv regions, all indicators of both employment and unemployment are reduced, while in Ivano-Frankivsk, on the contrary, the increase of registered unemployment occurs only in Volyn and Zhytomyr regions.

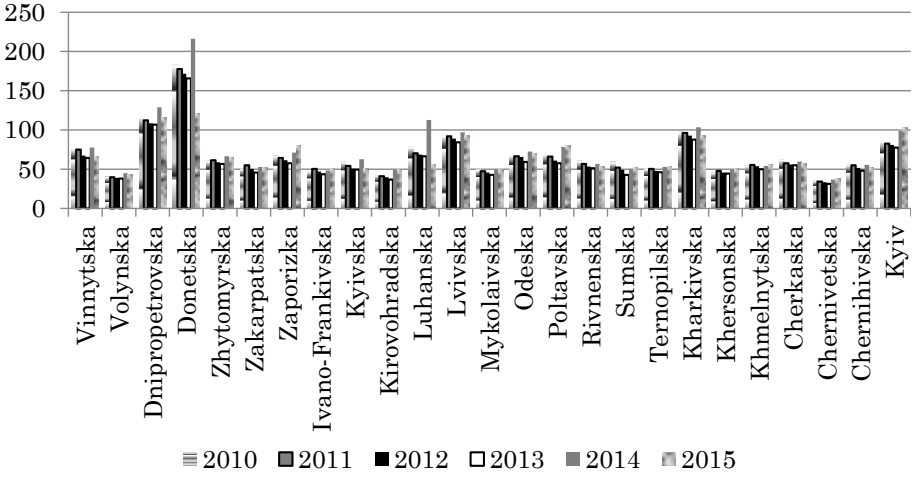

Figure 6.18. The number of unemployed people in Ukrainian regions, thousand people, 2010-2015 (based on [27])

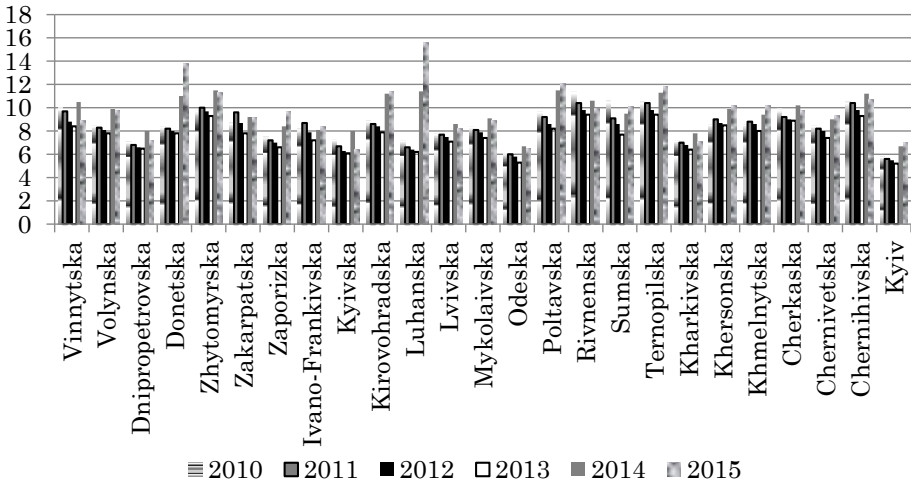

Figure 6.19. The unemployment rate in Ukrainian regions, %, 2010-2015 (based on [27])

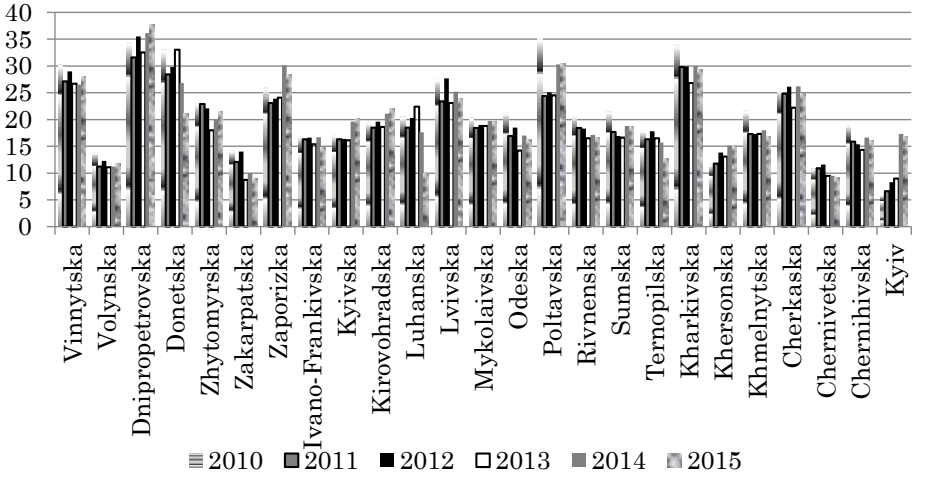

Figure 6.20. The number of registered unemployed people in Ukrainian regions, thousand people, 2010-2015 (based on [27])

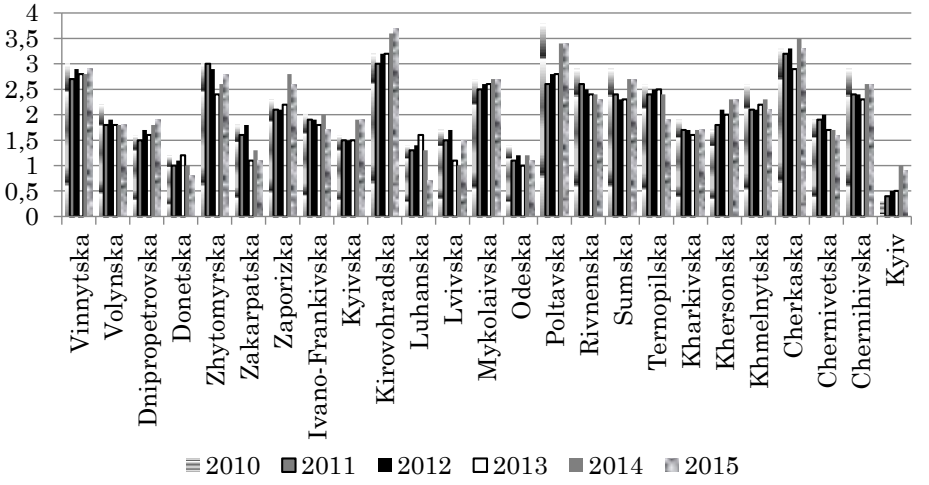

Figure 6.21. The level of registered unemployed in Ukrainian regions, %, 2010-2015 (based on [27])

The demand for workers is increasing in Volyn, Ivano-Frankivsk, Khmelnytskyi and Cherkasy regions, and is almost stable in Kirovohrad, Mykolaiv, Sumy and Ternopil regions, when in others it is decreasing, while it is very significant in Kyiv, Dnipropetrovsk, Donetsk, Kyiv, Lviv, Luhansk, Odessa, Kharkiv and Kherson regions (Figure 6.22).

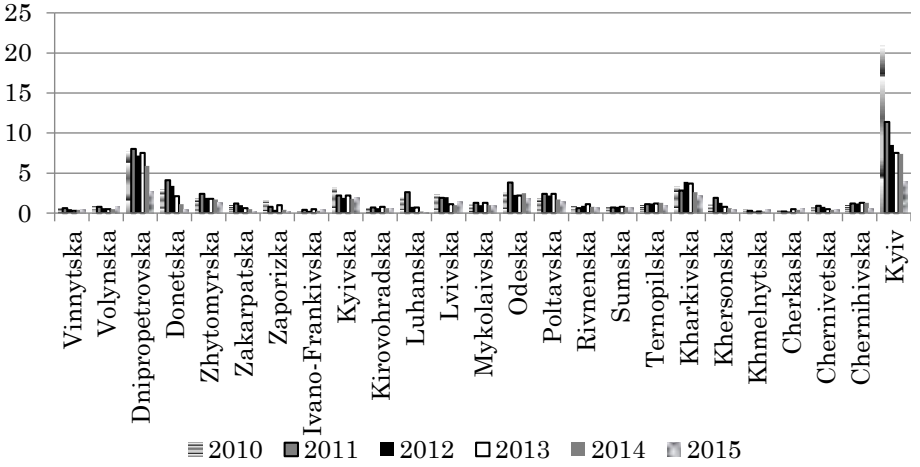

Figure 6.22. The demand for labor in Ukrainian regions, thousand people, 2010-2015 (based on [27])

The load on one vacancy in the regions of Ukraine is rapidly fluctuating from year to year, and only in Kyiv, Zhytomyr, Mykolaiv, Odesa, and Kharkiv regions shows some stability (Figure 6.23).

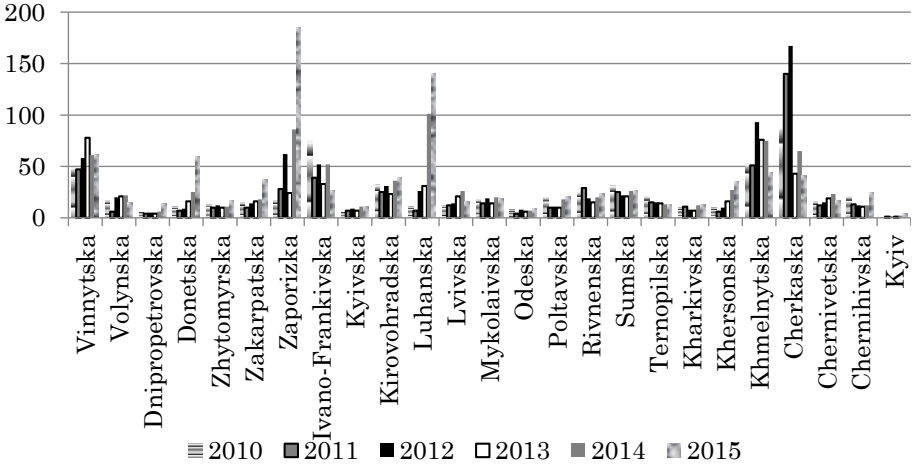

Figure 6.23. The load on one vacancy (vacant position) (average per year) in Ukrainian regions, persons, 2010-2015 (based on [27])

The employment of registered unemployed (on average per year) in the regions of Ukraine from 2010 to 2012 is increasing, with the

exception of Donetsk, Luhansk, Ternopil, Khmelnytskyi, Cherkasy, Chernivtsi regions, where the decrease begins already in 2012. This indicator is growing somewhat in 2014 in Vinnytsia, Volyn, Kirovohrad, Lviv, Poltava and Kharkiv regions and in Kyiv, and in 2015 - in the Dnipropetrovsk and Chernihiv regions, and positive dynamics are maintained only in Kyiv (Figure 6.24).

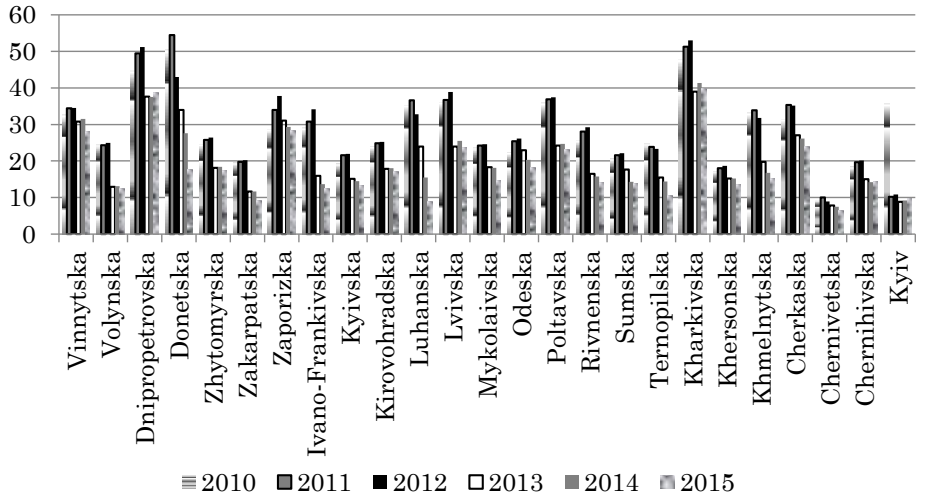

Figure 6.24. The employment of registered unemployed (on average per year) in Ukrainian regions, thousand people, 2010-2015 (based on [27])

The analysis of the number of full-time employees of transport and warehousing enterprises for the analyzed period shows an average decrease, but in Dnipropetrovsk and Poltava regions we observe growth (Figure 6.25).

Thus, the leaders in the number of Doctors and Ph.Ds in Economics are Kyiv, Kharkiv and Lviv regions, the employed population – Donetsk, Dnipropetrovsk regions and Kyiv, by the level of employment – Kyiv, Dnipropetrovsk and Kharkiv regions, by the number of indicators the unemployed – Chernivtsi, Volyn and Kirovohrad regions, according to the unemployment rate – Kyiv, Odesa and Kyiv regions, by the number of registered unemployed – Chernivtsi region, Kyiv and Zakarpattya region, the level of registered unemployed – Kyiv, Donetsk and Odesa regions, for the demand for labor force and load for one job – Kyiv, Dnipropetrovsk and Kharkiv regions, for employment of registered unemployed – Dnipropetrovsk, Donetsk and Vinnitsa regions, according to

the number of full-time employees of transport and warehousing enterprises – Kiev, Donetsk and Odessa regions.

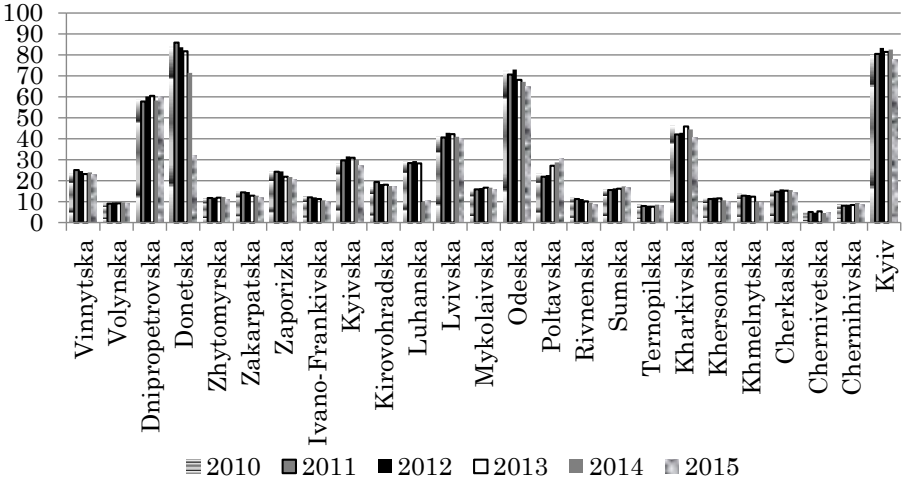

Figure 6.25. The average number of employees of enterprises of transport and storage facilities in Ukrainian regions, thousand people, 2010-2015 (based on [27])

We propose to determine the ranking of regions of Ukraine for personnel potential by the average values for the analyzed period of each of its components (table 6.3).

Thus, according to the results of rating of the regions in Ukraine in terms of the level of personnel potential development, Kyiv, Odesa and Dnipropetrovsk regions are leaders (highlighted in bold cell borders in the table 3), while Kirovohrad, Cherkasy and Rivne regions are outsiders (highlighted by shading in the Table 6.3).

The total result of the conducted research is to determine the ranking of the regions in Ukraine by the level of all potentials, which is given in the Table 6.4.

Table 6.3. Average values of personnel potential indicators in Ukrainian regions for 2010-2015 and their ranking* (developed by the author)

Regions of Ukraine	Doctors	Ranking	PhDs	Ranking	Employed, thsd people	Ranking	Employment rate, %	Ranking	Unemployed, thsd people	Ranking	Unemployment rate, %	Ranking	Registered unemployed, thsd people	Ranking	Level of registered unemployed, %	Ranking	Demand for labor force, thsd people	Ranking	Load on one vacancy, persons	Ranking	Employment of registered unemployed, thsd people	Ranking	Employees of transport and storage facilities, thsd people	Ranking	General ranking**	Integral ranking
Vinnytska	2366	12	1610	12	689,2	10	58,1	11-12	71,3	19	9,4	17-18	27,9	21	2,9	22	0,5	22	59,2	22	32,0	3	23,8	9	180-182	17
Volynsk	90	23-24	1014	23	428,3	22	57,4	16-17	40,9	2	8,7	11	11,9	4	1,9	11-12	0,8	15-16	16,8	10-11	18,7	16-17	9,3	22	175-181	16
Dniprop trovska	966	4	5298	4	1514,2	2	60,9	2	114,9	24	7,0	4	34,6	25	1,7	7-9	6,5	2	6,3	3	43,2	1	59,3	4	82-84	3
Donetska	866	6	5141	6	1740,2	1	57,1	20	172,6	25	9,5	19-20	28,7	23	1,1	2	2,3	5	21,3	16	37,9	2	73,1	2	127-128	7
Zhytomyrska	106	22	1020	22	539,6	15	58,3	8-10	61,5	15	10,3	22-24	21,3	17	2,8	21	1,8	8	12,2	6	21,8	12	11,7	18	186-190	20
Zakarpaska	162	16	927	16	527,9	16	57,2	19	51,2	9	8,9	12-14	11,3	3	1,5	6	0,7	17-20	18,3	15	15,3	22	13,6	16	167-172	13
Zaporizka	388	7	2613	7	802,5	8	59,4	4	67,0	16	7,7	6	25,9	20	2,3	15	0,7	17-20	67	24	31,6	4	22,9	10	138-141	8
Ivano-Frankivska	249	10	1660	10	546,2	14	53,8	25	48,0	6	8,1	8	16,1	6	1,9	11-12	0,4	23-24	46,2	20	22,7	10	11,4	19	162-164	12
Kyiv	5672	1	24089	1	1387,9	3	63,7	1	88,0	21	6,0	1	10,7	2	0,6	1	10,0	1	1,6	1	14,1	23	80,9	1	57	1
Kyivska	181	14	1252	14	748,7	9	58,5	7	54,6	12	6,8	3	17,6	10	1,7	7-9	2,2	6	8,3	5	17,6	19	29,6	7	113-115	6
Kirovohradska	61	25	769	25	418,3	24	56,8	22	43,2	3	9,4	17-18	19,9	16	3,3	24-25	0,7	17-20	31,0	19	21,2	14	17,9	12	218-223	25
Luhanska	299	8	2115	8	870,4	7	56,5	23	75,5	20	8,9	12-14	18,2	13	1,3	4	1,1	10-13	52,7	21	25,5	8	22,6	11	145-150	9
Lvivska	1064	3	6410	3	1079,9	5	57,4	16-17	91,5	22	7,8	7	25,2	19	1,4	5	1,6	9	16,8	10-11	30,8	5	41,3	6	110-112	5
Mykolaivska	160	18	1093	18	525,4	17	59,2	5	47,4	4-5	8,3	9	19,3	15	2,6	19-20	1,1	10-13	17,3	13-14	20,6	15	16,1	14	157-163	11
Odeska	868	5	4811	5	1040,6	6	58,1	11-12	67,1	17	6,1	2	17,4	9	1,2	3	2,5	4	7,0	4	22,5	11	69,4	3	80-81	2
Poltavska	257	9	1792	9	631,1	11	57,5	15	68,9	18	9,9	21	28,3	22	3,1	23	2,0	7	15,0	7	30,4	6	25,7	8	156	10
Rivnenska	107	21	1114	21	476,3	19	58,3	8-10	55,5	13	10,3	22-24	18,0	11	2,5	17-18	0,8	15-16	22,0	17	21,6	13	10,4	21	198-204	23
Sumska	174	15	1410	15	500,6	18	57,9	14	51,1	8	9,3	16	18,3	14	2,6	19-20	0,7	17-20	25,3	18	18,3	18	16,3	13	185-189	19

Table 6.3. Continuation

Regions of Ukraine	Doctors	Ranking	PhDs	Ranking	Employed, thsd people	Ranking	Employment rate, %	Ranking	Unemployed, thsd people	Ranking	Unemployment rate, %	Ranking	Registered unemployed, thsd people	Ranking	Level of registered unemployed, %	Ranking	Demand for labor force, thsd people	Ranking	Load on one vacancy, persons	Ranking	Employment of registered unemployed, thsd people	Ranking	Employees of transport and storage facilities, thsd people	Ranking	General ranking**	Integral ranking
Ternopilska	243	11	1805	11	428,2	23	54,2	24	50,4	7	10,5	25	16,2	7-8	2,4	16	1,1	10-13	15,2	8	18,7	16-17	8,1	24	182-187	18
Kharkivska	2171	2	1216 7	2	1261,0	4	60,2	3	95,3	23	7,1	5	30,0	24	1,7	7-9	3,1	3	3,1	2	10,2	24	43,7	5	104-106	4
Khersonska	138	19	1011	19	470,6	20	58,0	13	47,4	4-5	9,2	15	13,4	5	2,0	13	1,0	14	17,3	13-14	16,3	21	11,2	20	176-178	15
Khmelnytska	136	20	1436	20	553,4	12	57,3	18	54,1	11	8,9	12-14	18,1	12	2,2	14	0,3	25	65,3	23	25,1	9	11,9	17	193-195	21
Cherkaska	161	17	1287	17	550,7	13	58,3	8-10	57,9	14	9,5	19-20	25,0	18	3,3	24-25	0,4	23-24	90,8	25	29,8	7	15,2	15	200-205	24
Chernivetska	233	13	1384	13	380,7	25	57,0	21	34,9	1	8,4	10	10,2	1	1,8	10	0,6	21	17,0	12	8,3	25	4,9	25	177	14
Chernihivska	90	23-24	906	24	462,7	21	58,7	6	53,0	10	10,3	22-24	16,2	7-8	2,5	17-18	1,1	10-13	15,7	9	17,0	20	8,6	23	192-200	22

** – the cell's bold boundaries highlighted the best integral values of the region's indicators, and shading is the worst;*
*** – calculated as the sum of the values of ratings for each indicator*

Table 6.4. Rating of Ukrainian regions by the level of transport, transit and personnel potentials

Regions of Ukraine	transport	transit	personnel	General ranking*	Integral ranking
Vinnytska	7-8	6	17	30-31	9-10
Volynska	18-19	20	16	54-55	18-19
Dnipropetrovska	1	3-4	3	7-8	2
Donetska	3	2	7	12	5
Zhytomyrska	11	13	20	44	12
Zakarpatska	24	23	13	60	21
Zaporizka	7-8	9	8	24-25	7
Ivano-Frankivska	25	22	12	59	20
Kyiv	5	1	1	7	1
Kyivska	13-14	8	6	27-28	8
Kirovohradska	18-19	17	25	60-61	22-23
Luhanska	9	15	9	33	11
Lvivska	6	7	5	18	6
Mykolaivska	17	18	11	46	13
Odeska	4	3-4	2	9-10	3
Poltavska	10	10-11	10	30-31	9-10
Rivnenska	21	10-11	23	54-55	18-19

Table 6.4. Continuation

Regions of Ukraine	transport	transit	personnel	General ranking*	Integral ranking
Sumska	16	14	19	49	14
Ternopilska	22	21	18	61	24-25
Kharkivska	2	5	4	11	4
Khersonska	20	16	15	51	15-16
Khmelnytska	12	19	21	52	17
Cherkaska	15	12	24	51	15-16
Chernivetska	23	24	14	61	24-25
Chernihivska	13-14	25	22	60-61	22-23

**- calculated as the sum of rankings for each indicator.*

According to the results of the research, we see that the city of Kyiv, Dnipropetrovsk and Odesa regions have the highest level of transport, transit and personnel potentials (highlighted in the bold cell borders in table 4), which in our opinion will contribute to more effective planning, organization, regulation and control of product delivery and services provided by manufacturers to consumers in these regions, the formation and implementation of economically feasible marketing logistics measures for enterprises that shape or extend the distribution system and, in the end, will help manufacturers of innovative or existing products to establish long-term, mutually beneficial and reliable connections in the distribution channels. These findings are in accord with those from other countries [34, 35]. Unfortunately, Ternopil, Chernivtsi and Chernihiv regions (highlighted by shading in table 4) have the lowest level of transport, transit and personnel potentials that needs to be increased, for example, due to the development of the personnel potential in Ternopil and Chernivtsi regions, because they occupy 18 and 14 positions respectively in the ranking or growth the transport potential in Chernihiv region, because it takes 13-14 positions.

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6.2. Criterion basis of marketing channels suitability for innovative products distribution[4]

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Today the role of marketing channels in the world economy and specifically for manufactures and costumers increases. Scientist S. I. Kiriukov says that only efficiently build and managed marketing channels system can deliver goods to the end users in the best way and convince that these products are the best comparing to analogous in the market. According this statement we summarize that the choice of marketing channels for product distribution must be diligent and careful. Such statement explains that right chosen marketing channels, other words, optimal marketing channels increase innovation product chances to be successful on the consumer market. It also contributes to delivering even insufficiently effective innovative products to the target market. Opposite situation also possible in case when wrong marketing channels are chosen for innovation product distribution, in such case perspective innovation can be failure.

The choice of the marketing channels in the formation of the distribution system depends on the scope of its activities, the markets, the specifics of the produced products, the management strategy, and the level of innovation activity. The process of marketing channels choice for innovation product distribution at the enterprises which are engaged in innovative development becomes especially important.

Recently, one of the most discussed issues between scientists in economy field stay issues concerning the products distribution and their effective delivering to consumers. Channel researches offer numbers approaches and strategies to «build» an effective and efficient marketing channels for product delivering to the end users. In just the past decade, the number of publications focused on marketing channels has grown by more than 150%. So, the issues that reveal the essence, significance and structure of distribution policy are disclosed in the publications of such academics as Bilovodska O.A. [1], Pavlenko A.F. [12], Petrunia Yu.Ye. [13], Prymak T.O. [14] etc. Accordingly, there are numbers of academics who provide analysis of the role and structure of marketing distribution policy. The issues of distribution marketing channels management have

[4] The publication contains the results of studies conducted by President's of Ukraine grant for competitive projects F70 of the State Fund for Fundamental Research ("Formation of the management mechanism of products' distribution at the industrial enterprises on the innovative basis", № SR 0117U001682)

been reflected in the scientific works of such individuals as Hladun P.P. [3], Horčels L., Marijen E., Uest Č. [4, 5], Krykavskyi Ye.V. [9], Naumov V. M. [11], Skliar O. M. [17], El′-Ansari A.I., Koflan E.T., Štern L.V. [18]. Theories related to the marketing channels choice are presented in the publications of such scholars as Gercyk V.A. [2], Duplenko N.G., Kharichkova Ye.V. [6], Korolchuk O.P., Syvanenko G.P., Toropkov V.M. [8], Lugunova D.O., Kotova M.V. [10], Samorodov V.B., Tiutiunnykova I.A. [15].

Based on analyze of extant marketing channel literature we provide a visual representation of the algorithm of marketing channels choice for innovation product. Summarizing the foregoing, we have developed a block diagram of the algorithm of marketing channels choice for the innovative products distribution, which has this form (Figure 6.26).

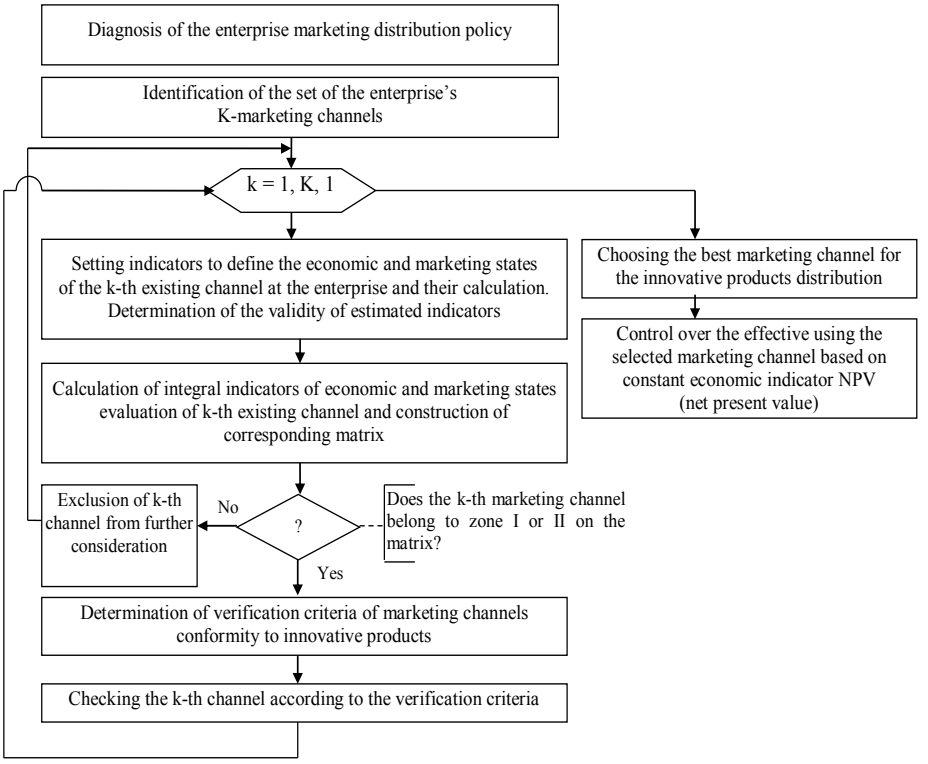

Figure 6.26. Block diagram of the algorithm of marketing channels choice for the innovative products distribution

So, we identify that the choice of marketing channels for the innovative products distribution at an industrial enterprise consists of 4 steps [16]:

1) diagnostics of the actual conditions of the marketing distribution policy at the enterprise;

2) evaluation of existing marketing channels of the enterprise;

3) checking existing marketing channels conformity to innovative products according to criterion base, and their final choice;

4) monitoring and control over the effective use chosen marketing channels through the time.

Each of these steps is basement for further steps, all steps are connected. Thus, the evaluation of existing marketing channels of an enterprise allows not only to determine their state (according to the results of the enterprise marketing channels evaluation they may occupy one of the positions: leader, challenger, follower, collector, eliminator [16]), but also to find out feasibility of their hold and use at the enterprise in subsequent periods. Also, such evaluation has another goal – identifying among the existing marketing channels, those that are the most appropriate for the distribution of innovative products. Other words, this evaluation helps to choose appropriate marketing channels for distribution of the proposed innovation. Important to check all marketing channels and complains with the specifics of innovative products.

So, it is important to develop an approach to marketing channels checking on their conformity to the innovative products specifics of the enterprise and to determine suitability of the channels to innovative products distribution.

A generalized block diagram of the algorithm for channels checking, based on the pre-made evaluation of channels conformity to the specificity of innovative products, is given in Figure 6.27. According to the block diagram, it is important to compare product characteristics with the conditions provided by the channels according to the group of criteria: 1) conformity of the products novelty level to the complex characteristics of the marketing channel; 2) the target market for innovative products and the market on which the channel operates; 3) conformity of innovative product to assortment distributed through the channel; 4) actions to promote innovative products; 5) readiness of channel participants for the innovative products distribution; 6) the risk of innovative products distribution through the marketing channel.

The transition between blocks of the algorithm is carried out using the «yes» and «no» queries. Specialists of the analyzed company who are engaged in the innovative products development, specialists in sales and

marketing, and direct participants in the channels must be involved in the checking process.

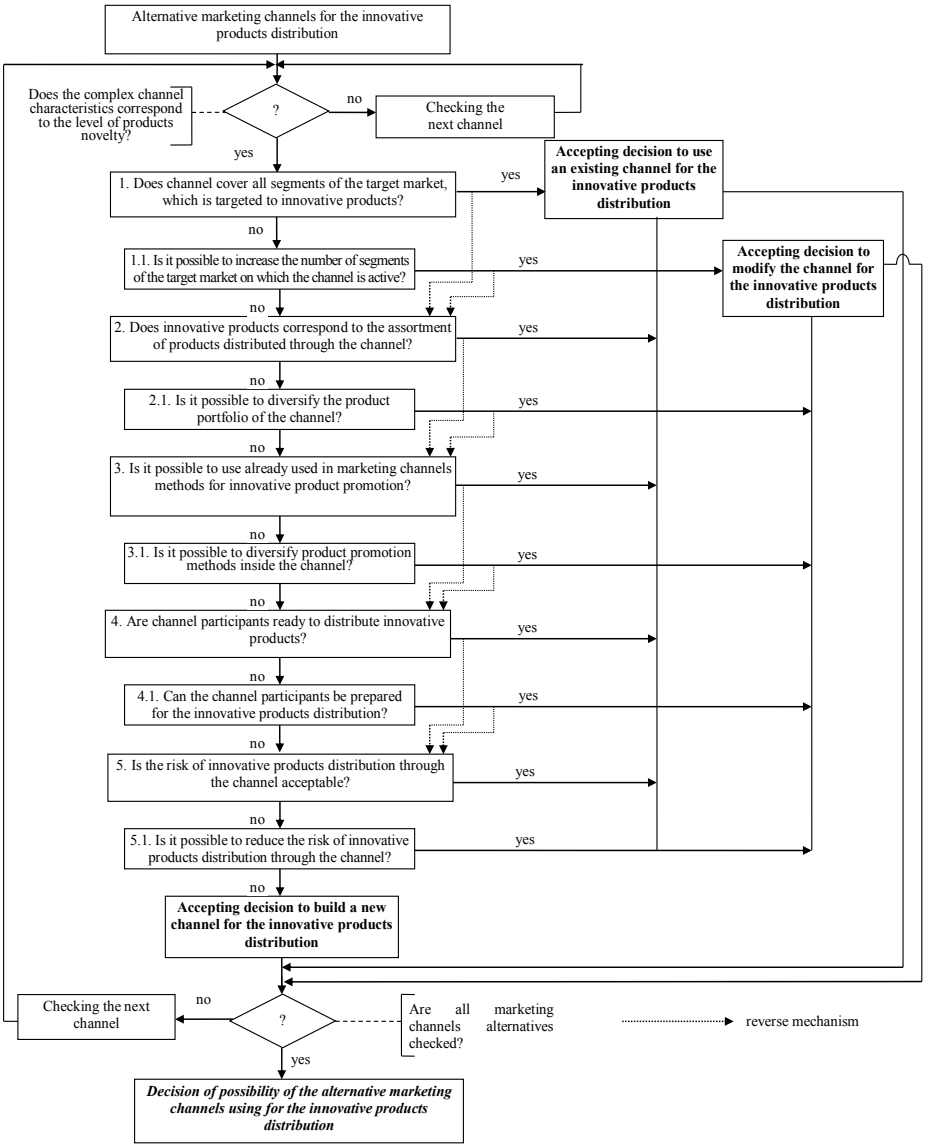

Figure 6.27. Block diagram of the algorithm for checking marketing channels conformity to the specificity of innovative products

Before accepting any decision connected with production and distribution of innovative products, verification of marketing channels according to the specified criteria must always be done. The fulfillment of all verification criteria (Fig. 6.27) indicates the high suitability of existing marketing channels for the innovations distribution and determines the possibility of their use without changes and, accordingly, requires least costs and efforts. Middle suitability is possible in case of channels discrepancy to individual verification criteria but with opportunity to improve them. Lack of such capabilities indicates a low suitability and determines needs of channels modification and/or their replacing with new specially designed channels.

Choice of appropriate marketing channels for the distribution of innovative products is determined, first of all, by the type of innovative products (radical, ordinary, improving – modifying and replacing). Options for selecting best type of marketing channel depending on the level of product innovation is shown in Figure 6.28. Diameter size of the circle depends on the acceptability of using marketing channel: larger circle means more appropriate type of marketing channel.

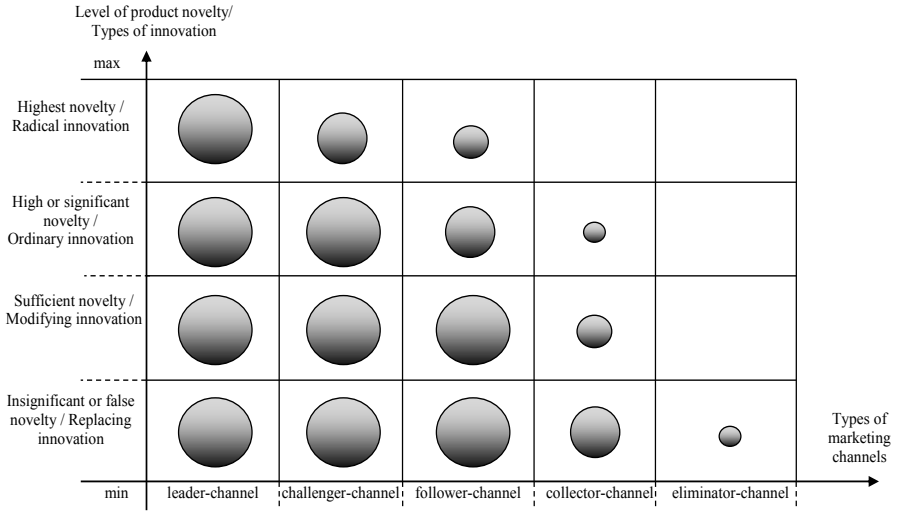

Figure 6.28. Intensity of marketing channels use depending on the level of products novelty

Types of marketing channels that can operate at an enterprise, and innovations (in terms of novelty) that are expediently distributed through the appropriate types of marketing channels are presented in Table. 6.5.

Table 6.5. Characteristics of marketing channels

Channel type	Characteristics of marketing channel	The level of innovation novelty
Leader	*Leading (dominant) position.* A significant part of the enterprise's production is distributed through the channel. «Leader» is profitable. Marketing activities at are at a high level. It is possible to distribute products with a different level of novelty through the channel. At the same time, such channel requires additional financial investments for maintaining achieved positions	*Radical,* ordinary, improving (modifying, replacing) innovations
Challenger	*Strong position.* Channel has a stable economic and marketing state. Such channel has a rapid pace of development. The channel can become a leader after additional investments in its development. Inclusion of innovation to portfolio of marketing channel products is considered as way to improve its functioning and achieve or advance the level of leader channel. «Challenger» can be used in the distribution of ordinary and improving innovations, and radical innovations can be distributed after its testing through leader-channels	*Ordinary and improving (modified, replaced) innovations*, also radical innovations after their testing through leaders-channels
Follower	*Favorable position.* Marketing and economic state of the channel indicates that the channel has a stable position. Channel's participants are not always ready to take risks arising from the inclusion of innovative products in the portfolio. To keep existing consumers and receive stable profits is the most important task for channel participants. It is expedient to use «Followers» for distribution of improving innovations, also for distribution of radical and ordinary innovations after their testing through leader-channels and based on their strategies. Using of leader-channels' strategies reduce the risk of failure and help to avoid losses	*Improving innovations,* also radical and ordinary innovations after their testing through leaders-channels
Collector	*Satisfactory position.* Channel has a low economic and mediocre marketing state, or mediocre economic and low marketing state. «Collector» can operate on a small segment of the market with well-defined consumer needs. Collector-channels get profit in the short term. After «harvesting» collector-channels must be eliminated gradually. However, such channels have the potential for development in the presence of favorable conditions. It is advisable to use collector-channels for traditional products distribution. In some cases, it is possible to use such channel for innovative products distribution, chiefly stare, to improving innovation	*Replaced innovations*
Eliminator	*Unsatisfactory position.* Channel's economic and marketing state is low. The channel does not develop and does not have any capacity to improve its status. «Eliminator» needs to be eliminated or radical reorganized. Eliminator-channels can be used for traditional products distribution during «harvesting»	*Traditional products*

For innovative products distribution, first of all, channels that are ready to distribute such products without changes are chosen. In case of

existing only alternatives that require channels modification or they replacement for new ones, it is important to specify solutions for existing channels modifications and options for new channels developing.

Modification of existing marketing channels according to innovative products requirements or creation of new channels require additional financial investments. Such investments are related to the formation/increase of channels suitability for innovative products distribution. There is correlation between costs and benefits of channel modification. The higher costs are incurred on the formation of marketing channels suitability for innovative products distribution, the lower costs will be connected with innovative products move through channels and at the same time higher level of customer service will be guaranteed. However, it is important to find such an interrelation between the costs on the formation of marketing channels suitability for innovative products distribution and results incurred with channels use in which these costs are justified.

Interrelation between the costs and level of marketing channels suitability for innovative products distribution is presented in Figure 6.29. According to it there is a certain level of marketing channels suitability, in which aggregate costs are minimal, and therefore, it is optimal.

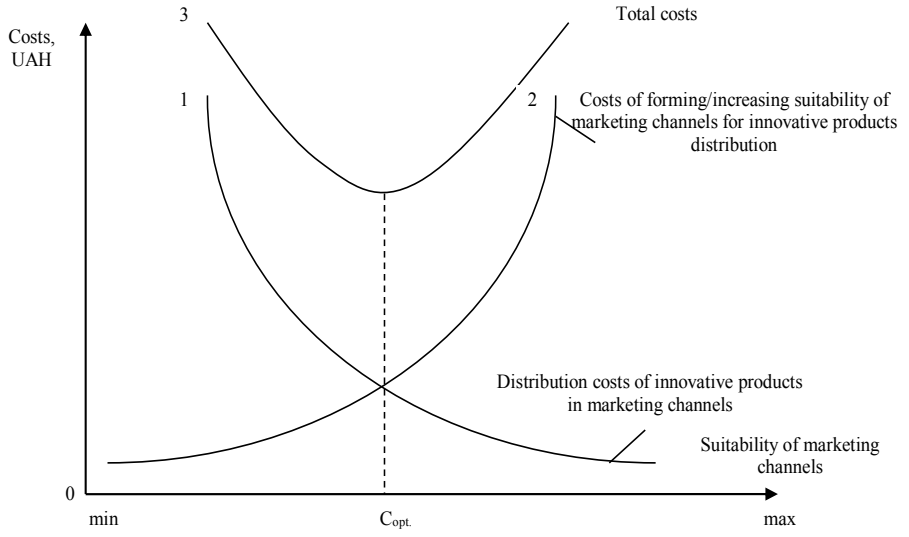

Figure 6.29. Interrelation between the costs and level of marketing channels suitability for innovative products distribution

Necessary, periodically, to do some additional costs in the process of forming/increasing marketing channels suitability for innovative products distribution. The volume of these costs has an inverse character to the level of channel's suitability: high level of suitability fitness fewer costs (Figure 6.29). Curve 1 in Figure 6.29 has the form of hyperbole and approaches the axis of absis. The reason of such tendency explains that there is no ideal marketing channel and channels for innovative products distribution throughout their life cycle require costs to improve or at least maintain the current state.

In the case of transition to the «Decision to modify the marketing channel» block (Figure 6.27) for each criterion, according to which the marketing channel does not suit to innovative products, measures are determined. Implementation of measures allows to lead the channel in accordance with innovative products specificity, other words, to improve the suitability of the channel. An indicative list of additional costs for increasing channels suitability for innovative products distribution by channels modifying, and results from their use is given in Table 6.6.

Table 6.6. Indicative list of costs and outcomes benefits connected with marketing channels suitability improving through their modification

Criterion requiring modification	Decision	Costs	Result
Market of innovative products	expanding marketing channel scope within the target market by targeting new segments; finding and attracting consumers of new products	costs for analysis of the market segment, where it is planned to distribute products; expenses for new partners searching and conducting negotiations with them; costs for preparing consumers to new products; expenses for maintenance of several segments in the target market	expanding scope of the marketing channel; raising of consumers awareness about innovative products and enterprises; increasing of consumers; increasing of orders number; consumer loyalty increasing
Correspondence of innovative product to the channel's assortment	defining place of innovative product in the existing products' assortment; innovative product embedding in the existing assortment	costs for analysis of enterprise products' assortment; costs on diversification of products assortment (extension, deepening or harmonization of assortment); maintenance and assortment management costs	assortment diversification and, accordingly, strengthening marketing channel position on the market; increasing of consumers

Table 6.6. Continuation

Criterion requiring modification	Decision	Costs	Result
Methods of innovative product promotion	new measures selection for innovative products promotion; adaptation of existing measures to new product specifics	marketing costs; cost of new communication promotions	raising consumers awareness about a new product and its manufacturer; increasing of consumers; increasing of orders and re-purchases number
Readiness of channel's participants for innovative products distribution	participants preparation to innovative products distribution	costs for channel participants valuation, and researching of their activities' effectiveness; expenses for participants training; costs for channel participants training according to innovative products distribution; costs for service improving within the channel	reduction of expenses for partners and consumers searching in the market of new goods; improving the quality of customer service
Risk of innovative product distribution	risk's reduction, prevention, liquidation, diversification, risk insurance	expenses for risk situations overcome and/or conditions creation for risks prevention	reducing of product distribution risk; reduction of losses due to risk situations; increasing of consumer confidence

Transition to the «Decision to build a new channel» block (Figure 6.27) means that the use of existing marketing channels or their modification will not provide sufficient suitability for innovative products distribution, therefore the development of new ones is the most desirable.

First, there is the question of choosing the type of a new channel – direct or indirect, such choice depends on industry, conditions of innovative products usie etc. An indicative list of costs and results connected with development of new channels for innovative products distribution is presented in Table. 6.7.

Table 6.7. Indicative list of costs and outcomes results connected with new marketing channels development

Channel type	Terms of use	Costs	Result
Direct channel	Highly specialized innovation requires high-quality service. Sufficient capacity of the manufacturer (experience in innovation distribution field, availability of necessary infrastructure, sufficient resources, etc.)	– costs for researching of conditions where new channel operates; – costs for developing and evaluating alternative channel options	– direct target consumers achievement; – increasing consumers number; – strengthening of the enterprise marketing channels portfolio; – diversification of the enterprise' channels activities; – increasing effectiveness of product distribution
Indirect channel	It is possible to involve participants who have experience in innovative products distribution and familiar with the target market. Moderate costs of attracting and retaining marketing channels members	– costs for researching of conditions where new channel operates; – costs for developing and evaluating alternative channel options; – costs for evaluating potential participants and their involvement in the channel	

Each version of the marketing channel modification or development of a new one is connected with a certain level of results (R) and costs (C). Considering that the financial capabilities of the enterprise are limited, simultaneous modification and/or development of new marketing channels at the enterprise is not always appropriate. Therefore, it is necessary to choose a variant of existing marketing channels modification or a new channels development from the whole set of alternatives. Costs for improving/forming existing channels' suitability or new channels' developing must be the lowest, and results – the best:

$$E_{MC} = \frac{R}{C} \rightarrow max, \tag{6.1}$$

where E_{MC} – coefficient of effectiveness of existing marketing channels' modification or development of new marketing channels; R – results from existing marketing channels' modification or new marketing channels' developing, money units; C – costs for existing marketing channels' modification or new marketing channels' developing, money units.

Additional profit is an overall result of modified channels or newly developed channels use. Additional profit is defined as the difference between profit received in the marketing channel after innovative products distribution and profit received before.

Costs for modification include:

$$C_M = \sum_{i=1}^{n} C_i = C_{TM} + C_{As} + C_{Pr} + C_P + C_R, \qquad (6.2)$$

where C_{TM} – potential costs for marketing channel withdrawal to another segment of the target market according to products specifics, money units; C_{As} – potential costs for innovative products inclusion in the existing products' assortment, money units; C_{Pr} – potential costs for additional marketing methods of innovative product promotion within the marketing channel, money units; C_P – potential costs for channel participants additional preparation to new products distribution, money units; C_R – potential expenses for reduction of risks of innovative product distribution, money units.

Costs of a new marketing channel development include:

$$C_N = \sum_{j=1}^{m} C_j = C_{MR} + C_A + C_E + C_{PC}, \qquad (6.3)$$

where C_{MR} – potential cost for marketing research for determination conditions of the marketing channel functioning, money units; C_A – potential costs for identifying alternatives of a new channel development, money units; C_E – potential costs for marketing channel's alternatives evaluation and choice of the best one, money units; C_{PC} – potential expenses for new channel's participants searching, money units.

Apparently, maximum effectiveness will be in case if formula denominator that represents costs amount for existing marketing channel modification or new marketing channel development (C), seeks to minimum, and the results of modified or new channel use, located in the numerator of the formula seeks to maximum. Effective will be those variants of marketing channels where effectiveness exceeds 1 ($E_{MC} > 1$).

Consequently, based on the passage of the steps of the algorithm, given in Figure 6.26, the enterprise for innovative products distribution can

choose existing marketing channel without changes, existing marketing channel after its modification or a new specially designed channel.

Taking into consideration dynamics of the external environment changes, that can be caused by the competitors' activities, changes in consumer inquiries, there is the need of periodically audit of marketing channels involved in the innovative products distribution. For this purpose, a generally accepted criterion for determining the effectiveness of investments in innovative project – net present value (NPV) – can be applied.

While checking the marketing channels (modified channels, and new specially designed channels) it is necessary to consider the factor of marketing channels suitability for innovative products distribution. This factor can be considered by including in the cash flows' table costs for maintaining and forming of marketing channels suitability for innovative products distribution. Formulas for calculating of net present value with factor including are presented in Table 6.8.

Table 6.8. Effectiveness checking of selected marketing channels use

Channel	Formula	Legend
1. Existing marketing channel	$NPV_k = \sum_{t=0}^{T} \frac{CF_{kt}^{+}}{(1+r_t)^t} - CF_k^{-}$	CF_k^+ – the net cash flow generated by the distribution of innovative products through the k-th marketing channel in t-year, money units; CF_k^- – the project costs on the development and implementation of innovative products, distributed through the k-th marketing channel, money units; t – year of marketing channel use for innovative products distribution, $t = 1, \ldots T$; T – period of marketing channel use for innovative products distribution, years; r – annual discount rate
2. Modified marketing channel	$NPV_k = \sum_{t=0}^{T} \frac{CF_{kkt}^{+} - C_{TMkt} - C_{Askt} - C_{Prkt} - C_{Pkt} - C_{Rkt}}{(1+r_t)^t} - CF_k^{-}$	
3. New marketing channel	$NPV_k = \sum_{t=0}^{T} \frac{CF_{kkt}^{+} - C_{MRkt} - C_{Akt} - C_{Ekt} - C_{OPCkt}}{(1+r_t)^t} - CF_k^{-}$	

So, there is always a set of alternative marketing channel options that can be used for innovative products distribution [19, 20, 21]. It is important to choose such marketing channel that is the most relevant to the innovative products specifics, needs the lowest costs and at the same time brings the best results. Therefore, we propose a list of criteria based on possibility to determine the best marketing channel for innovative products distribution among existing ones. It is proposed to evaluate chosen marketing channels during their use for innovative products distribution. Also evaluation based on the calculation of net present value allows to make a decision for appropriate changes or channel replacing with new one.

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6.3. An analysis of logistic service particularities and outsourcer's impact on it's quality on industrial market[5]

Gaidabrus N.V., Ruban D.A., Zielińska A.

The modern economy is characterized by permanent changes in the state of external micro and macro environment, acceleration of the pace of technological progress (PTP); reduction in product life cycle; increasing the competition between domestic and foreign producers; changes in consumer tastes and preferences. World experience shows that such conditions are for competitive enterprises, which provide higher level of service in delivering products. But the quality of logistics services in the distribution system lets enterprises increase the chances of successful long-term development of the market, enhance their own image as a reliable partner and thereby consolidate and develop competitive position.

At the same time there is a tendency to be concentrated on the main types of activities of enterprises and more and more often the question of transferring the certain functions to outsourcing arises. Analyzing the market of outsourcing it can be said that it is rapidly developing in the world and in Ukraine. There is a growing number of companies that provide outsourcing services and the number of companies that attract outsourcers. [2]

Logistics processes and logistics service in particular is not an exception. But at the same time there is always an open question: how will the quality of the logistics service change during outsourcing logistics transmission? From the other side the success of the manufacturer in the market also depends on correct understanding of the role of logistics and logistics services at each of these stages and, accordingly, the chosen strategy.

There are many studies that help to get closer to the answer on this question, but they are very individual for different countries and different types of activities. For example, Hrušecká Denisa, Macurová Lucie Juřičková Eva Kozáková Leona [14] conducted a study of Czech Manufacturing Companies, and determined that the statistical testing showed just an average dependence between the areas of logistics outsourcing and the main reasons for outsourcing logistic activities. Therefore, it is not possible to say strictly that some logistic activities should be outsourced and the other ones not. It depends on many other factors.

[5] The paper was written according to budget money from the Ministry of Education and Science in Ukraine, given to develop research topics № SR 0117U003928 «The mechanism of management of the formation of strategies of outstripping innovative development of industrial enterprises»

But it remains unclear which set of indicators should be used and how the quality of the logistics service will change. Mariusz Szuster suggests in his work that in many cases manufacturers purchased transport services only and did not consider outsourcing a wider range of logistical functions [15]. That is why he considers this question from the side of transport logistics.

These studies are not the only ones and they do not give a full answer to the main question. So, we propose our own version of revealing the level of impact of logistics outsourcing on the quality of logistics services using the example of SUMY ENGINEERING WORKS Ltd.

Planning the development of the supply chain is very important. An enterprise must meet the needs of the product strategically and ensure the integration of all its elements. Regardless of the industry or technology of production, the form of organization of the enterprise, etc., the logistics service is characterized by the peculiarities of the various stages of the existence of the product. Its tasks are not static - they vary depending on the urgent requirements of the period of existence of the goods.

Speaking about the peculiarities of the logistic service for the goods of industrial enterprises, we have defined their characteristics that influence the process of transportation, transfer and delivery (Fig. 6.30), which are determined by the main tasks of each stage of the product life cycle.

This is primarily due to the fact that logistics at each stage plays a different role and is influenced by various factors of external and internal circumstances.

1. Product launching. At this stage, the main requirement for logistics is an auxiliary role in the process of consolidation in the market. This is explained by the fact that in the first stages all business processes are not yet practically tested.

This situation results in the fact that a number of factors, such as human error, outdated data for calculating the analyzed indicators taken into account in planning, etc., may even negatively affect the planned result, even due to a slight margin of error. Consequently, the main challenge and challenge facing logistics is the flexibility and adaptability in unforeseen situations.

It has been investigated that the innovation of goods, as a rule, creates additional risks in the implementation of logistics operations. Speaking about such risks, one should note the following: Innovative goods are not known to carriers of logistics practices. That is, in the presence of general rules of transportation, loading and packaging, there is no experience of the carriers themselves for a particular type of goods.

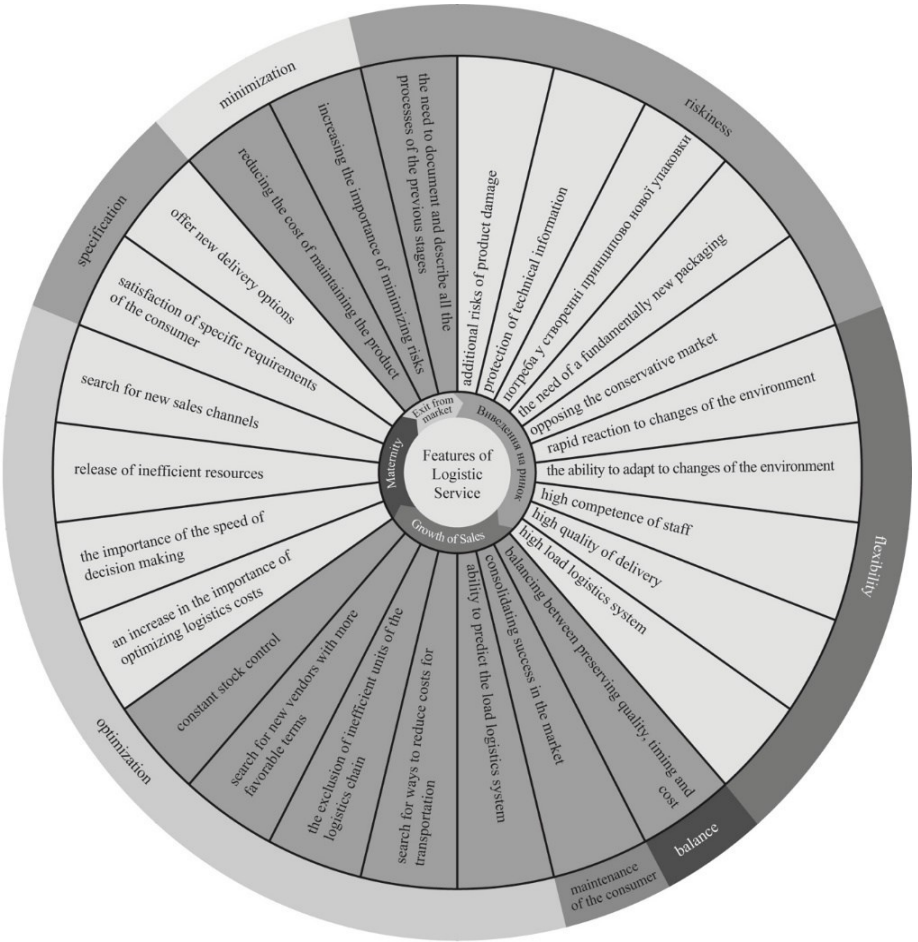

Figure 6.30. Features of logistic service during the life cycle of an industrial product

This creates additional risks of damaging the product or reducing its qualitative characteristics. The reason is lack of understanding of the peculiarities of the transportation of this innovative product. Typically, such a practice is formed over a period of time.

In the modern world, technical information (for example: patents, know-how, etc.) is one of the most important assets of companies engaged in innovation activity, and therefore requires additional levels of protection not only at the stage of production, but also when moving innovation, the goods to the final consumer.

It has also been established that innovation involves not only the introduction of a number of innovations into production, but sometimes also the creation of a fundamentally new packaging and the use of new transportation methods. This is explained by the fact that innovative products may have certain specific features (form, size, weight, rules of transportation and packaging, storage in warehouses, temperature regime, etc.), which creates additional complications when moving the final product from the manufacturer to the consumer.

Consequently, the logistics service of innovative goods of industrial enterprises may not always be able to sustain a level of supply that could satisfy the existing demand. One of the reasons is a number of additional requirements, which must be met by carriers for the direct delivery of the goods, while preserving all its useful properties.

So, summing up the role of logistics at the entry stage, we can say the following - logistics service is the basis that is not as noticeable as other components of the marketing mix, but without which the product has no chance of success.

2. Growth of sales. This stage is characterized by stability, compared with the stage of entering the product on the market. This can be explained mainly by the fact that the logistics system has already passed the test, and if the production and sale of the goods were not terminated due to fatal errors of the first stage, then during the growth stage, as a rule, the already tested system of decision-making, including and the stability of the logistics service.

This stage can be called the stage of securing success. If the first stage is primarily characterized by the need for prompt response and correction of planning errors, then in the second stage accents are shifted from solving operational tasks under any conditions to balancing between preserving the quality, timing and costs that ensure the operation of the logistics service at the enterprise.

This stage is transitional - from sharp jumps to a stable growth in order to achieve the goals of break-even sales and increase the presence in the market in the chosen field.

At the present stage, a system has already been formed, unreliable suppliers and carriers have been rejected, practical advice has been gained through practical experience with the logistics process methodology, the original plan has been corrected and tested, and the growth rate of demand is not already unknown and can be predicted on the basis of obtained statistical data.

The main objective of logistics at this stage is to optimize processes - reduce transportation costs, review the list of partners with the exclusion

of inefficient units of the logistics chain, search for and sign contracts with new suppliers, helping to reduce the accompanying costs, etc.

The goal of the logistics service is changing – tasks connected with the rapid entry into the market are gradually replaced by consolidation of results and increase in sales volumes. At this stage, logistics should be transformed into a tool for optimizing costs and increasing profits.

Consequently, after the rapid development phase, which requires significant organizational and financial costs, the logistics service has been transformed from an application tool for adaptation to a source of analytical data on sales levels, as well as a basis for optimizing costs when delivering goods to the market.

Despite the comparable stability of this phase, the main task is to control stocks and to quickly adjust the supply and demand levers by filling the market with goods.

3. The stage of maturity. Characterized by the aggravation of competition, and therefore from the usual tool for filling the market goods, logistics service is transformed into a means to meet specific customer requirements.

At this stage, the qualitative characteristics of the goods have been successfully brought to the attention of buyers and to consolidate the positions there are requirements for the provision of additional services.

On the one hand, the goal is to strengthen consumer loyalty and to continue to create a positive image, and on the other – to create an additional value of goods by offering new options, expedited delivery time, new packaging of goods, etc.

At the stage of maturity, the necessity of optimizing the costs of logistic support for production and sales is becoming even more important as it is a component of the price of the product, and in a competitive struggle, cost optimization leads, on the one hand, to an increase in profits, which, in turn, can be used for modernization production, investment in the scientific and technological process, on the other hand - to reduce the price, which can create an additional competitive advantage in the market.

This stage is characterized by stability at a rate of growth and does not require extreme efficiency in decision-making. More important are the analytical components of the logistics service, which are dominated by the following analysis of available indicators: the ineffective elements and how to optimize them, the timing of each phase of the logistics service, the unnecessary elements and the main directions of reorganization to release resources that can be redirected to improve business processes.

At the same time, the search for new sales channels, which is characterized by a larger volume, with a lower cost, continues. The attraction of new channels is the cause of the complication of organizational processes and, consequently, the creation of a multi-level logistics process management system.

This stage should also be prepared for the next stage of the exit from the market. A manufacturer who organizes a logistics service that ensures its activity must timely identify the situation of lowering demand and redirect resources, both production and transport, and accompanying marketing support for a new or more successful product, which will minimize losses from inefficient cost of resources.

4. The stage of exit from the market. The Dani stage is primarily due to the active sale of the remainder of the goods, as well as the gradual suspension of the goods. Logistics at this stage plays the role of a risk minimization tool and helps to reduce the cost of maintaining the product, and also preserves the potential profit from unsold goods, which will need to be stored and disposed of, which in turn will lead to additional costs.

On the other hand, the reduction of entrepreneurial activity should not be considered final and final, the more correct term will be the temporary suspension or canning, rather than the complete withdrawal from the market.

This can be explained by the fact that at each moment of time it is necessary to be ready to return to the market. This may be due to the renewal of interest in the product, the emergence of a new investor or a major customer who is interested in this product.

This means that one of the main tasks at the exit of the product from the market is the documentation and thorough description of all processes at the stages passed before the release of the product on the market for the purpose of operational renewal and re-deployment of production provided that this is required by the market.

Summarizing the above, we can note that at all stages the logistics service plays different roles, but always in the main positions and ensures stable operation of the enterprise, process of optimization of expenses, attraction of new distributors and consumers, and also allows to minimize expenses at the stage of withdrawal of the goods from the market. It is determined that one of the opportunities for increasing the level of logistics service is to study the relevance of its features for innovative and traditional industrial goods.

The valuation of logistics services in the supply chain industry was spent in researching by using four groups of indicators discussed in details in previous works [3, 4], the quality and the execution time,

flexibility of service and information provision. Each of these groups contains elements of logistics services which are selected depending on the specifics of the company.

The above mentioned elements are proposed to be estimated using quantitative and qualitative indicators. Data for calculation of quantitative indicators are contained in the internal statements, which include a specially shaped figures and general statistics that can be used to carry out an objective assessment of logistics services.

We mean the complex of services as logistics service supply chain. It accompanies marketing, commercial, logistics and sales activities in moving products to the final consumer in accordance with the strategy of the entity most appropriate in terms of cost manner.

The overall rating of indicators of the enterprise, analytics counterparties about the terms for the prices of logistics services, market research is related to the common documents containing information on the effectiveness of logistics services.

The conclusions of experts in logistics and specialists of the analyzed company which were involved to analyze logistics services in the enterprise can be a source of quality indicators.

It is important to consider that only customers can evaluate the service level objectively, so you must maintain contacts with them using all possible channels.

These channels include a direct survey by questionnaire, targeted phone calls, other methods of receiving complaints and suggestions, and by gathering information through analysis of dynamics of economic activity.

Besides the validity of indicators, experts determine the gain and reducing the action of each of the indicators, that is caused by synergy effect which will be discussed below.

The weighted average value of indicators in different conditions of delivery, i.e. for each performance evaluation, is the only logistics service index (Ei) as follows:

$$E_i = \frac{E_{o.f.i} * N_{o.f.i}}{N} + \frac{E_{l.o.i} * N_{l.o.i}}{N}, \tag{6.4}$$

where $No.f.i$ – the number of orders in the accounting period is brought by own forces of producer; $Nl.o.i$ – the number of orders in the accounting period delivered by logistics operator; $Eo.f.i$ – the total values of the indicator of logistic service in conditions of delivery by its own forces; $El.o.i$ – the total values of the logistic service in conditions of

delivery by logistics operator; N – the total number of ordered products within the accounting period, units.

The total value of indicators in conditions of delivery of its own products (*Eo.f.*) and logistics operator (*El.o.*) is calculated as the product of corresponding component and its importance:

$$E_{o.f.} = \sum_{i=1}^{n} E_{o.f.i} * W_{o.f.i}, \quad (6.5)$$

$$E_{l.o.} = \sum_{i=1}^{n} E_{l.o.i} * W_{l.o.i}, \quad (6.6)$$

where *Wo.f.i* and *Wl.o.i* – the weight of *i*-element of the logistics service at delivery by its own forces of producer and logistics operator respectively.

The idea of a synergistic effect is a foundation for the basis of calculation of integral index of logistics services. Synergy is an advantage which cannot be repeated by any competitor. Correctly used the benefits of synergy can increase economic enterprise profit in the supply chain. It is expressed in a complex impact on all items of service to the general impression of user and differs from simply adding the values of each element separately (adapted from [12]):

$$S_{\text{в.}} = f(E_1, \dots, E_n) \quad (6.7)$$

where S_e – the effect from the impact of elements of logistics services; f (E_1,..., E_n) – applying the effects of the influents the elements to logistics services; E_1,..., E_n – the elements of logistics services.

However, a synergistic effect may have a directly opposite results [1]:

- be negative (f (E_1, ..., E_n) < E, where E – the total effect) in case of weakening (neutralize) the impact of various factors;
- be positive (f (E_1, ..., E_n) > E) if they gain swashbuckling action depending on the combination of elements for strengthening the impact of various factors.

A result of analysis of works by Hadzhynsky A. [2] Krykavsky E. [8] Mykolaichuk V., Kuznetsov V. [11] shows an exponential dependence service costs and, consequently, the level of customer satisfaction and logistics services provided by the enterprise, from about 70%. It means that interaction between two or more components of the logistics service

gives a result greater than what could be obtained under the conditions of impact of each of these factors separately.

On the basis of proposed approaches and division of the scale at intervals [6, 9, 13]: 0-0,33; 0,34-0,66; 0,67-1, a graph of the level of satisfaction of the execution order from LS enterprises was constructed where the point of intersection with the axis of logistics services is 67% (Fig. 6.31). Built schedule looks like cubic parabola with equation $y = (x - 67)^3$.

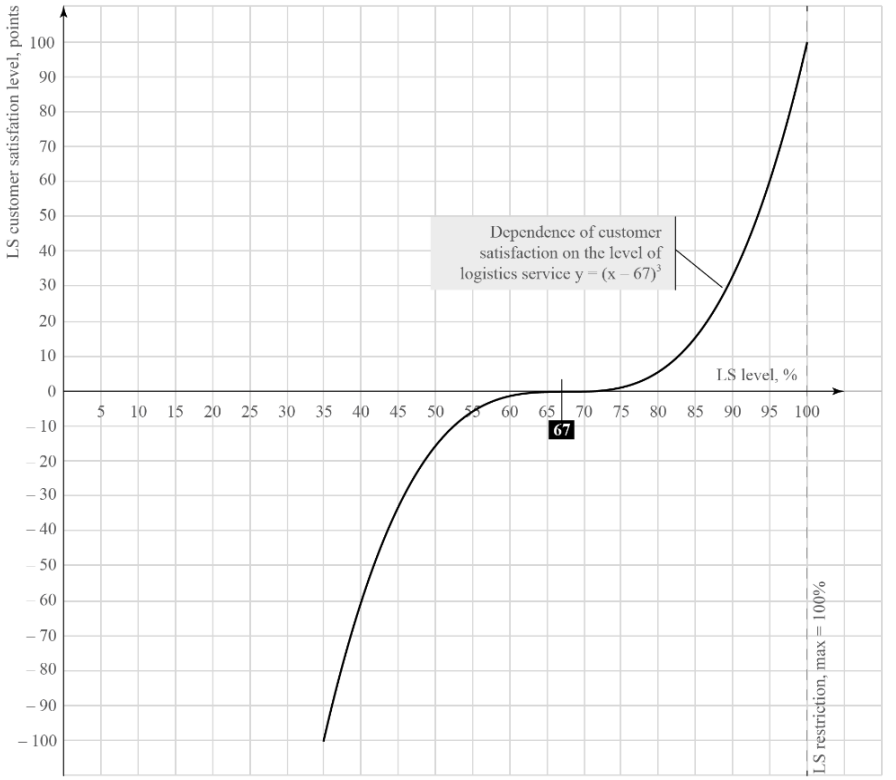

Figure 6.31. The dependence of the level of consumer to satisfaction execution of orders from logistics services company

Thus, the integral index is the sum of the partial integrated assessment of logistics services, the level of customer satisfaction elements of which is less than 67% (not inclusive) and partially integrated assessment of logistics services, the level of customer satisfaction elements of which is from 67% to 100% (Fig. 6.32).

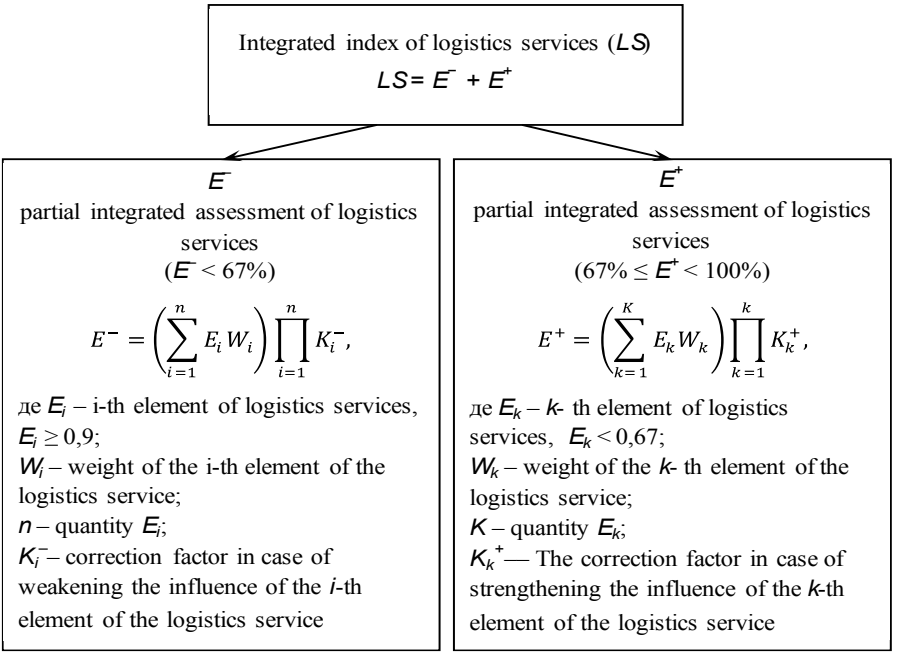

Figure 6.32. Calculation of the integral parameter of logistic service company

To analyze the degree of control of the manufacturer above the logistics service we offer to use the elasticity of logistic service on the volume of supplies to measure the degree of impact of changes in scope of supply, which is controlled by the manufacturer for the given level of logistics services. The given indicator is calculated as follows:

$$E_V^{LS} = \frac{\sum_{i=1}^{n} \frac{\Delta LS_i}{\Delta V_i}}{n-1}, \tag{6.8}$$

where E_V^{LS} – the elasticity of individual indicators of logistic service from the volume of supply; ΔLS_i – changing the values of the of logistic service in comparison with previous year; ΔV_i – changing in volume of deliveries in comparison with previous year; n – number of years in the analyzing period.

If the index is more than 1, it can be concluded that the logistics service is flexible, that is small change in volume of deliveries carried out by the manufacturer causes significant changes in the quality of service

in the supply chain. And otherwise - if the index is from 0 to 1, the service is inelastic.

The inverse index is the degree of impact of an enterprise on logistics service:

$$E_V^{LS} = \frac{\sum_{i=1}^{n} \frac{\Delta V_i}{\Delta LS_i}}{n-1} \quad (6.9)$$

Thus, depending on the resulting value of this indicator, all elements of logistics services are offered to be divided into three groups based on their values: high (5%), medium (5 to 20%) and the lowest (20%) level of control. The indicators which were in the low control segment have the highest priority in terms of attention from the producer enterprise towards the support and implementation of appropriate measures. The indicators from the middle segment of control are the next. Thus, the elements of logistics services are different by high stability, they are located in the respective segment.

SUMY ENGINEERING WORKS Ltd is a private industrial-engineering enterprise. The main core is the development, design, manufacturing, testing and implementation of the pumping equipment. It is a high-tech certificated enterprise, which was working well at many facilities of countries near and far abroad during 10 years.

Indicators of logistic service are calculated separately for delivery of their own products and outsourcing of logistics services. The main results of the calculations are presented in Table 6.9.

The graph (Fig. 6.33) demonstrates that the company SUMY ENGINEERING WORKS Ltd has gradually reduced the volume of supply by their own forces since 2012 in favor of delivery outsourcer, which caused reduction of logistics services. It is confirmed by the calculated correlation coefficient (r) between the level of logistics services and the number of orders that were delivered by themselves (r = 0.9686) and the level of logistic service and the number of orders which were delivered by logistics operator (r = -0.9686). Values of the coefficients are close to 1, indicating a high strength link between analyzed indicators.

Table 6.9. Indexes of logistic service of SUMY ENGINEERING WORKS Ltd in 2012-2016 years

Index of LS		2012			2013			2014			2015			2016		
		value index for the conditions of delivery:		Total value of the index	value index for the conditions of delivery:		Total value of the index	value index for the conditions of delivery:		Total value of the index	value index for the conditions of delivery:		Total value of the index	value index for the conditions of delivery:		Total value of the index
		on their own	logistics provider		on their own	logistics provider		on their own	logistics provider		on their own	logistics provider		on their own	logistics provider	
Quality of the order	Accuracy in carrying out orders	0.98	0.86	0.92	0.96	0.86	0.91	0.96	0.84	0.90	0.99	0.86	0.93	0.95	0.93	0.93
	absence of damage during transportation	0.92	0.60	0.76	0.91	0.60	0.75	0.91	0.58	0.74	0.94	0.60	0.77	0.87	0.90	0.89
Time of the order	Average delivery time	0.96	0.80	0.88	0.95	0.80	0.88	0.95	0.78	0.86	0.97	0.80	0.88	0.91	0.95	0.94
	variability of delivery time	0.98	0.99	0.98	0.96	0.99	0.98	0.96	0.96	0.96	0.98	0.99	0.98	0.89	0.95	0.94
	Convenience of warehouse location	1.00	1.00	1.00	0.99	1.00	0.99	0.99	0.98	0.98	1.01	1.00	1.00	1.00	1.00	1.00
Flexible service	Maintenance unusual requests	0.86	0.39	0.63	0.85	0.39	0.62	0.88	0.36	0.62	0.87	0.39	0.63	0.47	0.18	0.24
	Availability of minimum volume of orders	1.00	1.00	1.00	0.99	1.00	0.99	1.01	0.98	1.00	1.01	1.00	1.00	1.00	1.00	1.00
	Availability of additional services	0.95	0.32	0.64	0.94	0.32	0.63	0.96	0.30	0.63	0.96	0.32	0.64	0.90	0.50	0.59
	Possibility of an accelerated delivery of goods	0.96	0.88	0.92	0.95	0.88	0.91	0.97	0.85	0.91	0.97	0.88	0.92	0.60	0.64	0.63
Information support	Availability of accurate and timely information about orders	0.78	0.33	0.55	0.77	0.33	0.55	0.79	0.30	0.55	0.80	0.33	0.56	0.83	0.19	0.32
	Addressing complaints or bug fixes	0.86	0.65	0.76	0.85	0.65	0.75	0.87	0.63	0.75	0288	0.65	0.77	0.90	0.45	0.55
	Effectiveness of communications	0.90	0.65	0.78	0.88	0.66	0.77	0.91	0.63	0.77	0.91	0.66	0.78	0.78	0.38	0.47
	Competence of staff	0.99	0.97	0.98	0.97	0.97	0.97	1.00	0.95	0.97	1.00	0.97	0.99	0.89	0.90	0.90
Integral value of the index		0.93	0.73	**0.93**	0.92	0.76	**0.88**	0.94	0.70	**0.79**	0.94	0.69	**0.77**	0.90	0.63	**0.68**

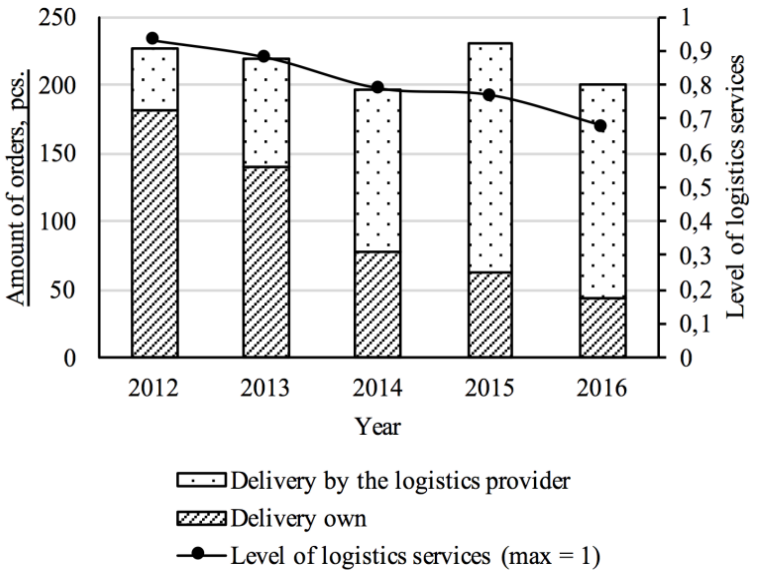

Figure 6.33. The volume of contracts of SUMY ENGINEERING WORKS Ltd in 2012-2016 years

So, according to the calculations, we can make a conclusion that in case of their own delivery, logistics service level is higher – 0.899 than in case of logistics outsourcing – 0.63. It may be related to the fact that in the first case at the company higher level of control over the process and the capacity for flexible and rapid response to various demands of consumers, which is very important for competitiveness.

According to the analysis of elasticity of indicators of logistics services depending on the volume of supply on their own (tab. 6.10), it defined the most sensitive components:

- the effectiveness of communication;
- the possibility of rapid delivery of goods;
- no damage during transportation;
- availability of reliable and timely information about demand;
- resolution of complaints and bug fixes.

Table 6.10. Indexes of logistic service of SUMY ENGINEERING WORKS Ltd in 2012-2016 years

Year		2012	2013	2014	2015	2016	Total flexibility of logistics services
The volume of deliveries performed by the manufacturer, %		80	64	39	27	21	
Flexibility index of logistics services (relative to the previous year)	Accuracy in carrying out orders	0.26	0.2	0.15	0.07	0.71	0.28
	Absence damage during transportation	0.4	0.54	0.44	0.57	3.63	1.12
	Average delivery time	0.36	0.23	0.2	0.01	1.72	0.50
	Variability of delivery time	0.09	0.07	0.04	0.23	0.9	0.27
	Convenience of warehouse location	0.07	0.04	0.04	0.15	0.05	0.07
	Maintenance unusual requests	0.3	0.51	0.49	1.63	0.74	0.73
	Availability of minimum order quantity	0.06	0.04	0.01	0.09	0.05	0.05
	Availability of additional services	0.77	0.67	0.64	0.54	1.67	0.86
	Possibility of an accelerated delivery of goods	0.21	0.12	0.11	0.06	4.9	1.08
	Availability of accurate and timely information about orders	0.58	0.49	0.48	0.29	2.33	0.83
	Addressing complaints and bug fixes	0.79	0.25	0.22	0.1	2.98	0.87
	Effectiveness of communications	0.78	0.39	0.25	0.1	4.71	1.25
	Competence of staff	0.3	0.17	0	0.07	1.44	0.40

The obtained data make it possible to determine the degree of impact on values of logistic service delivery under the different conditions. Considering that the company may have its fleet or use the services of logistics operators, change rates on which it can impact. By using index, you can see the percentage change in value of an individual parameter logistic service by changing the control entity 1% of supply. The low value of the index indicates a high degree of control over his company. And vice versa – the higher the rate – the less it is subject to control by the manufacturer.

So, we propose to allocate all of the elements of logistics services into three groups based on their values: high (5%), medium (5 to 20%) and the lowest (20%) level of control.

Table 6.11. Degree of impact of the enterprise on logistics service

Level control	Index logistic service	Degree of impact on individual indicators LS, %	The overall degree of impact on the level of logistics services, %
high	Availability of additional services	1.38	23.22
	Maintenance unusual requests	1.5	
	Availability of accurate and timely information about orders	2.01	
	Absence damage during transportation	3.21	
	Effectiveness of communications	4.4	
	Addressing complaints and bug fixes	4.81	
average	Accuracy in carrying out orders	7.02	
	Possibility of an accelerated delivery of goods	8.5	
	Variability of delivery time	10.75	
	Ease warehouse location	19.58	
low	Minimum order size	46.55	
	Average delivery time	51.52	
	Competence of staff	140.64	

So, tab. 6.11 illustrates that in the case of outsourcing of logistics services manufacturer completely loses its control over a group of indicators of competence of staff, the average delivery time and availability minimum order size, because there is a high impact on these figures enterprises outsourcer.

However, despite this the share control of the following parameters is high:

- the presence of extra services and service unusual requests – is largely dependent on the willingness of the manufacturer to offer and provide an additional package of services that can precede or accompany the delivery of the goods or satisfy specific needs of customers;
- availability of accurate and timely information on demand - due to the fact that the company-manufacturer has the opportunity to provide the ability to track the order status during delivery or in the process of solving problems;
- no damage during transportation is provided for producers to organize suitable type of packaging that reduces the amount of damage during transportation;
- effectiveness of communication and availability of information about orders depends on the capabilities of the logistics operator to perform data transfer to the producer in case of status updates product and its willingness to meet;

- resolving of complaints and bug fixes - producer is more interested in solving the conflict, as its share in this process is overwhelming.

Summarizing, it is worth saying that we have analyzed the values of logistic service in conditions of delivering by its own forces and outsourcers supply chain in dynamics by years and determined that in case of their own delivery, logistics service level is higher - 0.899 than in case of logistics outsourcing - 0.63. It may be related to the fact that in the first case at the SUMY ENGINEERING WORKS Ltd higher level of control over the process and the capacity for flexible and rapid response to various demands of consumers, which is very important for competitiveness.

It was determined how the value of each individual index varies with the change in the supply control volume. The low value of the index indicates a high degree of control over his company. And vice versa – the higher the rate – the less it is subject to control by the manufacturer.

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Section 7

Innovations in the regulation of economic and legal relations

7.1. International sanctions in the modern conditions

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Sanctions (from the Latin sanctio – the strictest regulation) [1, p. 716] – measures of influence on individuals, organizations or states directed against deviations from those or other norms are manifested in the approval of certain interested parties and are called to force a violator to carry out the states', organizations', and persons' will who have imposed sanctions. Otherwise, these are unilateral or collective actions against a country considered to be a violation of international law aimed to compel that state to comply with the law. Sanctions are something between a diplomatic actions and more intense measures that can include military actions and hidden operations, help to end diplomatic relations, boycott sporting and cultural events, sequestration (from Latin sequestro – to separate) [1, 722] property of a foreign state and its citizens. However, restrictions of international trade, financial transactions and people movements are the most common sanctions forms [2].

There are military, financial, economic sanctions. Thus, Germany and Japan, being defeated in the World War II, do not have the right to have full-fledged armies, the former Prime Minister of Ukraine P. Lazorenko and the former President V. Yanukovych are not allowed to use the money deposits invested in the foreign banks, Russia is not allowed to receive from the EU countries goods, etc. Sanctions may include ceasing of diplomatic relations, sports and cultural events boycotting, blocking of foreign state and its citizens property. Restrictions on international trade, financial transactions and people movements are the most common form of sanctions.

Sanctions are an attractive instrument of foreign policy, since, unlike the war, they are used to resolve international conflicts and disagreements with less cost and human sacrifice. Therefore, they are used quite often: in the period from 1970 to 1998, for example, sanctions in the world were applied 117 times [3].

The intensity of sanctions is determined by the damage degree that they may cause a) the country economy as a whole; b) the political regime

or the private interests of politicians' being in power; c) the interests and competitiveness of the individual sectors economy and industry; d) the interests of individual financial and industrial groups, companies, clans [4].

The first sanctions were used at the time of the final world transition to the capitalist development way. In the nineteenth century, sanctions basically took the form of naval blockades. The term «naval blockade» was introduced in 1850 to describe the trade blockade, conducted without war declaration. As a rule, the blockades were carried out by powerful military and economic states and their actions were often considered as international police actions.

Between 1827 and the outbreak of World War I, 21 naval blockades were carried out in the world. The countries that were most often the blockade subjects are presented on the Figure 7.1. As a rule, the great states preferred to act alone, and only 7 times out of 21 acted in the coalition [5].

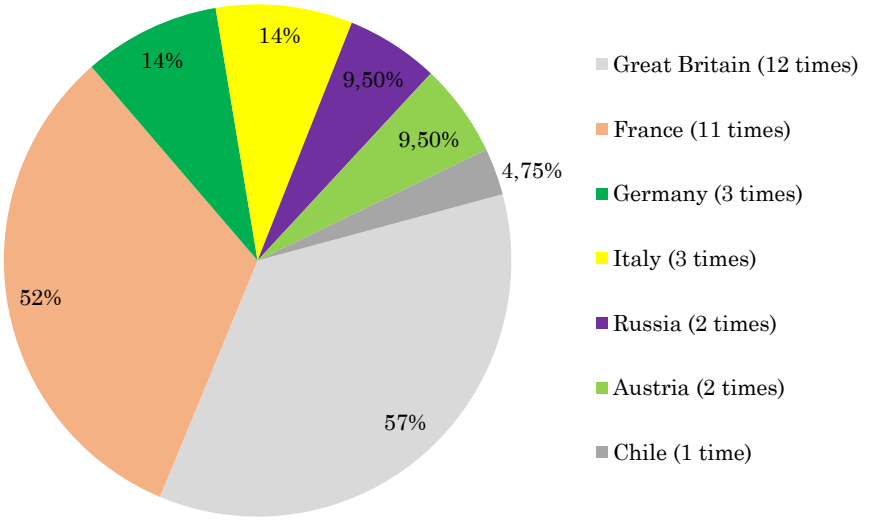

Figure 7.1. Subjects of sanctions in the XIX-early XX century (as some countries participated in the sanctions themselves, and in the coalition, the total sum is more than 100%).

The League of Nations approved the application of collective sanctions in four cases: against Yugoslavia, Greece, Bolivia-Paraguay, and the UK sanctions against Italy in response to Abyssinia capture. The latter case is considered a classic example of the collective sanctions

failure and is often cited as an argument for the economic sanctions weakness as a foreign policy instrument in general.

The practice of applying economic sanctions became much more common after the World War II. The number of cases of imposing sanctions during this period is presented on the Figure 7.2. In the period between 1946 and 1990, The United Nations imposed sanctions only five times: against the DPRK, South Africa, Portugal, Rhodesia and Iraq. During this period, the UN began to apply sanctions more actively, especially to African states [6].

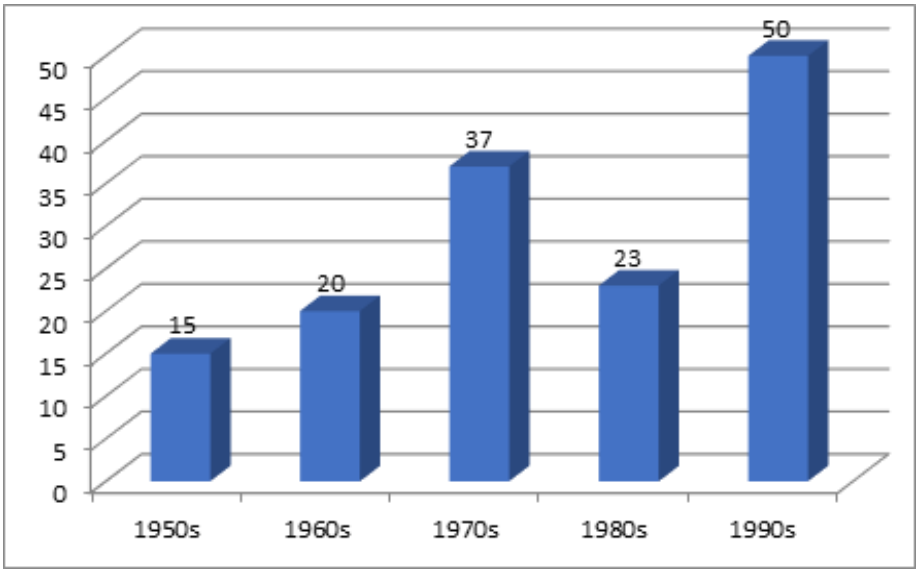

Figure 7.2. The dynamics of the sanctions introduction in the second half of the XX century

Most sanctions were declared unilaterally by the United States, in recent years, Western European countries have become more involved in sanctions, although most often the United States organize coalition for imposing sanctions. As a rule, this country can choose the pressure degree on certain world countries, based solely on their interests. This is because all countries of the world can be divided into three groups; 1) countries, which are relatively independent from the USA – Russia, China, India, France, Italy, Belarus, Sweden and some others; 2) dependent on the USA – the countries of Latin America, Great Britain, Mexico, Poland, the Baltic countries (the real list is larger), now Ukraine

is as well; 3) the countries occupied by the USA – Germany, Japan, Afghanistan, Iraq, Libya.

The political objectives of applying sanctions are presented in the Table 7.1.

Table 7.1. Political objectives of the sanctions application

Target name	Number of cases	Success percent
Policy moderate modification	43	51
Regime change or democratization	80	31
Cessation of hostilities	19	21
Military potential destruction	29	31
Other significant policy changes	33	30

Nowadays within the globalization the country economy is becoming more and more interdependent. In addition to the United States, the Soviet Union had the relative independence those days, which, together with the countries of the social community, had a powerful Council for Mutual Economic Assistance (CMEA) market that could exist independently. More or less independently, countries can feel either with a powerful raw (necessary for everyone) product – oil, gas, ore, cotton, etc., or with a huge amount of consumer goods (China), or countries using high technologies.

The ratio of the economies capacity of the country-subject and the country-object is of great importance in forming the political goal for the country, which imposed sanctions. As it is suggested, trade sanctions are imposed by a country with a larger economy against a country with a smaller economy, thereby making retaliatory measures meaningless.

Some parameters and results economic sanctions applying for political purposes are summarized in the Table 7.2 [7]. The success index is determined by a numerical value from 1 to 16, what is more 16 is the maximum efficiency index. The economic damage to the subject of sanctions is determined by an index in the range from 1 to 4: 1 means the total entity profit of the entity; 2 – a small effect on its economy; 3 – moderate economic losses; 4 – serious losses.

The state very rarely imposes economic sanctions against someone if its own population suffers from them. An exception to this rule were, for example, the allied sanctions against Germany during World Wars, the sanctions of the Arab League against Israel, the US and UN sanctions against Iraq in the 1990s.

Table 7.2. The main economic sanctions imposed for political purposes (until 1990)

Sanctions Subject and object	Years	Index of success	Damage to the object (in% of GDP)	The ratio of the subject's and object's GDP	Damage to the subject (index)
Great Britain against Russia	1918-20	1	4.1	1	3
League of Arab countries against Israel	1946-to present	4	4.1	2	4
USA, Great Britain against Iran	1951-53	12	14,5	235	1
USA against Cuba	1960-to present	1	4.4	173	3
Great Britain and the United Nations against Rhodesia	1965-79	12	13.0	1388	3
USA against Kampuchea	1975-79	1	6.8	2523	1
South Africa against Lesoto	1982-86	16	5.1	103	2
USA, United Nations against Iraq	1990-2003	-	48.0	242	4

The effectiveness of sanctions increases in conditions when sanctions are implemented not by one state, but by the states coalition. International cooperation in the sanctions implementation reduces the political costs for the country-object for their implementation, that is, makes the imposed sanctions somehow more legitimate in the world community and reduces the damage to the political reputation of the sanctions country-initiator.

It is necessary to distinguish the sanctions price for the country-subject and the country-object. Firstly, for the subject country, direct economy losses for the country-initiator should be taken into account, which consist of the decrease in sales and the decrease in revenues, the reduction in the cost of assets in the country-object of sanctions belonging to the companies of the country-subject sanctions and also the losses from the decrease in employment in the country carring out sanctions. Secondly, indirect losses are created to the economy of the country-subject sanctions.

Today, more and more specialists are inclined to the opinion that the sanctions effectiveness is low in principle. Despite this, sanctions are still politicians' favourite tool and the number of sanctions imposed in the world is not decreasing. There are only a few cases, when sanctions

have managed to inflict hard economic losses for the countries-subject of sanctions, and in fewer cases sanctions have forced the country-object to change its policy.

A classic example of sanctions unsuccessful introduction is the American grain embargo against the Soviet Union in response to the invasion of the USSR into Afghanistan. The embargo raised the USSR's spending on imports by $225 million, but did not compel the USSR to leave Afghanistan. Direct losses to the USA of these sanctions amounted to more than $2 billion. American farmers lost this grain market, as the USSR did not longer place orders at the USA market. The data given in the Table 7.3, point to the average effectiveness of sanctions in the XX century, about 30% [7]. It is also clear that the sanctions effectiveness between 1945 and 1970 was higher than after 1970.

Table 7.3. Average data on the economic sanctions effect in the XX century

Periods (years)	Annual number of sanctions	The sanctions success (index)	Damage to the object % GDP	Ratio of economies subject and object	Damage to the subject (index)
1914-1918	0.60	5.67	4.00	5.00	3.00
1919-1923	1.00	16.00	n.d.	37.00	2.00
1924-1928	1.00	16.00	n.d.	56.00	2.00
1929-1933	2.00	9.00	1.50	112.50	2.00
1934-1938	2.00	5.00	0.95	40.50	2.50
1939-1943	2.00	6.50	1.25	6.50	3.50
1944-1948	7.00	6.29	0.70	26.06	2.29
1949-1953	3.00	5.00	5.33	208.67	2.00
1954-1958	11.00	6.64	1.31	480.04	1.82
1959-1963	14.00	7.36	1.37	170.14	2.07
1964-1968	8.00	10.00	3.91	251.38	1.88
1969-1973	6.00	7.50	1.18	207.17	1.17
1974-1978	26.00	5.69	0.49	281.27	1.65
1979-1983	17.00	6.53	1.42	2270.43	1.94
1984-1990	1.86	01.05.58	5.56	610.54	1.85

The reason for the gradually decreasing economic effectiveness of sanctions should be found in the nature of the modern globalized economy. The world is gradually becoming a single market and the relative dominance of the american economy and economies of political allies in the world is weakening, and since historically most economic sanctions were implemented by them, the sanctions application effectiveness as a whole was declined. Another reason for the limited sanctions effectiveness is that the economic effect of the sanctions application affects the

population of the country-object, rather than its political decision-maker elite. Another aspect is that sanctions tend to be more effective if they are directed against allies. The ally country is less willing to yield the pressure. The ally country, on the contrary, supports broad trade and economic ties, and their limitation will be very painful for it [8].

The USSR economy was tightly linked between the republics by a planning system. After the Soviet Union collapse in 1991, some countries remain more or less economically connected (Russia, Belarus, Kazakhstan, Armenia), others try to reorient themselves in their economic development (the Baltic countries), the third (Moldova, Turkmenistan) want to choose their so-called way, although they do not fully understand what it promises them. Ukraine also belongs to such countries as well. Due to the notorious events of 2013-2014, Ukraine failed to maintain a neutral status and partner relations with the neighboring countries on one hand, and with the European Union and the United States on the other. Hopes that international sanctions application against Russia in 2014 would negatively affects its economic situation and, on the contrary, contribute to the Ukraine economic prosperity were not justified. There was a paradoxical situation: the international sanctions were imposed against Russia, Ukraine reduced goods export-import and transit cargo traffic from Russia, passenger transport flows have decreased significantly, and in the Ukrainian international balance, the trade with Russia increased from one-third to more than half. This is explained simply: the economic balance with the European countries, the United States and others has decreased much more than with Russia, which increased the trade balance of Ukraine with Russia in comparison with 2014. So it turns out that the country, which suggested sanctions imposion, is in the worse situation, Table 7.4 than before sanctions introduction.

Table 7.4. Some socio-economic indicators of Ukraine in 2014 and 2017

№	Indicator name	Comparable Years	
		2014	2017
1	Total gross product (in dollars)	183	93
2	External debt	300	1233
3	The price of electricity per kilowatt-hour (in kopecks)	29	90
4	Number of citizens below the poverty line (in percent)	12	60
5	The price of hot water (in UAH / cubic meter)	25,1	83,1
6	The price of gas (in UAH / cubic meter)	1,1	6,8
7	The average bill for housing and communal services for a square of 72 sq.m (in UAH)	1000	3500
8	Valokordin for 20 ml (in UAH)	12	46

Apparently, Ukraine's desire to enter the European Union was not enough. Ukraine wants to trade with Europe, residents want to go there and eventually live, like, for example, in France or Germany. Though everything was not so simple. Despite the relative rapprochement with the European Union and the United States, none of them are eager to buy AN aircrafts, ships of Nikolaev plant, tractor or tanks of Kharkov plants, or gas pumping stations of Sumy machine-building plant (former named after M.V. Frunze).

Undoubtedly, as a result of sanctions introduction, Russia economic state has not improved since 2014: it urgently has to restore enterprises that produce products that were previously received from Ukraine and some European countries, as well as agricultural products. Whether Russia will be able to complete the import substitution in industry during several years is not yet clear, but in the southern regions of Russia, in particular in Krasnodar Territory, is a real boom in increasing the vegetables and fruits cultivation. In addition, Russia wants to organize oil and gas transportation bypassing Ukraine. In response, Ukraine, intending to increase the gas extraction, buys not quite suitable coal in Africa and North America.

The effectiveness criteria of the economic sanctions application should be correlated with the political goals of applying sanctions (Ukrainian closest partners – the United States hoped that Russia would not be economically able to exist under these conditions and would make political concessions, for example, stop supporting Donbass and would return the Crimea; in response Ukraine would create on its territory a system of NATO military bases, something similar has already been being created on the Black Sea coast near Ochakov), and in this issue there is the greatest confusion: as the result many companies have suffered in The Europe, Ukraine, Russia. If there is the deterioration, then in another place – improvement: the USA, China, some Asian countries are benefiting from the anti-Russian sanctions introduction. Former USA ambassador in The Russia Federation D. Tefft believes that international sanctions against Russia have not lead to drastic changes in the situation in Ukraine, that was the reason of sanctions introduction.

If it is understood the territories returning, sanctions for the whole history have not yet decided anything. For example, sanctions against the DPRK for more than 60 years have not improved the situation in the region, and North Korea in general has only mobilized, becoming a nuclear power (the conflict in the Korean Peninsula area in 2017 is a vivid confirmation). Any territorial conflicts, as a rule, are resolved either by military means, or by independent withdrawal from a certain region, or under external military pressure.

To avoid this, it should be mentioned that: firstly, the sanctions application can lead to hard currency reduction of the country-subject of sanctions; isolation of the country-object of sanctions from international trade flows. Though, these results are not the goals of foreign policy. Secondly, the sanctions effectiveness is assessed in a static manner. Third, in assessing the economic sanctions effectiveness, many experts are tempted to use the publicly stated objectives of sanctions as success criteria. In practice, the sanctions application often pursues more foreign policy goals than officially announced. That is, assessing the effectiveness of the sanctions application for solving foreign policy problems remains as a problem and is solved primarily on an intuitive level.

The only quantitative criteria for assessing the trade sanctions effectiveness is the change in the volume of country goods turnover under sanctions, as well as the dynamics of gold and currency reserves changes. Although such statistics are not comprehensive. Here should be agreed with [4] that, firstly, countries under sanctions often distort or do not fully provide foreign trade statistics to international organizations (for example, Iran during the Iran-Iraq war and Iraq during the time of S. Hussein, when these countries were selling their oil illegally, and any real information on the volume of trade and foreign exchange reserves was available only to the intelligence services of the countries concerned and was not available to the general public). Secondly, sanctions apply to different kinds of movements and unrecognized states, in relation to which international statistics are not conducted and to assess the effectiveness of sanctions using open sources, it is usually not possible.

To sum up, it can be pointed out that the imposition of trade and economic sanctions is not always an ideal political solution and has better chances in achieving results if: the political task of a relatively small adjustment of the country-object policy of sanctions is put; country-object of sanctions does not have the political support of the third party; there is an international coalition – formal or informal in support of sanctions; the country-subject economy of sanctions significantly (by no less than an order) exceeds the economy size of the country-object; the country-object of sanctions is weak politically and economically; both trade and financial sanctions are used simultaneously. In addition, it should be considered that the policy of sanctions, based on the idea of causing as much suffering as possible to the people of the country-object, which imposed sanctions so that the people protest against their government, is quite vulnerable from the humanitarian point of view. As a rule, sanctions, influencing not politicians who make decisions and bear responsibility for them, but non-decision-making civilians, and lead only to a drop in the population living standard, social sphere degradation and

other losses, not compensating them in the future. Often, economic sanctions are declared without preparation, before the elections with the aim of obtaining the voters support at any price [9], which does not always correctly reflect the country-subject interests to the sanctions introduction in general.

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7.2. Innovative compliance of technology to combat corruption

Pererva P.G., Kosenko A.V., Tkachev M.M, Kobieliev V.M.

The term «compliance» appeared in our country with the arrival of subsidiaries of Western financial structures on the Ukrainian market, for which this function is legislatively necessary and, therefore, well-formed [1-3]. The compliance program is an integral part of the activities of Western industrial corporations, and its main goal is to minimize legal and reputational risks arising from violations of professional and ethical standards. Despite the fact that the term «compliance» is practically absent in the Ukrainian legislation, in the professional environment this concept has long been settled (primarily in the stock market, as well as in banks). In addition, the central bank of Ukraine, without introducing compliance

in business turnover, gradually acquaints the banking community with its elements. Currently, he continues the positive practice of disseminating recommendations based on documents developed by the Basel Committee on Banking Supervision [1].

Questions that are in the sphere of compliance were considered by many scientists, among them Belyaev Y.K. [2], Bondarenko Yu. [3], Kirillov R.A. [4], Malykhin D.V. [5], Shalimova M.A. [6], Khramkin A.A. [7] and others [8-10]. At the same time, the questions of adaptation of the main provisions of compliance to practice of domestic industrial enterprises remain practically undeveloped. This provision determines the importance and urgency of conducting such studies.

Compliance is the correspondence of the concrete actions of the enterprise (organization) as a whole, of a separate collective or employee of any rank to any internal or external requirements (laws, standards, norms, regulations, etc.). Compliance refers to the part of the management / control system in the organization that is associated with the risks of non-compliance, non-compliance with the requirements of legislation, regulatory documents, rules and standards of supervisory bodies, industry associations and self-regulatory organizations, codes of conduct, etc. Such risks can ultimately result in the application of legal sanctions or regulatory sanctions, financial or reputational losses as a result of non-compliance with laws, generally accepted rules and standards.

Compliance with laws, regulations and standards in the field of compliance usually refers to issues such as compliance with appropriate standards of market conduct, management of conflicts of interest, fair treatment of clients and ensuring a fair approach in advising clients. Compliance also includes specific areas, such as: counteraction to criminal proceeds and the financing of terrorism; compliance of the company's activities with the current legislation; protection of information flows; countering fraud and corruption; establishing ethical standards of behavior, etc.

The emergence of compliance is associated with globalization and the internationalization of the world financial system. Given the international and transnational nature of many financial transactions, it can be said that the level of non-financial risks has grown significantly over the past ten years. The ideology of compliance calls to comply with the company's internal policies and procedures and is implemented by creating conditions in which persons representing the organization will act in accordance with high professional and ethical standards.

The Compliance System of an industrial enterprise is a universal recognized international system of counteraction to threats and risk management that ensures compliance of the company's activities with the requirements of state bodies, self-regulating public and other organizations,

compliance with the rules of law, rules, recommendations and standards governing the company's activities.

The purpose of implementing the compliance program of an industrial enterprise is the establishment of effective mechanisms at the enterprise to establish and analyze especially corrupt activities, assess and manage corruption risks, provide comprehensive protection from crisis threats, violations of exclusive rights, corporate ethics.

Implementation of compliance at Ukrainian industrial enterprises opens new opportunities for business development, eliminating or reducing risks, improving the quality of corporate governance in general. Table 7.5 lists the main advantages of the compliance program in industrial enterprises and the consequences for enterprises that do not implement and do not use compliance.

Table 7.5. Advantages of the compliance program of an industrial enterprise

Main advantages of compliance	Lack of compliance
1. Prevention and minimization of financial losses, bankruptcy and sanctions in relation to companies from Ukrainian and foreign regulators	1. Greater likelihood of the use of sanctions by regulators / law enforcement agencies
2. A well-established system for detecting and preventing fraud, corruption and other types of threats to business	2. Costs for consultations and violation of activities in the investigation
3. Preservation and development of business reputation of the enterprise	3. The presence of reputational risks affecting the loss (decrease) in the competitiveness (image) of the enterprise
4. Increasing the efficiency of activities, increasing competitiveness, investment attractiveness and enterprise value	4. Decrease in capitalization opportunities, worsening financial performance, enterprise bankruptcy is not ruled out

In addition to the advantages indicated in Table 7.5, compliance programs allow you to obtain broad additional benefits, the essence of which can be reduced to the following achievements:

- loyalty and consumer confidence, expressed in the stability of consumption of the enterprise's products, expansion of its use and consumption volumes, due to the observance of their interests, protection of rights, honest and fair attitude, clean reputation, long-term profitability and quality of services, taking into account effective compliance risk management;

- trust and interest of the shareholder, investor (partner), expressed in financing the development of the enterprise, due to compliance with their interests and protection of rights (in accordance with the requirements of legislation and internal procedures), corporate governance, clean reputation, good operating results and profit;
- the trust and interest of suppliers, expressed in the provision of discounts and the quality of services (goods), due to the reliability of the company and the professional work of its employees, honest attitude to counterparty obligations, compliance with contractual conditions;
- the trust of employees and society as a whole, expressed in the employees 'loyalty to the enterprise and good reputation, thanks to the observance of employees' rights, fair motivational programs and compensation schemes and activities in the field of corporate social responsibility.

Currently, within the framework of the general concept of compliance, there is a significant number of more specific types of it, reflecting a particular area of the enterprise's activities within the overall compliance program (Table 7.6).

In all civilized business community, compliance is actively introduced into the life of business - the anti-corruption policy of the enterprise. This is the development of measures aimed at reducing these or other internal risks, the implementation of which will allow entrepreneurs to manage their business more efficiently, reduce or eliminate costs associated with the negative consequences of "incorrect" behavior of employees, and, most importantly, prevent the occurrence of corruption. The Law of Ukraine "On the Prevention of Corruption", aimed in particular at improving the situation in the field of ethical conduct in small and medium-sized business, introduced as a mandatory norm the participation of legal entities in preventive anti-corruption measures. Even now it can be assumed that Ukrainian legal entities, not having sufficient experience in this matter, face serious difficulties in fulfilling this obligation.

Given the Ukrainian realities, it should be noted that the most popular for this country is quite a new direction - anti-corruption compliance. Ukrainian anti-corruption legislation is in the making, so this kind of compliance is more developed for Western companies that are guided by US or European legislation. In addition, the existence of an anti-corruption program is mandatory for companies participating in state tenders. Another procedure is connected with procurement procedures - compliance of the public sector. And here it is important not just compliance with the law, but compliance with the principles that are laid down in the law.

Table 7.6. Types of Compliance in Compliance with Compliance Risk

Compliance risks	Type of Compliance
Getting bribes by business decision-makers. Bribery of decision-makers at consumer product enterprises. Provision of classified information to third parties for cash consideration or its equivalent Use of the organization's material resources for personal gain or enrichment	Anticorruption
Crimes against the company, involving the company in criminal activities, personal criminal responsibility of managers and members of the board of directors	Anti-criminal
The personal interest of the employee affects (or may affect) the objective performance of his official duties, and in which there is or may arise a contradiction between the employee's personal interest and the legitimate interests of others, capable of causing harm to such legitimate interests.	Conflict
Damage to business reputation, sanctions of state bodies due to violation of the rights of consumers and customers	Reputational (consumer)
Regulations and sanctions of state bodies in connection with violations in the field of corporate governance	Corporate
Violations of antimonopoly legislation	Antitrust
Sanctions for violation of international rules and foreign legislation	International
Tax deductions, financial sanctions and litigation	Tax
Damage to business reputation in the industry business community	Industry
Financial losses and damage to business reputation due to violations of the company in relations with suppliers and partners	Treaty
Prescriptions and sanctions of regional state bodies	Regional
Regulations and sanctions of regulatory bodies	Regulatory
Damage to business reputation due to negative public reaction to the company's activities	Social
Financial losses due to violations of the company in the framework of labor relations with employees of the company	Labor

Citizens of Ukraine have to resort to corrupt practices, even to exercise their legitimate rights. According to statistics, 60.5% of Ukrainians know about cases when bribes were given to make a lawful decision, 47.5% of Ukrainians are aware of cases of bribery for making an unlawful decision [9].

The Ukrainian Institute for Global Development and Adaptation Strategies, based on the data of the study of the level of corruption in Ukraine by the companies Transparency International and the Razumkov Center, summarized the views of Ukrainians on assessing the level of corruption in various sectors and spheres of activity of our country. The dynamics of the values of this indicator for the period 2013-2016. is presented in Table 7.7.

Table 7.7. The level of corruption in various sectors and spheres of activity [9]

Sphere (branch) of activity	Corruption rate indicator, %%		
	2013 year	2016 year	Change rate
	47,3	66,0	+ 18,7 %
Shipboard system	45,4	64,0	+ 18,6
Law enforcement authorities	44,9	56,0	+ 11,1%
State power of the country	40,6	54,0	+ 13,4
Medicine	43,4	53	+ 9,6
The political sphere as a whole	38,3	45,0	+ 6,7%
Political parties	31,5	43,0	+ 11,5
Education	30,2	36	+ 5,8%
The economic sphere of activity of industrial enterprises	19,6	28	+ 8,4 %
Armed forces	15,8	20,0	+ 4,2 %

In the meantime, in Ukraine, it was precisely large-scale pervasive corruption that led to disastrous economic consequences and destabilization of the socio-political situation. According to the study of Transparency International, the most corrupt institutions in Ukraine are the courts, law enforcement agencies, civil servants, the parliament.

According to the research, 68% of Ukrainians are ready to protest against corruption today. About readiness to go out on the street with the protest declare 36% of the respondents. 43% of respondents believe that the level of corruption in Ukraine has increased significantly over the past two years, 74% believe that the public sector is corrupt, and 80% have characterized the government's actions in the fight against corruption as not effective. Only 4% of respondents believe that the state anti-corruption fight has at least some result. At the same time, 83% noted that it is important to have personal contact when dealing with issues in the public sector, and 84% – that the government of the country is run by organizations acting in their own interests.

The paradox is that the most corrupt Ukrainians named exactly those institutions that are essentially called upon to fight corruption, namely: courts (66%), law enforcement bodies (64%), public service (56%), healthcare (54 (53%), political parties (45%), the educational system (43%), business (36%), the military (28%), the media (22%), religious institutions (21%) and public organization (20%).

The growth of mistrust in these areas is provoked by the trend of a sharp increase in bribery, experts say. A significant number of respondents admitted that they paid a bribe when they received services from law enforcement agencies (49%), medical institutions (41%), educational

institutions (33%), land services (25%), registration and permits (22%), courts (21%), tax (18%), utilities (6%). Commenting on the results of the study in Ukraine, the executive director of Transparency International Ukraine stated that the citizens of the country showed the authorities a «yellow card»: «Studies of past years have established that the trust to the church is twice higher than trust in the courts. The current poll revealed that popular moods are deteriorating – 80% think that the actions of the authorities are not effective at all and are sure that several people are controlling the country with an eye on their own interests. Against the background of these disappointing figures, as well as the growing mass discontent of Ukrainians with the actions of law enforcement and judicial bodies, a very serious alarm is the willingness of every third person to go out on the street to defend his rights. The figures show that compliance is an effective measure of combating corruption within each organization and a reliable defense of its interests. The main thing is not to stop there. The card is at risk of becoming red» [10]

At the moment, the methods of countering corruption are only beginning to be actively introduced by Ukrainian companies, however, the organization of the document on the construction of the compliance system never ends. This is a dynamic process: risks change with a change in the scale of the business, with the advent of new types of transactions, with changes in legislation and a competitive environment. And the task of the compliance service is to take these changes into account, restoring its methods of work, reviewing risks and working on ways to enhance the company's corporate culture to a new level.

The technology of anticorruption compliance presupposes the existence of restrictive conditions for certain categories of managers and specialists, as well as individuals to implement the functions of customers and suppliers [7]. The following characteristics are the signs and indicators of the «ideal» anticorruption compliance model.

From the position of socio-psychological factors:

1. Employees of the organization do not have individual socio-psychological signs of «predisposition to offenses».

2. The employees of the organization have a clear and unambiguous negative attitude to corruption.

3. Employee motivation system makes the benefits of corrupt practices incomparably small compared to the benefits received from the organization (in monetary and non-monetary form) in the long-term and short-term perspective.

From the standpoint of technical factors:

1. Modern technical (hardware) and technological means of countering corruption are introduced into the system.

2. The employees are sufficiently competent and professionally trained to effectively apply the available technical (hardware) and technological means of countering corruption.

From a position of regulatory factors:

1. All potentially corruptly dangerous processes of the procurement system are clearly, unequivocally and in detail regulated.

2. The regulations are generally accessible and binding.

3. The staff are sufficiently competent and professional to effectively apply the existing regulations.

From the position of control-repressive factors:

1. All actions related to corruption (misdemeanors and crimes) are clearly and unambiguously identified, their definitions and signs are spelled out in the normative documents. Normally, the responsibility for corruption is fixed.

2. The organization has established and effectively operates a monitoring system and ensures the principle of «inevitability of punishment».

3. Employees know the «anti-corruption» normative acts and there is a system of their regular information about the detected violations.

The dynamics of compliance in various jurisdictions testifies to the consistency and ubiquity of its persecution in various geographic regions, which, on the one hand, contributes to the implementation of the main principle of legal responsibility - the principle of the inevitability of punishment. On the other hand, this shows the consistent formation of a special branch of law, due to the special seriousness and complexity of the nature of the problem, which uses the full range of legal means and, in addition, complicated by the application of specific measures of fiscal, financial and other forms of control. This requires from managers around the world a broad knowledge of national and international law, as well as continuous improvement of the skills of conducting appropriate legal analysis and application of law.

In our opinion, in Ukraine there is no need at the level of legislative regulation to disseminate the experience of credit institutions in building the compliance function for industrial enterprises. This function can be built at Ukrainian enterprises on a voluntary basis, as it is an effective tool for managing legal and reputational risks that arise due to violation of professional and ethical standards, increases the financial stability of the company and the prospects for its presence on the market. All stakeholders are interested in this, including owners, top managers and the state.

Today, compliance throughout the world, and in Ukraine in particular, is becoming more important day by day. In the development and implementation of compliance programs, both owners and top managers

are interested, because usually a violation of mandatory requirements leads to both financial losses of the organization, and sometimes to the liquidation of the organization, to the criminal responsibility of managers.

Working on the creation of a compliance program in an organization must certainly lead to an understanding of its development strategy and success, as it makes it necessary to answer strategically important questions, such as identifying external and internal factors that affect risks, legal restrictions and regulations, judicial decisions, voluntary follow the relevant industry standards. Based on the analysis, compliance policy is being built, a strategic plan and tactics of its implementation are developed, aimed at detailing and addressing compliance risks and achieving compliance goals.

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POSTFACE

This monograph continues the book series stemming from the annual international conference «Marketing of innovations and innovations in marketing» that are conducted by the Department of Marketing and Innovation Activity of Sumy State University (Sumy, Ukraine).

Contributions of our authors, as well as their conclusions and recommendations deepen the theory of innovative management and marketing of innovations via the development and scientific substantiation of new approaches to improving the organizational and economic mechanism of innovative development management of economic entities at different levels. These improvements take into account the peculiarities of technological changes associated with the completion of the 5th and the beginning of the transition to the 6th, as well as the actual beginning of the 4th industrial revolution. Changes initiated by these factors enable both individual organizations and national economies to move to the path of advanced innovation development. It would be unwise not to use them.

The contributions in this monograph are based on the practically-oriented approaches and techniques that can be directly applied for the management of innovative development of economic entities at the state, branch, regional levels, as well as the level of individual enterprises and institutions. Their practical implementation will enable to identify perspective directions of innovation development allowing to outstrip competitors through the effect of «innovative advancement»; to allocate most suitable features for concrete enterprises and institutions using relative competitive advantages or the ability to form them; purposefully manage the development and implementation of innovative strategies that enable the full implementation and strengthening of competitive advantages, to take the position of a market leader, etc. This, in turn, will increase efficiency and reduce the risk of innovation, reasonably develop strategies for the advance of innovative development of economic actors of different levels, ensure their high competitiveness at the domestic and foreign markets and contribute to the economic growth of the country as a whole.

The authors of this monograph focused on a large pool of potential readers represented by scientists, specialists of enterprises and institutions, as well as a wide range of stakeholders interested in the issues of management of innovation development. The authors will be grateful for any critical comments and suggestions that would potentially contribute to deepening and enlarging further research on these topics.

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THEORETICAL, METHODICAL, AND APPLIED GROUNDS

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