



EIROPAS SAVIENĪBA



# **Innovative Management of Business Integration and Education in Transnational Economic Systems**

**Collective  
Monograph**

**ISMA University of Applied Science**

Latvia, 2023

# **INNOVATIVE MANAGEMENT OF BUSINESS INTEGRATION AND EDUCATION IN TRANSNATIONAL ECONOMIC SYSTEMS**

**International Collective monograph**

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ISMA University  
Riga (Latvia) 2023

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## PROBLEMS OF BUSINESS MANAGEMENT IN THE CONDITIONS OF MODERN GEORGIAN OPEN ECONOMY

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### **ABSTRACT**

*The paper discusses the problems of business management in the conditions of the open economy of modern Georgia, against the background of globalization, internationalization and transnationalization of the world economy. Methods of data collection and analysis were used in the development of the paper. In particular, in order to obtain statistical materials in the field of business management of Georgia, the collection method was used, and based on the analysis, the problems in this field were identified and the ways to solve them were determined. The aim of the research of the paper is to reveal the problems of business management in the conditions of the transnational economy and to determine the ways to solve them. To eliminate business management problems in Georgia, it is necessary to improve business communications between Georgian companies. To increase the competitiveness of companies operating in our country, it is necessary to improve communication between their organizational structures (management and personnel), raise the level of education and qualification of management and personnel, develop their professional skills and manage them properly. In the post-pandemic period, as a result of the hostilities of Russia and Ukraine, the developments in the Black Sea region, if properly managed, can be used by the Georgian government to solve problems in the field of business management. This will increase the investment attractiveness of Georgia in the region.*

**Keywords:** *transnationalization, business; management, open economy, professional skills.*

### **INTRODUCTION**

In the conditions of the open economy of modern Georgia, there are many problems of business management, which are determined by the current social-economic, political, criminal and other events in our country. Impeding factors of the business environment in Georgia complicate the management of business processes, which resulted in a sharp disproportion between small, medium and large businesses, mismatch between production and market potential, weak business communication between business managers and their employees, incorrect delegation of rights and duties, Reflection of disagreements arising in the field of business on personal relationships and others. Thus, the problems in the field of business management are very actually for our country.

The causes of problems in the field of business management of Georgian companies are often the low level of development of intelligence and professionalism of business managers and their hired personnel. However, these problems can be solved by providing educational training for business managers and staff.

The existing problems of business management in the conditions of the open economy of Georgia are directly related to the scientific and practical tasks of the main research, because the scientific works of many Georgian and foreign researchers have been processed in this field, and the analytical works carried out by them answer the practical tasks related to the problems in the field of business management.

### **ANALYSIS OF RECENT STUDIES AND PUBLICATIONS**

While conducting research on the problems of business management in the open economy of modern Georgia, the Georgian researcher Maya Aladashvili, in her work: "Problems of Small and Medium Business Management in Georgia" notes that "business management in Georgia is a very complex and dynamic process, which is significantly affected by the current economic and political situation in the country." processes. The fastest negative events affect small and medium-sized businesses, because the management of these types of businesses in Georgia will weaken" (Aladashvili, 2021: 33).

Georgian researcher Otar Gogiashvili, in his work: "Problems of small and medium-sized businesses and ways to solve them in Georgia", notes that "in the conditions of an open economy, small and medium-sized businesses can become an instrument of diversification of large corporations and modernization of the consumer market." The development of small and medium-sized enterprises in Georgia will allow us to effectively solve such important problems as the growth of competition, the formation of the middle class, the employment of the population, the loading of production capacities, the increase of budget revenues and, in general, the solution of the socio-economic problems of the country" (Gogiashvili, 2021: 5). Georgian researcher Nino Evgenidze, in his work: "Factors hindering the development of small business in Georgia", notes that "in Georgia there are such factors hindering business development as: lack of entrepreneurial skills and experience, low labor productivity, low level of innovation, lack of scientific and research institutions and low level of cooperation of the private sector, limited ability to purchase new technologies, insufficient competitiveness of human capital, low level of awareness of foreign markets, limited ability to develop export potential and internationalization, high cost of consulting small and medium enterprises, difficulty of business closure (bankruptcy proceedings), etc. (Evgenidze, 2016).

Professor Ekaterine Kordzaia in her work: "Financial factors of small and medium business development" notes that "one of the important factors hindering business development is the unavailability of finance in local currency, the lack of necessary and sufficient funds for business expansion and the creation of new jobs" (Kordzachia, 2020).

Georgian professor Ineza Gagnidze, in her work: "On the strategy of the development of the economy of Georgia", notes that "transition to a market economy, gaining a niche in the world global market under the conditions of an open economy and establishing a strong presence there requires great efforts of both governments and citizens of any country. Georgia also needs a lot of effort to solve such a difficult task" (Gagnidze, 2007). Scientist Givi Makalathia, in his work: "The role of budget policy in economic growth on the example of Georgia", notes that "business management in Georgia is complicated by the often changing and vague tax system, the high level of the shadow economy, which hinders the development of honest business" (Makalathia, 2020: 61).

Thus, as it can be seen from the analysis of the studies carried out so far by Georgian and foreign scientists on the problems of business management in Georgia, the situation and perspectives created in terms of business development in Georgia are reviewed in detail in their works. In their research, the levers of business management of Georgian companies and the ways of its correct use have been studied in order to eliminate the problems in this field in the country. In the works of Georgian scientists, the problems of Georgian business development and ways to solve them are studied in detail. While studying the business potential of Georgia, Georgian and foreign scientists came to the conclusion that Georgia needs to use innovative methods of business management. Today, the demands made by foreign investors to the Georgian government regarding the formation of the business environment are becoming clear. My vision in the work, unlike other scientists, is that it discusses the prospects of solving the problems of Georgian business management in the new reality of the modern post-Covid period, against the background of the ongoing hostilities between Russia and Ukraine.

The study of the problem in the field of business management in Georgia, to which our article is dedicated, is to take into account the new reality created by the post-covid period and hostilities in the Black Sea region, to find new opportunities and to make recommendations to the government of Georgia in order to use them.

The main goal of the research is to investigate the problems of business management in the conditions of the open economy of modern Georgia and to determine measures to solve them, against the background of globalization, transnationalization and internationalization of the world economic processes.

## RESULTS AND DISCUSSIONS

The economic condition of any country depends on its proper management. Successful management is necessary at any level of activity, in any field, be it industry, agriculture, trade, production of goods or any other field of services. Success in any company can be achieved only by competent business management, because business management is associated with the process of achieving the goal, coordinating the efforts and resources of the performers.

Business management is important not only at the firm (micro) level, but also at the country (macro) level. Table 1 provides information on business management throughout the country, which shows data on the turnover of enterprises operating in the business sector of Georgia, the released products, the number of employees and their salaries as of 2015-2021. In particular. In this period of time, the trend of growth can be observed in all directions (according to all four indicators). The only exception was the decrease in the number of products produced by enterprises operating in the business sector in 2020 (from 47.5 billion GEL to 46.2 billion GEL) and the number of workers employed in them (from 756.9 thousand people to 703.9 thousand people) in 2020 compared to 2019, which is logical. It was during the period of the COVID 19 pandemic. In 2021, the volume of turnover of enterprises operating in the business sector amounted to 150.4 billion GEL. In the same year, these enterprises produced products of 57.6 billion GEL. In 2021, 744.3 thousand people were employed in the business sector of Sakartelo, whose average monthly salary was 1347.6 GEL.

**Table 1. Data of enterprises operating in the business sector**

	2015	2016	2017	2018	2019	2020	2021
<b>Turnover, (billion GEL)</b>	57.0	64.1	71.7	86.6	109.0	114.3	150.4
<b>Released products, (billion GEL)</b>	30.0	34.2	38.2	41.6	47.5	46.2	57.6
<b>Number of employees, (thousands of people)</b>	626.7	666.8	708.2	734.2	756.9	703.9	744.3
<b>Average monthly salary, (GEL)</b>	896.8	938.3	1019.7	1101.3	1161.7	1222.9	1347.6

*Source: National Statistical Service of Georgia (2022).*

Table 2 provides information on business management at the macro level, which shows the data of enterprises registered in the Georgian Business Register as of 2015-2021, which provides information on the number of organizations (including operating companies), the number of business entities (including operating businesses), newly registered activities (including the number of newly registered businesses). Like the business sector, here too, all indicators are mainly characterized by an upward trend. In particular, in 2021, 847.2 thousand organizations were registered in the register, among which 183.3 thousand companies are active. In the same year, 807.2 thousand business entities were registered in the business register, of which 177 thousand business entities are active. In 2021, 52.5 thousand business entities were newly registered in Georgia, of which 51.2 thousand business entities are active. As can be seen from the data in Table 2, the newly registered business entities in the post-covid period maintained the status of operating businesses at a high level, considering the instability of the post-covid period.

	2015	2016	2017	2018	2019	2020	2021
<b>The number of organizations is one thousand</b>	594.5	632.1	677.6	721.4	764.7	801.5	847.2
<b>Among them: operating companies, thousand</b>	164.5	167.6	165.3	165.6	174.4	173.8	183.3
<b>Number of business entities, thousand</b>	564.8	599.6	642.6	685.2	727.2	762.8	807.2



<b>Among them: operating businesses, thousand</b>	158.1	161.0	158.8	159.0	167.9	167.5	177
<b>Newly registered business entities, thousand</b>	45.6	48.1	52.5	51.6	50.7	41.4	52.5
<b>Among them: new business entities, thousand</b>	43.8	45.2	49.9	50.2	49.4	40.2	51.2

**Table 2. Data of enterprises registered in the business register**

*Source: National Statistical Service of Georgia (2022).*

As can be seen from Table 2, out of 807.2 thousand business entities registered in 2021, only 177 thousand business entities are active, i.e. 21.92% of the total amount. The rest of the small enterprises have suspended their activities. This fact has a negative impact on both employment and the country's economic growth rates.

The reasons for such mass closure of small businesses are problems in their management, such as: limited access to long-term financial and investment resources, lack of long-term credit resources, often changing tax system, political instability, low level of competition development, inappropriate support for small businesses, high level of dependence on imports, business in the informal sector functionality and more. "For long-term business financing in our country, it is necessary to prepare a package of investment projects and present them to investors, which are aimed at increasing the company's productivity, competitiveness of products and promoting technological modernization" (Georgia, 2021).

To the extent that Georgian companies have limited access to financial resources, they do not have the necessary funds for the purchase of new technologies, and the payment of these costs is beyond their reach. Consequently, they do not have the financial resources to cover the costs of consulting services for small and medium-sized businesses, and receiving this type of consulting is an expensive luxury for them. They cannot afford to cover the very high cost of this type of service.

In order to improve access to finance, it is necessary to promote the development of intermediary financial institutions and mobilize investment resources. Both short-term and long-term loans should be made available on the financial markets of Georgia and thus respond to the different needs of enterprises at different stages of development.

One of the main factors complicating business administration in Georgia is the often changing and unclear tax system. A transparent tax regime can become one of the contributing factors for simplifying business administration. In addition, by reducing the types and rates of taxes, the government of our country can create a more favorable business environment for companies operating in Georgia, through the liberalization of the tax system.

Another factor causing business management problems in Georgia is the low level of competitiveness of the private sector. To eliminate this problem, it is necessary to support the development of export, innovation, new technologies, small and medium-sized businesses, improvement of the investment and entrepreneurial environment, development of enterprise infrastructure, utilization of Georgia's transport potential and others. In order to improve business management in our country, it is necessary to create service support conditions for start-up, successful small enterprises.

Lack of capital or financial resources is the main problem of business management for companies operating in Georgia, which have to mobilize their own capital and resources for business creation or expansion. In addition, due to the high rate of interest, the high cost of bank loans, low profitability of the business, and the requirement of collateral by the banks are a problem for the start-up business management, as they are considered high-risk enterprises from the point of view of withdrawing the issued credits. Therefore, access to finance is a problem in the process of managing small and medium enterprises.

The problem of business management in the tourism sector is the unstable political environment. Frequent strikes, government coups, riots, thefts, robberies, robberies cause tourists to be "intimidated" and run away from the country. Political risks of this type are not foreign to Georgia. Unfortunately, robberies and murders of tourists rarely happen in our country. The political tension within our country is reflected in operational decision-making in the field of business management.

In 2016, the government of Georgia developed a strategy for promoting the development of small and medium-sized businesses, although significant changes in its implementation have not been observed yet. However, the development of small and medium-sized businesses is one of the main requirements for joining the European Union. The share of small and medium enterprises in the total number of enterprises of our country is small. According to this indicator, Georgia is significantly behind the indicators of the EU countries. In particular, more than 50% of the total turnover of the entrepreneurial sector in EU countries, and two out of every three jobs are created in small and medium-sized businesses. In the countries of the Organization for Economic Cooperation and Development (OECD), more than 99% of companies are small and medium-sized enterprises, which make up 2/3 of the GDP.

One of the main problems of business management in Georgia is functioning in the informal business sector, especially in the regions, taxi business, tutoring activities, apartment rental and agriculture sector. Being in the informal sector of business is one of the main reasons why the share of agriculture in business production, according to the official data of the National Statistics Service, is only 8-9%, while in reality more income is created in this sector.

Due to the 30-year history of transition to a market economy, Georgian businessmen have less experience in business management, lower entrepreneurial culture and skills. This time was not enough to accumulate proper experience and develop entrepreneurial skills. Accordingly, products made by firms operating in Georgia have a low level of competitiveness in the key market, and Georgian companies have a low level of rating and, accordingly, less awareness in the world market.

The companies operating in Georgia cannot ensure the full-scale workload of the personnel hired by them, due to the incomplete utilization of the production capacities. Accordingly, the productivity of employees in Georgian companies is low.

The companies of our country have two sources of mobilization of financial resources: internal and external. Due to the low incomes of the population, the possibility of mobilizing free monetary resources inside the country is limited, therefore the only real source of mobilizing finances is attracting financial resources from abroad, which are attracted by offering a high interest rate, although the high interest rate actually balances the high level of risks that exist in the Georgian economy. . Therefore, after balancing inflation, currency devaluation, political instability and other risks, foreign investors may actually be left with a lower rate of return than they would receive in other countries. (Charaya V., 2015:127)

Companies operating in Georgia, due to the small scale of their activities, do not have their own scientific-research base and test-construction laboratories, therefore, the level of innovation and research in our country is low. The reason for this is that the cooperation between scientific research institutes and the private sector is weak. The problems faced by companies operating in the private sector during their business management are often not at all the scope of research of scientific-research institutions, and what is traditionally studied by scientific institutions does not at all relate to the problems of business management of companies operating in the private sector. Therefore, the real way to adapt innovation and research to practice is to establish close, bilateral ties between the private sector and scientific-research institutions, which should ensure solving the business management problems of companies operating in Georgia. Georgian companies, due to the limitation of their own financial resources, cannot fill the deficit of their own scientific innovative products even by attracting technology (Davitadze L., 2018).

In addition, although the labor force in the Georgian labor market is quite cheap, it is difficult to find personnel with the desired qualifications for the investor, the reasons for which are improper feedback between professional and higher educational institutions and employers, unprofessionalism of managers, low

qualification level of employees, shortage of personnel with the qualifications desired by employers in the labor market, Inconsistency of the existing demand in the labor market with the qualifications provided by those seeking employment, insufficient competitiveness of human capital according to the qualification/salary ratio indicator (coefficient).

Most of the companies operating in Georgia do not have their own marketing department, but as an ordinary employee, they do not have even one marketer who would conduct a thorough research of the foreign market. The functions of the marketer have been combined with business managers, although none of them has ever fully fulfilled these duties, which is why Georgian companies have a low level of awareness of foreign markets. As a result, Georgian firms do not have the means to fully utilize the export potential in the foreign market.

Another factor hindering the emergence and spread of business management problems in Georgia is the high level of dependence of our country on the import of foreign goods and services, which threatens the self-sufficiency of the population of Georgia with food (Kavtaradze, 2017). Economically active subjects of our country, after gaining the right to conduct business independently, turned to the easy and quick way to get rich - the import of finished products, which is characterized by a much faster return than the incomes obtained from the production of products or the provision of services in the industrial sector and agriculture, which require a much larger capital investment. and requires more time than importing finished products. (Dolidze Kh., 2019:37)

Another problem of business management in Georgia is the wrong approach to business closure (bankruptcy proceedings). The model of bankruptcy proceedings in our country is taken from Germany, where the authorities of that country are focused on preserving business, so they allocate subsidies to artificially maintain the viability of dying businesses. In Georgia, the situation is completely different. While waiting (attempting) to receive a subsidy, enterprises artificially delay their business in bankruptcy mode in order to prolong receiving a subsidy from the government. Instead of worrying about getting out of the crisis, as is happening in Germany. Our country's companies in crisis are trying to adapt the created subsidized situation to a "greenhouse environment" and to maintain such "greenhouse" conditions for a long time. Therefore, the transfer of the economic model of other countries, not only for bankrupt companies, but also in other areas, is not justified, because their mechanical "implantation" in the Georgian reality, without taking into account the local specifics, will obviously not be justified.

A discussion based on the analysis of the research results of the paper. Based on the discussion, it was determined that business management in Georgia is a very complex and dynamic process, which is significantly affected by the current political and economic events in the country. These events and negative processes especially harm small and medium-sized businesses, because management in this area of business will be relatively weakened. The main feature of small business enterprises is their great sensitivity to any changes in the economic environment. As the market economy is characterized by cyclical nature of development, therefore, the problem of survival of a small enterprise is the existence of such reserves to pass the period of decline and wait for the period of revival and recovery of the market.

The fact that over a long period of time only 21.92% of registered small enterprises maintain their existence and continue to function effectively, and it has a negative impact on the development of employment and the well-being of the population, ultimately having a devastating effect on the development of the country's economy. However, the development of small and medium-sized businesses is vital for our country, because "small and medium-sized enterprises are often called "hidden champions" because their share in the world market is more than 50%, their goods and services are "invisible" and less noticeable, they are characterized by durability and a high level of vitality, have a significant export share, are global competitors and contribute greatly to the country's balance of success."

80-85% of all economic activity in Georgia comes from big business. This means that small business is not well developed in the country. However, it is also worth noting the fact that this business brings serious income to our country, and if the country's population still manages to survive despite extreme poverty, it is

also thanks to this type of business. A large part of the population is employed in small businesses. Based on all of the above, small and medium business is vital for Georgia as well.

As practice shows, small business is characterized by certain disadvantages, among which are: a higher level of risk, which leads to less solidity of the market situation; heavy reliance on large companies; Mistakes in managing one's own affairs; Weak competence of managers, increased sensitivity to changes in farming conditions; difficulties in borrowing additional financial funds and obtaining credits; Less self-confidence of business partners, caution when concluding a contract, etc. At the same time, it should be taken into account that the reason for the sharp disproportion between small, medium and large businesses is also the mistakes made in the management of this area and the shortcomings in the same area.

The crisis of business management in Georgia is caused by the fact that the management system was unable to recognize and quickly assess business situations, generate and implement effective decisions. Achieving compatibility between production and market potential is one of the most important, unsolved problems of Georgian small business management, as it requires solving many operational and strategic tasks related to determining the type of business, the composition and volume of resources (material and immaterial), and their combination. Unfortunately, Georgia still does not pay proper attention to the selection of the line of action in the market and the use of innovative strategies, the purpose of which is to create a competitive advantage for domestic enterprises. It can be achieved by the formation and systematic improvement of the management mechanism, the quality performance of management functions, the improvement of the material-technical base of management and the use of modern technologies.

Informational and labor processes in the unified system of business management show how successful the company's activities are in the market, how well the released products correspond to customer demand. The level of business management is ultimately reflected in the management's ability to generate and realize competitive advantages. If we take into account the dynamism and difficult predictability of the modern economy of Georgia, the formation of the strategic model of the company is a difficulty. Therefore, it should be based on the concept of strategic management, which is considered the pinnacle of business management.

A number of problems in organizations operating in Georgia are the same as in other countries in the same phase of development, however, the national character and cultural features of our country, traditions and history of doing things have a special influence on the specifics of the work of Georgian organizations. One of the most common practices in small and medium-sized enterprises operating in Georgia is hiring relatives, friends, their children and relatives as employees. It is this practice that leads to such obvious shortcomings as improper discipline and unprofessionalism. It is worth noting that this tendency starts from the first person, when he misuses his official authority and uses it to help his friends or family relatives. This tendency can fill the organization with inadequate, undisciplined and incompatible personnel, which can lead any enterprise to a serious internal crisis.

Incorrect promotion of people is also a common business management practice of companies operating in Georgia. Management selects for promotion people who have distinguished themselves by doing this or that job to a reasonable standard, but unfortunately all too often this does not mean that they will be good managers. Most of them continue to carry out their assigned tasks independently, instead of involving subordinates.

Another problem of business management of companies operating in Georgia is insufficient delegation, i.e. transfer of authority, when the management cannot actually entrust decision-making to subordinates, and even minor decisions are made by the upper management level. Any bold initiative from the employees is ignored and not implemented, as a result, the newly arrived and enthusiastic employees soon lose their enthusiasm for taking initiatives and join the ranks of other passive employees.

A not insignificant problem of business management of companies operating in Georgia is weak communication between the manager and the ordinary employee. The management is detached from the real problems and they are not aware of what their employees want, what their customers want, what are the problems in the company in general, and so on, which in the end can cause a serious internal crisis.

The most serious problem of business management of companies operating in Georgia is the unclear structure, undifferentiated or wrongly separated rights-duties and responsibilities. Most of the employees do not know what they are asking for and what they expect from him.

This applies to both ordinary workers and members of management. Sometimes no one does what needs to be done urgently, but they are busy doing the same, routine thing. Due to the unclear structure, most of the companies operating in Georgia have no idea what their long-term and medium-term goals are, what they are working for and for whom, what they want to achieve. This reduces the pace and efficiency of the organization.

A common problem of business management of companies operating in Georgia is the wrong work mode. Very often, the working day starts only at 12 o'clock. It is true that the working day may extend to 9-10 hours if necessary, but such a mode of work will never be effective in the long run and such organizations will never achieve much success.

A big problem for the companies operating in Georgia can be the frequent ignoring of the clients' interests, their improper assessment and failure to consider their wishes. Unfortunately, many Georgian enterprises forget that the main component of business existence is the customer, and all major decisions in the company should be related to their wishes and needs. Failure to consider them will make it very difficult to implement the company's long-term plans and succeed.

The reflection of business and competitive relationships on personal relationships has a negative impact on the results of the companies operating in Georgia. Competition often turns into personal disagreements. And personal conflicts quickly lead to confrontation, which can become the cause of internal organizational crisis.

Experience shows that the cause of all critical problems of any organization originates from problems in the level of managers' education, strategy, structure, and corporate culture.

## **CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH**

We touched on such problems of business management, which are most typical for companies operating in Georgia, which have a particularly negative impact on their current activities and drastically reduce the productivity of their activities. However, it is possible to take into account a number of factors, which are vitally necessary for the normal management of the businesses of these companies: In particular, in order to actually solve the problems discussed above in the field of business management of companies operating in Georgia, the measures to be implemented should be divided into two directions of research - macro and micro level. In particular, Macro-level measures include the following:

1. It is necessary to rank the problems of business management in the conditions of the open economy of Georgia according to time, and the measures aimed at their elimination should be carried out consistently, according to the approach of threats;

2. It is necessary for the government of Georgia to have an adequate vision and approach to the elimination of factors hindering business development, because the problems of business management in our country need to be studied in dynamics;

3. The Government of Georgia should minimize the threats that may accompany external shocks (financial crisis, decrease in demand on foreign markets), possible slowdown of economic growth and political instability;

4. By forming a favorable business environment, the government of Georgia should promote the increase in the level of investment in small business; expansion of export opportunities; increasing the competitiveness of companies; adaptation to DCFTA requirements; increasing the participation of the private sector in research; to deepen the level of knowledge among local producers about the requirements of export markets.

And the measures to be held at the micro level include the following:

1. When managing the company's business at the micro level, the main focus for the manager should be to understand why this organization exists, why it was created and what benefits it creates for clients. It is necessary to listen to the opinion of customers and understand the real reasons why they chose this organization, what they think about it and how to propose a better cooperation with it. Considering the opinions of users is necessary for the long-term existence of the organization, as well as for solving current problems;

2. For the quality management of the company's business, it is necessary from time to time for the manager to look at his organization with an external, i.e. foreign, eye. The fact is that a manager immersed in work for a long time gets used to the daily activities of the organization and no longer notices important problems. That is why it is necessary, from time to time, to look at the business of one's company with an outsider's eye or to understand the opinion of those who observe the business activities of the organization from the outside.

3. Raising the level of education of their owners (who, as a rule, also perform the functions of managers) is of crucial importance for solving the problems faced by the business management of small and medium-sized enterprises. This will be facilitated by their inclusion in professional educational programs established by the state, in order to receive specialized professional education. The requirement for the owner of a small and medium-sized enterprise to have a manager, even if he has a minimum qualification, should be strengthened, at the legal level, at the moment of registration of the small and medium-sized business.

Taking into account the recommendations listed above, on the part of the government of Georgia at the macro level, and on the part of the owners of small and medium enterprises at the micro level, will contribute to the elimination of problems in modern Georgian business management, achieving long-term success in the management of the open economy of our country, and beneficial changes in the development of small and medium businesses.

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## THE ROLE OF A PROFESSIONAL PROJECT MANAGER AS THE KEY FUNCTION IN BUSINESS PROJECT MANAGEMENT

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### **ABSTRACT**

*In order to comply with the government regulations during Covid pandemic, the companies, existing in the paralyzed world, have changed the communication channels, the principles and methods of company management to adapt to difficulties for the implementation of business projects and business processes, which undergoes the transformation and increases the demand for professional project managers in accordance with the development of digital and technological processes in post-covid period. Depending on the actuality of the issue, in the paper, there have been studied the problems, existing in the business project management around the world, including Georgia. Characteristics of business projects management have been analyzed before, during and post-COVID-19 period. At the modern stage, the role, skills and importance of a professional project manager have been studied as a factor determining the effectiveness of project management. There have been determined the advantages and disadvantages of “traditional or waterfall” and “flexible or Agile” management methods of business project management. The advantages of the new method of project management, formed as a result of combination of the main elements of “traditional” and “flexible” management methods of business project have been evaluated. The growing demands of the labor market on professional project managers have been studied, who have the ability of traditional, digital, technological, transformational, virtual collaboration, emotional intelligence, resilience and adaptability, time and financial resource management, critical thinking, creativity, task delegation and data analysis skills.*

**Keywords:** *business project management, post COVID period, professional project manager, “waterfall” and “Agile” management methods.*

### **INTRODUCTION**

The world, we live in, is constantly changing and “Era of modern project management” is named as a determining period of the rapidity of these changes in economic science and practice, which began in 50s of the XX century and was significantly developed in XXI century. Implementation of the local and international business projects under the conditions of market economy is considered as one of the important tool of country’s development and economic growth. It should also be noted that, the implementation of the projects by business sector, on the one hand, is based on the creation of “personal welfare” for the manufacturer, which is offered to the customers in the form of “non-contradictory welfare” in order to make maximum profit. On the other hand, companies try to quickly adapt to market challenges in the global environment by implementing business projects, in order to be able to maintain, gain leadership positions in the competitive market in accordance with the changes of both internal and external factors and also despite the difficulties of project management as well.

The surveys show that, the number of business projects, implemented in various field in Georgia, like the countries of the world is increasing before and after Covid pandemic period and it will increase even more, what is caused by the increase in demand professional staff, including professional project managers by creating high-paying jobs.

During COVID-19, the business sector, which was under the conditions of complete mismanagement and strict regulations, increased the demand on the one hand, on project managers having modern management skills and on the other hand, he began the improvement of project management methodology according to the business projects, implemented in each field and sector, which was based on the combination of important elements of “traditional” and “flexible” management methods in order to adapt the environment.



The new management method ensures the implementation of the project in remote and hybrid regime, which should be based on both the effective management of time and financial resources as well as the production of quality-oriented projects with a motivated team.

Practice shows that, the problems, arose in project management have been increasing from the second half of the last century till today, which are revealed in the management of time, financial, labor resources, knowledge, skills, quality, communications, risks, parties interested in projects (partners, clients, state, customers and others).

By analyzing the results of a study conducted by Anderson Economic Group (AEG) in 2007, it was determined that problems in project management have been revealed not only in developing but also in developed countries. In particular, USA, Germany, China, India, Japan, Brazil, United Kingdom, Canada, Australia, Saudi Arabia, UAE and others have been implementing project management through the practical realization of methodological principles since 30s-40s of the 20<sup>th</sup> century, but nevertheless nowadays there are many problems in project management.

When identifying problems in project management, unprofessional project managers were named as the main problem of ineffective project management, who do not have the ability to quickly respond to internal and external factors in a changing environment, skills of stress and emotion management, creativity, effective management of resources, proper distribution of functions among the team members, decision-making, analyzing the results and so on.

Thus, effective project management has always been and continues to be irreversible in compliance with time and space and the person, who has always been and is responsible for successful project management is a project manager, who should provide the project with the required resources, manage effectively the team, motivated by him in order to get the final result of the project “individual, unique product or service” and to satisfy the client’s requirements and “expectations” as well.

## LITERATURE REVIEW

The era of modern project management started from 50s of the 20<sup>th</sup> century. In this period, the meaning of the word “project” has changed compared with the earlier centuries and it includes both projects and facilities as well.

In early civilization, the meaning of the word “project” was the plan of something and not the real implementation of this plan and “the final result”, got through the realization of the project, was named the “facility”. The projects were mainly managed according to the methodologies developed by the persons responsible for the projects - project managers. The examples of such persons are Vitruvius, an ancient Roman writer, architect and scientist in the 1<sup>st</sup> century BC, in 1632-1723 – English architect Christopher Wren, in 1757-1834 - Scottish civil engineer and architect Thomas Telford, 1806-1859 - English civil engineer Isambard Kingdom Brunel.

In the project management world, even today there are still practical concepts “project facility”, “project manager”, which reflects the old usage of the word [17]. Nowadays, in the field of science and for professional project managers, the most problematic issue is on the one hand, according to all branches and areas of business, there should be developed such combined methods of effective project management, which shall be subject to practical realization to obtain the final result of the project “individual, unique product or service”. On the other hand, the most difficult and problematic issue is how managers can effectively manage a team in a rapidly changing environment to achieve project goals.

It has been more than two decades that Georgian scientists and economists have been interested in the mentioned problematic issues. Georgian scientists, who are actively involved in project management research issues are: G. Keshelashvili, N. Paresashvili, I. Chkhaidze, L. Kokiauri, B. Gechbaia. I.G. Shikhashvili, M. Gedevanishvili, K. Rusidze, E. Turkia, G. Amkoladze, T. Amkoladze, N. Giorgishvili, M. Lomsadze-Kutchava, I. Poratni, G. Tkeshelashvili, D. Chkhaidze and other scientists.

The field of scientific research is – IT business projects in one of Georgian scientists and economists, E. Turkia's (book "automatization of technological process of business-project management", 2010), which is considered as a model of quick and correct response to changes in global competition and dynamic business environment conditions [15].

The field of scientific research for the scientists G. Keshelashvili, N. Paresashvili (in the book "project management") is organizational development business projects, which are reviewed as a set of interrelated measures to be implemented in a strictly defined period of time, which will be carried out to achieve the goal defined in accordance with the strategic plan of the organization [9].

The field of scientific research of the scientists G. Shikhashvili, M. Gedevanishvili, K. Rusidze (in the manual "project management", 2012) is discussion and analysis of innovative business projects from the origin of the business idea to practical realization [3].

The field of scientific research of the scientists G. Amkoladze, T. Amkoladze, N. Giorgishvili, M. Lomsadze-Kutchava (in the manual "Competitiveness. Quality and project management", 2009) envisages that companies should always take care on the quality of the project and its development during the implementation of business projects in order to obtain or maintain competitiveness in the market [1].

It should also be noted the opinions of foreign scientists and economists: I.I. Mazur, V. D. Shapiro, N.G. Olderoge, V.D. Shapiro, P. Martin, K. Tate, B. Davis, C. Griffin, M.Roldan, R. Jiwat, G.Mckay, A.Jager, Y.Schoper, A. Wald, H.Ingason, T.Fridgeirsson.

I.I. Mazur, V. D. Shapiro, N.G. Olderoge, they form the explanation of system view of the project in the book "project management" (2006), which requires the implementation of four sequential processes: 1. "beginning" or "origin of the client's demand"; 2. Use of the factors, ensuring the project (people, knowledge and experience, new technologies and etc.); 3. The use of limiting factors of project management (financial, legal, environment, time, quality level and etc.); 4. "The completion" of the project or satisfaction of client's demand.

"Project Management" is defined as applying knowledge, experience, skills and methods to project activity in order to meet the needs and expectations [11].

Thus, there is no specific definition of business projects in economic science, one group of scientists defines it in compliance with the field of study, the second group of scientists analyzes the difficulties arisen during the phases of the project life cycle. Despite of the different fields of scientists' research, they finally come to the common opinion that a business project is created from an innovative idea, which requires effective management of the project by professional project manager to get final "individual, unique" result.

B. Davis, C. Griffin, M. Roldan, R. Jiwat, G. Mckay, A. Jager, Y. Schoper, A. Wald, H. Ingason, T. Fridgeirsson The field of science research is the study of methodological principles of project management at the modern stage [5,6].

Except Georgian and foreign scientists and economists scientific works, theoretical and methodological basis of this work are: the data of the National Statistics office of Georgia (2019-2022), the Ministry of Economy and Sustainable Development (2019-2022), "legislative and subordinate acts, resolutions, ordinances and etc., researches of governmental, non-governmental and international organizations, studies conducted by the authors.

Economic and statistical analysis and synthesis methods have been used in the paper for the proper management of the research process.

## RESEARCH RESULTS AND DISCUSSION

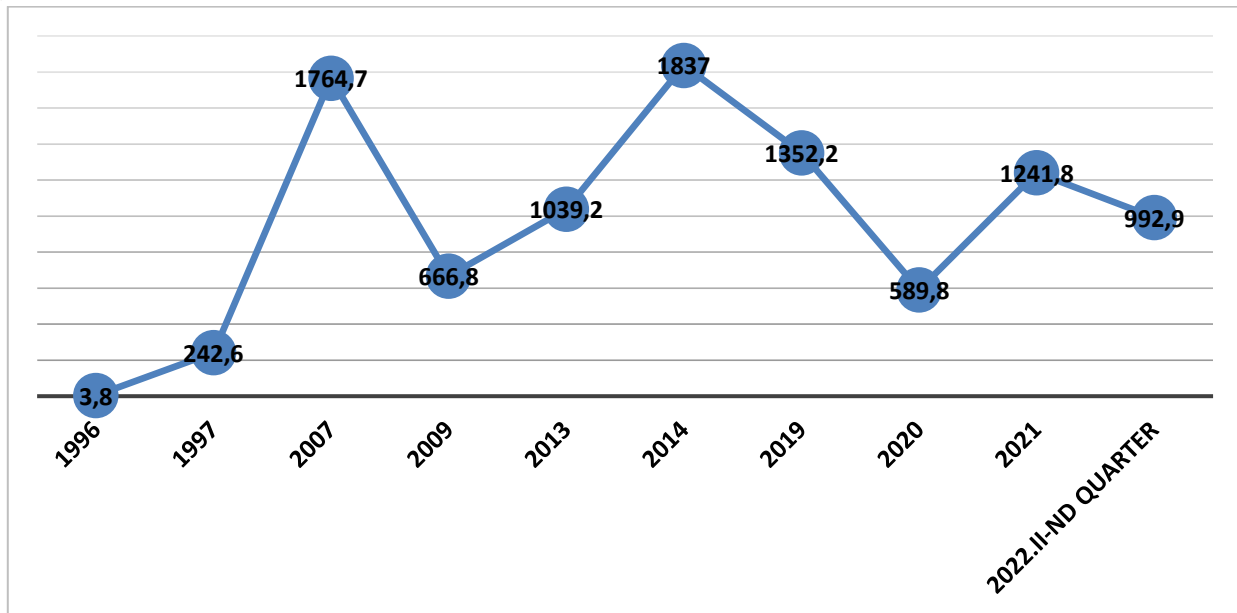
At modern stage, against the global transformation ongoing in the world, the development of business sector and economic growth rates of the country can be reached by creating an attractive business environment for all countries, including Georgia, what will assist the business to attract financial sources in different fields and sectors and realize business projects. The sources of funding for the implementation of business projects in Georgia are the programs launched with state support.

Namely, the total loan issued for financing of innovative business projects by “Startup Georgia” in 2014-2022 (according to the data of second quarter) consists of GEL 51 040 000 and the total loan issued by “Enterprise Georgia” in 2015-2019 consists of GEL 72 949 474, in 2020-2022 – it exceeds GEL 380 296 471 (according to the data of the second quarter).

One of the most important sources is foreign direct investment together with the used private capital and bank loans for funding the business projects, which began to flow into Georgia at the transition period of the market economy as far back as 1996 and significant growth trends of FDI are fixed in 2006-2007. According to the data of the National Statistics Office of Georgia, the amount of foreign direct investment was reduced with 37,8 % in 2009 compared to 2007 (1764,7 million USA Dollars) and consisted of 666,8 million USA Dollars, what was due to Russo-Georgian war.

There was a significant growth of FDI in 2014 and it was increased with 87 % compared to 2013. 21 % of investments were made from Netherlands and 19 % - from Azerbaijan. An important influence on the growth trends of FDI had the evaluation of the results of joint research of GII report by Cornell Institute, World Business School (INSEAD) and World Intellectual Property Organization (WIPO) [18], on the basis of which, it was determined that in 2007-2013 Georgia belonged to a rapidly developing country, which was studying to become innovative. All of these created an important lever for investors to make proper decisions, privately, on the implementation of new financial investments in the economy of our country.

FDI was reduced with 32,1 % in 2020 compared to 2014. The dynamics of decline was caused with global pandemic of Covid-19. The amount of FDI was increased with 110% in 2021 compared with 2020 [20]. The largest investor countries in Georgia in 2021 were the United Kingdom - with 88.4 million US Dollars, what was 70.5 % of the total foreign direct investments, Russia – with 31.9 million US Dollars (25.4 %), Turkey – with 25.4. US Dollars (19.5 %). According to the 3<sup>rd</sup> quarter of 2022, FDI consists of 923 million US Dollars, while this indicator was not higher than 589,8 million US Dollars for 2020 (Fig. 1).

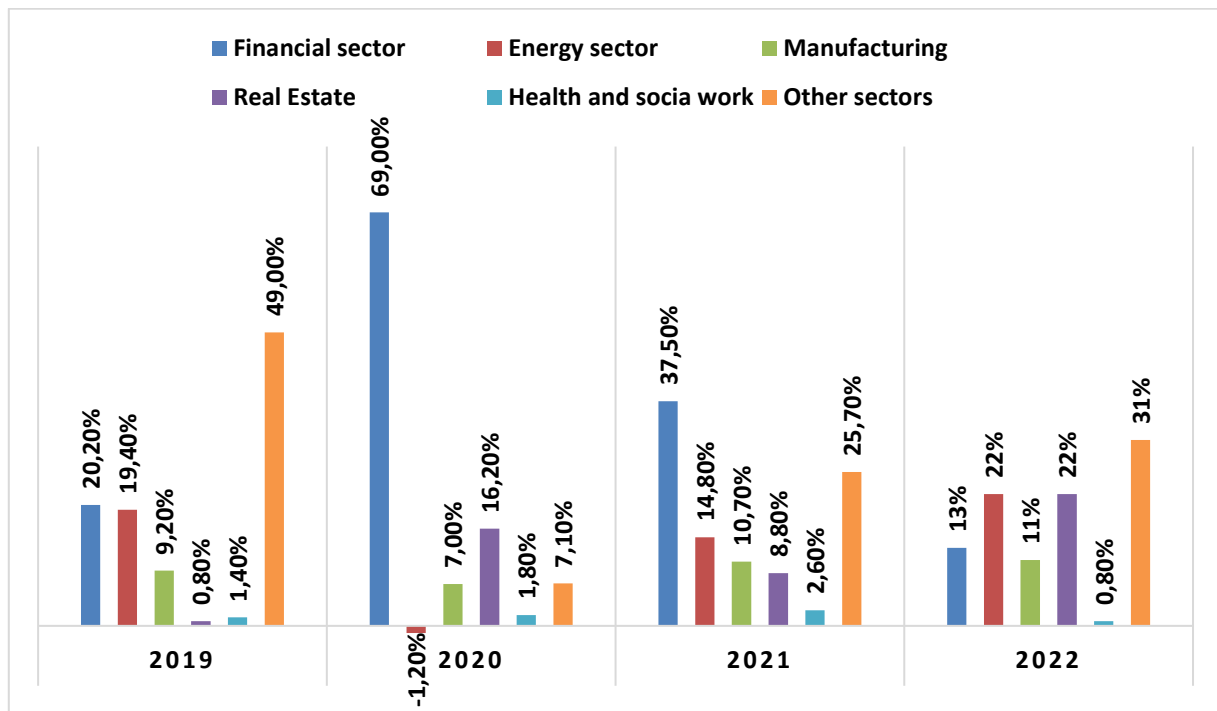


**Fig. 1. Direct investments made in Georgia 1996-2022 years (million USD)**

Source: National Statistics Service, 2022

According to the largest sectors of the economy, FDI increased in the financial sector with 48.80% and in real estate – with 15.40% in 2020 compared to 2019 based on the data of the National Statistics Office of Georgia. This trend caused a significant reduction of the specific share of FDI in other sectors of economy, one of the important reasons of which is called the Covid pandemic process, what paralyzed the economical sectors. FDI was reduced in financial sector from 69,00 % to 37,50 % and in the real estate – from 16,20 %

up to 10,70 % in 2021 compared to 2020. At the same time, there is a significant increase of FDI in energy industry - up to 14.80%, in manufacturing - from 7.0% to 10.70%, in other sectors - from 7.10% to 25.70%, also according to the data of the second quarter of 2022, the growing trends of FDI was noticeable (Diagram 2). The growing trends of a specific share of FDI in economic sectors were caused by gradual abolition of state regulations in parallel with the slowdown of the Covid pandemic processes, transition to an active business environment based on state policy, activation of a private sector and make the investors interested in sectoral economies in Georgia.



**Fig. 2. Fedi in Georgia according to economic sectors million USD**

Source: National Statistics Service, 2019-2022

Despite of implementing many business projects in FDI investment and sectoral direction in the largest economic sectors of Georgia, the problems in project management have still been increasing. In 2018, by inquiring up to 50 practitioner project managers in the “Management Academy, it became possible to learn the problems, existing in project management. In particular, the basic problems were identified as follows: incorrect and inaccurate determination the project goals; general planning and lack of control system of changes in it; determining unrealistic deadlines; improper or inappropriate communication; changes ongoing in the sector; inadequate management of existing and expecting risks; mismanagement of working process; violation of the teamwork principles; Low level of responsibility; Making wrong and premature decisions; Lack of unexperienced practical workers and lack of qualified staff; Disbursement of the budget without considering the set goals; vagueness of quality; unsatisfaction of the interested parties requirements and others.

According to the results of the survey, conducted by us, it was determined that factors, causing the problems in the projects, implemented in a separate field of economics are: on the one hand, lack of qualification of project managers, lack of experience, low responsibility, lack of teamwork skills and etc., what hinders the project manager to work out the effective methods of the project management corresponding to the specificity of the field and act in practice by following the relevant methodological principles.

On the other hand, the rights and obligations of the project manager, incorrectly defined by the company’s management, because on the position held, they need a project coordinator, or just an administrator or

a consultant (by analyzing the requirements for the position of PM published on the <https://www.jobs.ge> employment web-sites in Georgia).

In order to correctly understand the role and responsibilities of a project manager (PM), which is inaccurately perceived by employers in the labor market of our country and for the development of the relevant skills for project managers in Georgia, in 2018, on the initiative of a team of professional project managers (there are only 43 certified professional project managers in Georgia), “the representative office of Georgia of the Project Management Institute” was formed [21], the main goal of which is to contribute increasing awareness of project management standards and methodology, also taking care on the development of project managers and sharing professional experience and adopted practices.

On these problematic issues, Anderson Economic Group (AEG) conducted the survey about “the managers skills gap” into two steps in 11 countries (China, India, USA, Japan, Brazil, Germany, United Kingdom, Canada, Australia, Saudi Arabia, UAE), ordered by the latest PMI, (I step – in 2008-2012, II step – in 2017-2027). According to the analysis of the results of the survey, one of the main problems is the “reduction of the talent gap” of professional project managers by encouraging talent, which in the future will determine the satisfaction of the demand of the labor markets with professional staff. According to the results of the survey, it was determined that from 2010 to 2020, 12 % growth in demand of professional project managers on the labor market and the result of it would be the creation of about 6.2 million workplaces by 2020, but the actual results exceeded to the original prediction and it reached to 66 million workplaces (This increase in demand coincided with a 37% increase in gross domestic product (GDP). An increase in demand for workplaces was due to the development of business services and sphere of production (in the future, healthcare), named as project industries.

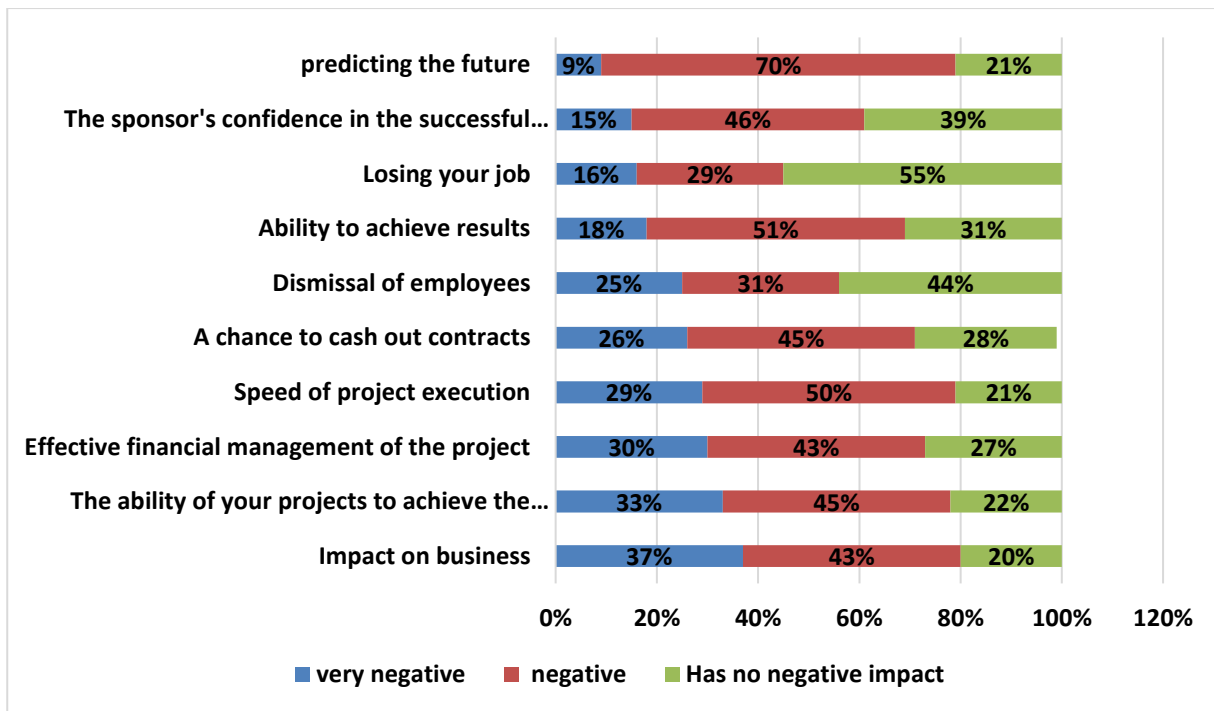
On the field of project management [13]. In 2020 (May) The survey was conducted by Project Management Institute, PMI and Project Business Foundation, PBF, in which 254 project managers, operating in Europe and North America, participated. According to the interviewed project managers, the Covid pandemic has had a strongly negative and negative impact on the business (37%-strongly negative (SN), 43%-negative impact (NI)), on achieving the set goal of the project (33 % - SN, 45 % - NI), on effective management of project finances – (30% - SN and 43% - NI), speed of project execution (29 % - SN and 50 % - NI), on signing the contracts (26% - SN and 45% - NI), on possibility to achieve the results (51 % - SN), on predicting the future (70% - SN). The reasons for strongly negative and negative impact of COVID on business are long-term restrictions, imposed regulations, reduction of consumers` demand due to low level of their purchasing power and other undetermined factors. COVID pandemic did not have a negative impact on: job loss (55%), dismissal of the employees (44%), on successful completion of the project (39%), which was caused by conducting the work process in remote mode or, if necessary, in hybrid mode (Fig. 3).

It should also be noted that various organizations operating in an unstable, uncertain, unclear (called a VUCA world) work environment under the pandemic conditions, countries have gone through four stages of responding to the impact of the pandemic in the field of project management, in particular: the first stage – it was evaluated as the “reaction” between the project team and project stakeholders (interested persons in project). Rapid and large-scale transition to remote team work caused a significant delay in ongoing projects and programs, what required to make sudden changes in project management methods, update the processes, some projects required to make a significant amendments in working methods.

The second stage – “Sustainability” took into account the restoration of the violated activity and introduction of the model of sustainable implementation of the project. In order to adapt to the remote or hybrid mode of work, during project management, the content of the project and the ways of responding to changes on the external environment were re-evaluated.

The third stage – “restoration” means to adapt the projects to updated management methods and business models. By developing new methods of management, project managers were able to manage the projects sustainably and deliver the final result to the client on time.

The fourth stage - "new reality" envisages the development of a long-term strategy for the development of the company.



**Fig. 3. Negative level of impact of Covid-19 on named components**

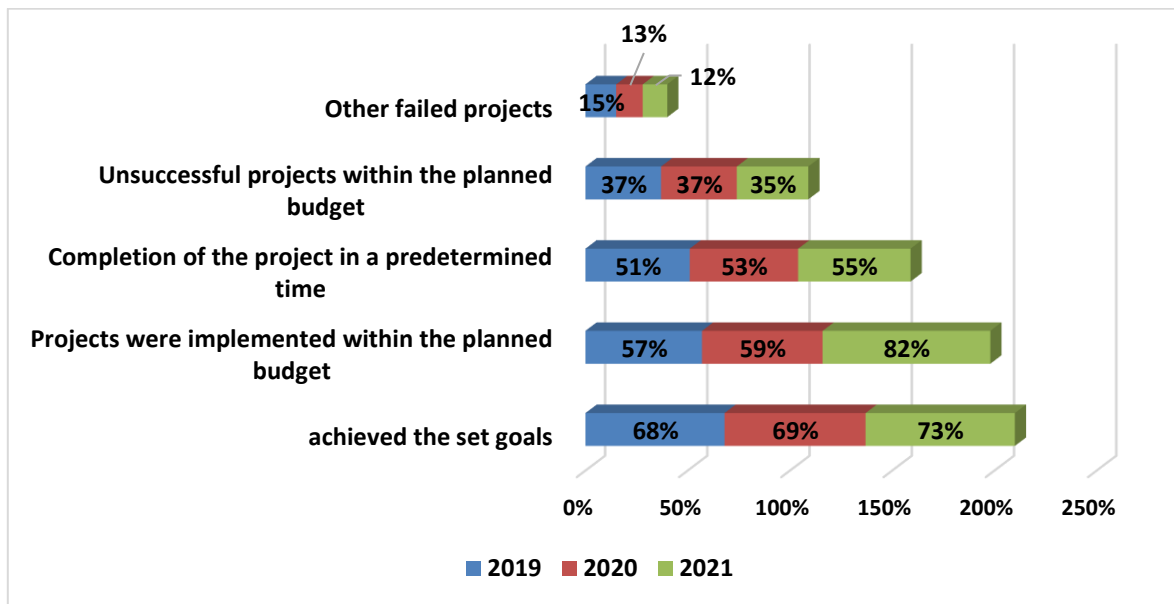
Source: *Project Management Institute & Project Business Foundation (2020). The Impact of the COVID-19 Crisis on Project Business: Cooperative Survey of Project Management Institute (PMI®) and the Project Business Foundation. PMI White Papers.*

According to the Global professional survey of “*Project Management Institute’s Pulse of the Profession®*” of 2019-2020 [16], the expected results of ongoing projects were evaluated negatively (Fig. 4). While by analyzing the results of the PMI 2021 “*Pulse of the Profession®*” survey (30% of the interviewed professional managers worked in a "traditional" working type of company, 32% worked in a "flexible" working type of company, 38% - in a company operating with a combined "flexible" and "traditional" management method), a number of companies implementing business projects were able to not only survive, but even develop by reacting to the Covid. 68 % of the interviewed project companies achieved the set goal in 2019, 69 % - in 2020, 73 % - in 2021; Projects were implemented within the planned budget in 2019–57 %, 59 % - in 2020, 62 % - in 2021; 51 % was possible to complete the project within the predetermined time in 2019, 53 % - in 2020, 55 % - in 2021; Within the planned budget, there were unsuccessful projects –37 % in 2019, 37 % - in 2020, 35 % - in 2021; 15 % is considered as other failed projects in 2019, 13 % - in 2020, 12 % - in 2021.

The companies, operating with "flexible" and combined management methods, improved project results while maintaining stability indicators unlike the companies operating with "traditional" management methods: with a high level of flexibility and maneuverability of teams; by creating an environment suitable for multifaceted development of employees, with Agile transformation or flexible, rapid act or action, with cloud technology, artificial intelligence, 5G mobile internet; with complex problem-solving techniques, microlearning apps and career assessment tools [16].

Practice shows that effective project management is impossible without mixing the active elements of traditional and common management methods, this can be based on the research conducted by HBR all over the world. Based on surveys and studies conducted with managers, it was determined that at present, success-

ful project management is able by combining the main distinguishing features together between traditional and modern managerial approaches (seven approaches).



**Fig. 4. Proect Exrcution/Delivery**

Source: *www.pmi.org* (2021).

Thus, a professional project manager:

1) in order to achieve career success in accordance with the traditional approach, one should have deep knowledge of the field and according to the modern approach, one should acquire technical knowledge for effective management of digital transformations;

2) For the purpose of constantly adaptation of changeable situations, decisions should be made in accordance with the traditional approach by being confidence and following the consistency and according to the modern approach, by taking quick actions based on the information received. If a manager does not keep a balance between these two approaches, he will either be very strict or very hesitant;

3) In order to correctly define the purpose of the project, a business plan should be developed in accordance with the traditional approach, and according to the modern approach, the "essence" and "vision" of the project should accurately be formed, for which a business plan is not necessary. Otherwise, the manager will go beyond reality;

4) In accordance with the traditional approach, in order to receive important information from employees, or use their knowledge properly - it is necessary to indicate to employees how to perform the function assigned to them, and according to the modern approach, the "team" principle must be used and decision should be made based on what is heard and listened;

5) In accordance with the traditional approach, for the purpose of maintaining the authority among employees and prospective employees – a manager should have the ability to make independent decisions and actions, and in accordance with the modern approach, he should take care of the training and retraining of employees, on their motivation;

6) According to the traditional approach, in order not to make biased or outdated decisions, intuitive decision should be made based on his own knowledge and according to the modern approach, decisions should be made based on the data;

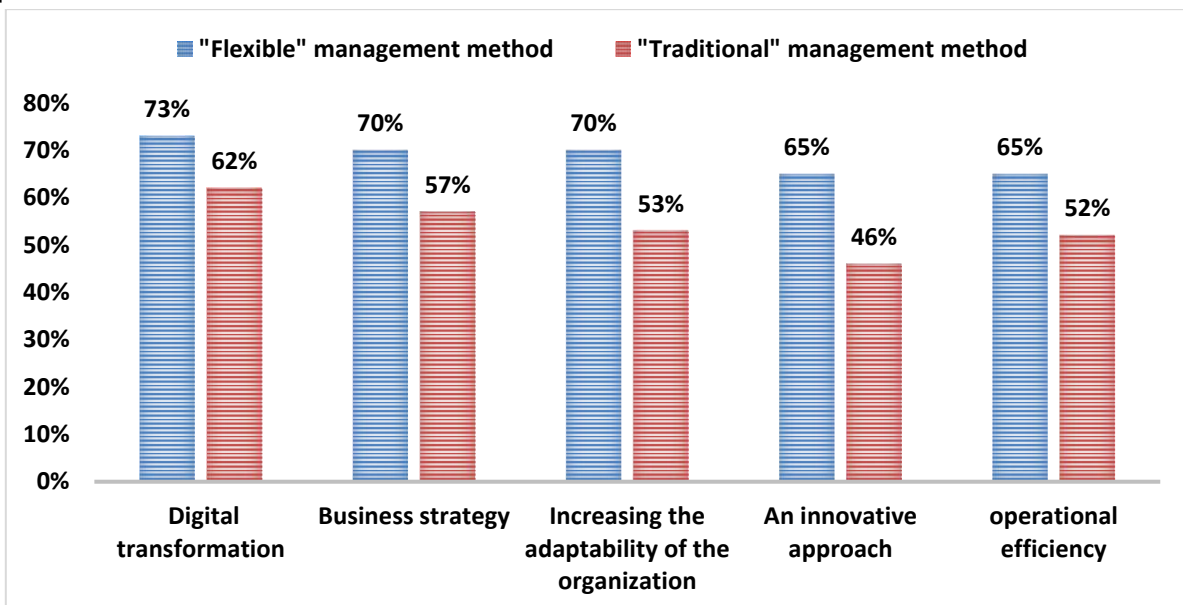
7) According to the traditional approach, in order not to refuse for the implementation of the project due to fear of imperfection, a lot of time should be spent on the creation of the product and according to the modern approach, it is important to create the product quickly.

These differences are often a source of confusion and stress for managers as they do not know which skills, competencies or behaviors to use in a particular situation.

Based on the study of manager's skills, it was determined that traditional skills help modern managers to form a balanced strategy, and the main role in the realization of these skills is played by the innate talents and abilities of a person.

According to the conclusions of scientific researchers and practitioners interested in business project management, the world changed as a result of the pandemic and managers working in the field of project management will never return to the situation before the pandemic and including pre-existing project management practice. In this unprecedented era, pace and scale of digital development has been accelerated in business activity according to project managers, what requires from the professional project managers and from the entities participating in the project: traditional, digital, technological and transformational skills.

In contrast to “traditional” approach, the companies operating with the "flexible" management method make changes in the digital transformation-73 % (traditional –62%); in business strategy –70 % (traditional – 57 %), increasing the adaptability of the organization –70 % (traditional –53 %) innovative approach –65 % (traditional-46 %), operational efficiency-65% (traditional –52 %) and in terms of other components (Fig 5.) [16].



**Fig. 5. The biggest changes in organizations caused by the pandemic**

Source: [www.pmi.org](http://www.pmi.org) (2021).

Scientist-practitioners, interested in methodological issues of project management, except of “fast” and “traditional” methods recognizes such methods of project management as they’re: during the "waterfall" management method, priority is given to the creation of project groups, allocation of the specific tasks among them and sequential implementation. A significant preference in "Critical Chain"

project management method is given to be determined the purpose, goals of the project by the project manager and created project working team.

During the “PERT” management method, in order to achieve the goal of the project, the time required for the implementation of each task is clearly determined. "Rational Unified Process" (RUP) management method is closely related to the "PERT" management method, which envisages that in order to achieve the goal of the project, the persons participating in the project (project manager, team, project leader) should be able to consider customers` requirements by establishing feedback with them together with the client.

“Critical path” management method is also closely related with the "PERT" method of project management, which means the implementation of each defined case step-by-step. Tasks, which are implemented



at all phases of project management (preparation, planning, implementation and completion) should be closely interdependent.

While using the “extreme” project management method, project manager and team gives preference to the life cycle of the project: evaluating and analyzing the results obtained during the implementation of the planned tasks at the pre-investment, investment and realization phases. The abovementioned method is used to satisfy the client’s interests as well.

“Six Sigma” management method is based on three main components, in particular: the first component is – DMAIC: define, measure, analyze, improve, control. The second component is – DMADV: define, evaluate, analyze, design and verify; The third component is IDOV: (identify, design, optimize, verify). The consistent practical implementation of each component leads the project to the desired goal.

Project management method “Crystal” aims to optimally use the talents and abilities of those individuals, who work on the implementation of the project. Emphasis is placed on a high level of communication between employees.

Project management method of the "Joint Application Development" (JAD) allows the client, target team to be involved in making decisions from the early stages of project management. Such involvement is based on a meeting between the project team and clients, where there is a discussion of the result that the working team gets as a result of the implementation of each phase and gives the customer the opportunity for feedback.

A specific research has not been conducted on how the project manager uses the above-named methods of project management separately. It should also be noted that, the specific names of the project management methods are not known for so called project managers. Even though, during the implementation of the project with project team/teams, by realizing the managerial talents and abilities with other persons participating in project, they are really able to realize the key elements of project management methods, unknown to them to achieve the goal of the project and satisfy the requirements of the client and customers.

In today's rapidly changing world, in an active and tough competitive market environment, the expectation of business project implementation is still increasing to meet the growing demands of customers, what increases the demand of modern high-paying professions on labor market even more. According to the experts` opinion in statistics, published by the US Bureau of Labor Statistics in 2019, the most popular and highly paid professions by 2026 are named: there will be 54,400 new workplaces in the position of information technology system analyst, average annual salary will be – 88 270 Dollars; There will be 75 800 new jobs for a manager of workshop brigade, whose average annual salary will be – 64 070 Dollars; there will be 47 100 new workplaces for programmers and average annual salary will be – 107 600 Dollars; 44 200 new jobs will be for information system manager, whose average annual salary will be – 139 220 Dollars; 115 200 new workplaces will be for manager-analysts and annual average salary will be – 82 450 Dollars [23].

According to the PMI survey, IT Project Management is one of the most in-demand profession in the digital age (33%). According to Emsi Burning Glass, the skills of project management is the only factor, what is looked for by the employers of IT in staff. By analyzing the data from a survey of professional representatives of IT/IS industry by the Project Management Institute, it was determined that only 6 % of project managers remained unemployed due to the COVID-19 pandemic and 20% did not even feel the negative impact of the pandemic.

By analyzing the requirements for the position of project manager (PM) published on Georgian employment web-site- <https://www.jobs.ge>, the demand is for: IT project managers, business process analyst-IT project manager, Agile project manager. The average monthly salary of IT project managers in Georgia is 5000 GEL. According to Salaryexpert.com, the average annual salary of entry level IT project manager (with 1-3 years of experience) is GEL 51 160. This rate reaches GEL 91 608 for a senior project manager (8+years of experience).

By the results of a survey of 500 companies and public sector agencies in Germany, it has been determined that in parallel with the demand for specialists with basic digital skills, in the next few years (in a rapidly changing time and space), the most important attention will be paid to the following individual skills for fast and effective work in companies: virtual collaboration, emotional intelligence management, resilience and adaptability, time, financial, human resource management, critical thinking, skills of delegation of tasks and data analysis.

86% of project managers prefer to introduce a culture of remote and hybrid communication in the company, which requires the development of virtual collaboration skills among managers. Through the remote communication, a manager acquaints the instructions to the members of the project team in a brief, clear and complete way to carry out the specific goals and objectives, team members will carry out the functions, imposed on them, in an organized, high-responsibility manner within a predetermined time interval. According to the results of the survey, 66% of the interviewed companies are preparing an office environment for hybrid work, 53% of employees are willing to continue working remotely and 47% want to return to their old work environment and also work remotely based on their needs.

In the corporate world, about 60% of job performance is achieved through emotional intelligence skills (EQ). 90% of professional project managers owes EQ, which means realizing not only the ability of internal motivation, self-awareness and self-regulation, but also the ability to effectively deal with negative emotions by motivating team members, cooperation, empathy.

Under the rapidly changing post-Covid conditions, 69% of the persons responsible for the final result of business projects - project managers - prefer "great durability and the ability to quickly adapt to changes". Development of the abovementioned skill in managers forms the ability of sustainability and adaptability towards the challenges.

Under the conditions of market economy, the phrase "time is money" is often used, which envisages effective management of two most important resources in project management: time and financial resources with software - DeskTime, which is preferred by 75% of project managers.

Before solving the existing and expecting problems during the "preparation", "planning", "implementation" and "completion" phases of project management, manager is required to analyze (by asking questions, logical reasoning, diversity of thought, cooperation and others) the prospect of the project, existing and expected problems, take into consideration the interests of all interested parties and so on. 68% of managers prefer the ability of critical thinking to make the right decisions, which should be realized in the daily working process of project management.

The most important function of the project manager is to carry out effective delegation of tasks among the persons participating in the project. Teamwork practices show that, the more responsibility and authority is given to the team members by the project managers, the more they try to develop the work environment and gain trust. According to the managers' assessment, the team with high trust shows up to 76% more engagement and 50 % shows more productivity.

Nowadays, one of the essential skills of a manager for successful project management is the ability to analyze quickly retrieved/obtained data, which increases the capabilities of the company.

Thus, the development of the modern business world is more oriented on the skills of manager than ever before, because employers consider these skills as an intellectual resource, an important factor for the company's development and competitiveness.

It should also be noted that the main goal of project companies operating in today's competitive space is to employ professional project managers in the company and begin to take care of the development of other new skills in project managers, what even more increases the capabilities of the company and gives preference.

## CONCLUSIONS

Studying the problems during the process of business project management around the world, including Georgia, gave us a significant preference to analyze the characteristics of business projects management before, during and post-COVID-19 period.

In order to follow the state regulations under the conditions of Covid pandemic in 2020, the companies, existing in paralyzed world, including Georgia, have changed communication channels, principles and methods of company management to adapt to difficulties for the implementation of business projects and business processes, for effective projects management, the emphasis was placed on the combination of "traditional" or "cascade" (waterfall) and "flexible" (Agile) management methods of business project management. 774 companies were participated in the survey, conducted by council of investors and EBRD. 5 % of the respondents were the managers of the large companies. According to the results of the survey, it was determined that, 33 % of the large companies switched to the online mode of work, 61 % of employees worked remotely – from home. 50 % of the companies did not release their employees or send them on unpaid leave either, what was caused by the need of employees in the working process. In 2020 the income was reduced with 50 % compared with 2019, what was caused by the reduction of customers` demands due to the low level of their purchasing power, or even the uncertainty of the future.

The difficulties, appeared during the Covid pandemic process, significantly highlighted the problems, existing in project management before the Covid pandemic. As a result of the study, it was determined that the main reasons for the failure of business projects are related to such emotional competencies of the manager as: inability to adapt to rapidly changing situations and changes (33 %), inability to work in a team (15%), inability to manage emotions and stress in the working process (20 %), bad interpersonal skills (32%) and others.

In the post-Covid period, 46% of companies' employees continues to work in a hybrid environment, where there is more choice about where, when and how much work needs to be done. The diversity of the work process has increased the demand for: the staff, having traditional, digital, technological and transformational skills.

The preference was given to the project managers, who have the ability to make decisions to solve the problems in the mode of changes, generated as a result of the influence of internal and external factors; the ability to manage emotions and stress; The ability to quickly evaluate and analyze data and information. The ability of effective resource management; they are distinguished by endurance, creativity and other skills.

Effectiveness of business project management with modern methodology provides for the practical realization of the advantages of the new method of project management formed as a result of combination of the main elements of "waterfall" and "Agile" management methods.

Throughout the years, the field of research and interests of Georgian and foreign scientists-practitioners is which method of project management is more actively used by various business sector. This is due to the fact that in practice there are no two identical projects (even when the same functions are distributed between project participants) and it is logical that there is no single approach to project management.

Practice makes it clear that the selection of project management methodology should be done in accordance with various industries, in compliance with different types of project team and organizational goals. It should also be noted that, what works in the best way for one type of team, can be incompatible for the other team. For instance, a lot of software developers began to discover that traditional methods of the project management hindered – rather than assisted – their working process and have a negative effect on their performance and consequences. As a result of it, software teams began to develop a new type of project management methodology designed to solve their specific problems. Therefore, project managers began to form new methods of project management in accordance with the sectoral field and form teams accordingly.

When choosing the right project management method, companies use many factors that influence which project management methodology is right for the project team and company. In order to make a decision, they shall carry out a quick review of such important issues as follows: determining the cost of the project and

budget planning; determining the number of team members; ability to manage risks; defining the flexibility of the project; determining the deadlines; Determining the need and necessity of collaboration with clients and stakeholders.

It should also be noted that, leading economists and project management experts have worked out effective methods of project management: "agile" or "fast", "traditional", "waterfall", "critical path", "PERT", "Rational Unified Process" (RUP), "critical chain", "extreme", "Scrum", "six sigma", "critical way", "development of a joint application" methods, which are advisable to be used in practice in a combined form during the implementation of the project in a specific branch or field.

As a result of the study, conducted by us, it was determined that 85 % of interviewed project managers did not know the mentioned methods of project management, but they practically use these methods in accordance with their managerial skills to successfully implement the project and move it into the business process.

Nowadays, the person responsible for the project - the professional project manager - has been named as the determining factor of the effectiveness of project management since ancient times, the number of whom has been evaluated by international studies as a "gap of professional project managers" in the pre-Covid pandemic period and in the post-Covid period as well.

The German Handelsblatt in the report on STEM Reporting (German: MINT-Reporting) of November 2021, submitted the results of a study conducted after the COVID-pandemic, according to it, the world lost more than 275,000 experienced professional project managers due to COVID-19, what led to the lack of experts [24].

At present, meeting the new challenges of the world for the future creates an "enormous gap of problems" during the project management process due to the lack of professional project managers.

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## PROSPECTS FOR THE DEVELOPMENT OF ECONOMIC TOURISM OF THE BLACK SEA REGION OF UKRAINE IN CONDITIONS OF POPULARIZATION OF ORGANIC PRODUCTION

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### **ABSTRACT**

*The transformation of the national economy towards increasing the specific gravity of the tourism industry is determined by the priority task of forming a paradigm of sustainable nature management, which should be based on an awareness of the complexity and versatility of global environmental and economic problems. The peculiarity of the national economy of Ukraine is defined, which was the growth of the specific weight of agricultural production in the structure. In view of this, it has been possible to determine the possibility of using the potential of the agricultural sector for the development of the tourism industry. The possibilities of obtaining mutual benefit from the interaction of agriculture and tourism are determined. The focus on organic production has been reasoned. It is noted on the formation of the consumer of a new generation, which is oriented on steel principles of existence and had a new philosophy of worldview. The development of organic forms of agriculture has strengthened the level of environmental safety of Ukraine, which contributed to the growth of the quality of life of the population and the transition to sustainable land use, which today was a prerequisite for the existence of humanity. It has been established that organic production is a multifunctional model of management, which functions on the basis of sustainable development, is distinguished by a unique management system based on scientific approaches with the preservation of the identity of national culture and directs the public perception of organic production by an intellectual activity. The conducted studies have provided opportunities to determine organic production as an effective direction of environmental entrepreneurship, which contributed to the growth of both environmental safety and national security of Ukraine as a whole. In this context, the search for such types of tourism that minimize the ecological burden on the territory has become relevant, which focused on a combination of regional features of the production industries and specialization of tourism enterprises. In particular, the Black Sea region of Ukraine, in addition to marine tourism, has the potential to develop the economic tourism industry, which will become an additional source of income for organic enterprises, and will also allow a separate service network to be formed.*

**Keywords:** *agricultural production, sustainable development, organic production, tourism, economic tourism, tourist product*

### **INTRODUCTION**

The growth of income of the population of the developed countries of the world and the increase in the cultural level of the citizens have contributed to the transformation of the structure of the world economy in the direction of the service component, strengthening the position of tourism industries in different countries of the world.

The role of tourism began to grow actively along with the increase in globalization, since it has been the flows of tourists that spread social, political and economic measures, crossing borders, transregional ties are implemented, social activity networks and authorities are expanded. The country's acquisition of the image of the tourist destination has gained concrete value, and the support of this image should be considered as a component of national interests and considered the defining direction of the international information policy of the world's states. The acquisition of strategic importance by tourism has determined its key factors in the socio-economic progress of the country [1, 2].

Scientific studies of the emergence and development of tourism prove its belonging to the socio-cultural environment, which evolves under the influence of the state, culture, science, economy. Today, the scientific search for the status of tourism in society has been relevant; the study of the impact of tourism development on the process of decentralization of power, the development of rural areas and the development of the united territorial community. In the context of public administration, tourism should be considered from the

position of axiology, which provides for the mandatory consideration of the spiritual, moral and humanitarian aspects of tourism measurement and its connection with the formation of ideals, norms and values [3, 4].

This subsystem has covered the development and justification of such priority aspects as value orientations of the tourist's personality; basic principles of self-development of the personality of the user of tourist services; the concept of a "service thinking" model of a tourism specialist; humanization and humanitarization of tourism activities; promising implementation of value priorities in the training of specialists for tourism and in the process of tourist activity. The praxeological component of tourism involves the design of the development of this industry within the united territorial communities on the basis of a program-targeted approach.

Evidence of the dynamic development of the tourism industry is the constant increase in its share in the global gross product, the volume of which today is 10%. Also, the global tourism industry employs almost 10% of the total number of employed people in the world, and the forecast indicators of the expected amount of income by the end of 2020 are 2000 billion dollars USA [4, 5]. Tourism is gaining special importance in the development of national economies of countries and becomes a driver of transformational conversions of their structures, stimulating the development of more than 50 related industries, in particular, the food and textile industry, transport, communications, trade, construction, etc.

Studies have proved that in Ukraine at the regional and local levels the potential for the development of the tourist and resort industry is concentrated, first of all, today Ukraine has ranked 78 in the rating of attractiveness for tourists, about 3.6 thousand enterprises that have been subjects of tourist activity are also registered, there were 1.5 thousand hotels and 3 thousand sanatorium and health facilities [5]. In this context, tourism should become the basis of long-term local economic development, but it should take into account the fact of sensitivity to changes in the domestic political and economic situation in the country, the state of international relations with neighboring countries, the vulnerability of territories to climatic factors and natural disasters. The main reason for the restrained development of the tourism industry in Ukraine has been the unsatisfactory state of historical and cultural heritage, transport infrastructure and communal services. Among the determining factors of development, the ecological condition of the territories, the level of pollution of water bodies and air should be highlighted. Therefore, the transition of the development of the tourism industry of Ukraine to the principles of sustainable development acquires relevance.

However, the uncontrolled growth of tourist flows has caused a number of environmental and cultural problems. Society and authorities drew attention to the problems of preserving natural, historical and cultural property. The principles of sustainable development have been chosen as the basis for the functioning of the tourism industry of advanced countries of the world, which were enshrined in 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro and approved in the program document "Agenda for the 21st Century," and the principles of sustainable tourism development were proposed by UNWTO (United Nations World Tourism Organization; UNWTO) [1, 6].

Now the concept of sustainable development has been the basis of a new paradigm of tourism, which had a socio-economic nature. In this context, we should talk about sustainable tourism, which includes ecological, green (rural) and farming, which is a branch of the national economy, the functioning of which is aimed at making a profit, meeting spiritual needs with the mandatory preservation of the natural resource potential of the territories.

The transformation of the national economy towards increasing the specific gravity of the tourism industry has been determined by the priority task of forming a paradigm of sustainable nature management, which should be based on an awareness of the complexity and versatility of global environmental and economic problems.

The development of the tourism industry of Ukraine has contributed to the implementation of the four Sustainable Development Goals for the period up to 2030, defined in 2015 at the United Nations summit, first of all, within the framework of the formation of measures to achieve the global goal 8 "Decent jobs and economic growth" by 2030, the industry is able to create new jobs and contribute to the development of local

culture. The goal of achieving the global goal of 11 "Cities and communities living in accordance with the principles of sustainable development" is to be achieved by developing and further implementing local development strategies for territorial communities, which will contribute to the balanced development of territories. Achieving the global goal of 12 "Responsible Consumption" is due to the development and implementation of a system for monitoring the impact of sustainable tourism on sustainable development. Tourism is one of the effective tools for achieving the global goal of 17 "Partnership for Goals," which is possible by creating a cooperation mechanism to solve regional environmental problems [1, 6, 7].

In general, there are the following principles of the concept of sustainable tourism and how to implement them: effective and economical use of resources; reducing excessive consumption and harmful emissions; conservation of natural and cultural heritage; strategic planning of tourism development; promoting tourism to support the local economy; attracting local communities; systematic approach to personnel training, tourism marketing, monitoring.

The formation of the paradigm of sustainable tourism has based on the perception of the fact that the ecological function of the biosphere is the basis of economic and social subsystems, since ecological capacity outlines the limits of a person's solving problems of an economic and social nature. Maintaining the throughput of the biosphere is a condition of ecological limitation, which requires the adoption of the principles of ethics in the process of interaction between man and nature. The first principle is the impossibility of causing damage arising from the perception of biological species and resources as carriers of a decisive role at any time in the development of humanity and nature. The second principle, the principle of non-interference, provides for the freedom of living organisms and ecosystems. It is important to focus on decency, based on the moral attitude to biological species and natural resources in general [4, 5].

The vast majority of environmental problems have associated with the absence or frequency of the principle of decency in the implementation of economic activities. Relation to natural resources, as a source of income, deprives future generations, and leaves them less and less chance of development. In this context, the world society must recognize the rights of nature with a clear limit of responsibility for their violation, which provides for compensation for the damage caused to nature by supporting ecosystems and landscapes [8-10].

The peculiarity of the national economy of Ukraine is the strengthening of agricultural production and the constant growth of its specific weight in the structure. In view of this, it is possible to determine the possibility of using the potential of the agricultural sector for the development of the tourism industry. There is an important question about the point of intersection of agricultural and tourist business, determining the possibility of obtaining mutual benefits from interaction. Studies have determined that it is necessary to pay attention to those areas of agricultural production that will be the most attractive for tourists. First of all, the production of organic products attracts attention.

The practice of developed countries of the world points to the effectiveness of environmental entrepreneurship as a component of the state regulation of economic mechanisms of nature management, which allows reorienting production in the direction of balanced nature use [11, 12], as the basis for increasing profitability. In this case, it acquires the development of environmental liability and environmental risks insurance, environmental audit, improvement of licensing and tax systems [1, 7].

Environmental entrepreneurship should include agricultural enterprises, which in the process of production activities prefer biologization. First of all, it involves the conduct of alternative agriculture for the production of organic products, which has designed to meet the needs of humanity in food, while preserving the fertility of soils for future generations. Alternative agriculture has the following varieties: ecological, biological, organic-biological, biodynamic, organic, integrated [13-15].

According to the Research Institute of Organic Agriculture (FiBL), 71.5 million hectares of agricultural land are occupied for organic production by the leadership of Australia (35.7 million hectares), Argentina (3.6 million hectares) and China (3.1 million hectares). The global organic market is 106 billion dollars. The average consumption of organic products per capita in Europe is 84 Euros per year, in particular, the largest



in Denmark - 344 Euros, Switzerland - 338 Euros. Ukraine is 0.5 Euros. Demand for organic products is growing mainly in developed countries for the leadership of Denmark, Switzerland, Sweden, Austria, Luxembourg [16].

In the structure of agricultural lands of Ukraine, the share of land under organic production in 2021 amounted to about 1% (422,299 hectares, including 370,110 thousand hectares with organic status), which corresponds to 20 place in the world and 12th in Europe. There have been 528 operators in the organic market in 2021 (89 less than in the previous year), 418 of which were agricultural producers certified according to standards equivalent to the organic legislation of the EU and NOP (USA). The domestic market of organic products of Ukraine has reached 25.1 million dollars USA including imported products. 73% of exports are oriented to European countries. In 2020, almost 9% of European organic products have been imported from Ukraine (80 items, 217.2 thousand tons and the amount of 116.7 million dollars USA), and in terms of imports in 2020, Ukraine ranked 4 among the 124 countries of the world. Evidence has shown the potential of the organic product market. The domestic market mainly consumes milk and dairy products, eggs, meat products, honey, ice cream, chocolate, also oil, flour, cereals, seeds, pasta, bakery products, vegetables and fruits, berries [16].

Research has shown an increase in demand for organic products both in the country and in the world as a whole. Promising in the development of organic production is the Black Sea region of Ukraine, primarily due to the regional uniqueness of agriculture in Odessa, Mykolaiv and Kherson regions. Developed areas of viticulture, horticulture, berry growing, vegetable growing and melons serve as a platform for the formation of a unique network of tourism using the potential of territories. In particular, the leader of the organic production industry in the south of Ukraine is the Kherson region, where 40 operators have worked in 2021, the area of land use under organic agriculture amounted to 61.667 thousand hectares (59.922 thousand hectares with organic status).

There are 37 such operators in the Odessa region, and the land area is 35.263 thousand hectares, including 34.354 thousand hectares with organic status. In Mykolaiv, organic production has carried out only by 22 operators, and the land area is 1,653 thousand hectares, of which 417 hectares have organic status [16].

The development of organic production confirms the formation of the consumer of a new generation, which is oriented on steel principles of existence and has a new philosophy of worldview. The development of organic forms of agriculture strengthens the level of environmental safety of Ukraine, which contributes to the growth of the quality of life of the population and the transition to sustainable land use, which today is a prerequisite for the existence of humanity. Organic production becomes the form of management that allows you to orient the manufacturer not only on the production of raw materials, but also to create a unique finished product that will achieve a high level of profitability. In turn, the development of this direction contributes to the development of territories, as it attracts investors and is the focus of international donors and grantees. The social importance of organic production is difficult to overestimate, because the attraction of additional labor resources reduces the unemployment rate and acts as a platform for cooperation.

The environmental friendliness of production performs an important educational function that forms a new type of consumer - an environmentally conscious consumer who has overcome the framework of quantitative consumption of values and switched to rational conscious choice of the necessary. Thus, production activity is already becoming a type of intellectual activity, which heralds the principles of sustainable development to future generations. Given the above, we can note that environmental education of producers and consumers should occur simultaneously, and the basic principles of the first order should be the profitability of management and the prestige of consumption, since it is these guidelines that preserve the nature of these processes. In this way, sustainable development goals can be achieved, designed to preserve the Earth for future generations.

Thus, organic production has been a multifunctional model of management, functioning on the basis of sustainable development, is distinguished by a unique management system based on scientific approaches

with the preservation of the identity of national culture and directed the public perception of organic production by an intellectual activity.

The conducted studies have provided opportunities to determine organic production as an effective direction of environmental entrepreneurship, which contributed to the growth of both environmental safety and national security of Ukraine as a whole. In this context, the search for such types of tourism that minimize the ecological burden on the territory becomes relevant, which focuses on a combination of regional features of the production industries and specialization of tourism enterprises. In particular, the Black Sea region of Ukraine, in addition to marine tourism, has the potential to develop the economic tourism industry, which will become an additional source of income for organic enterprises, and will also allow a separate service network to be formed.

The centers of this type of tourism can be enterprises that are engaged in the production of environmentally friendly food products due to the use of technologies aimed at the conservation and restoration of soils. Such types of agricultural production include: biodynamic agricultural production (Biodynamic Agriculture), ecological production (Ecological Farming), EM technologies (Efficient Microorganism Technologies), low-cost sustainable agriculture (LISA - Low Input Sustainable Agriculture) [16].

This vision can focus on biological production, which is common in Europe, is an independent form of alternative agricultural production, using organic fertilizers and non-toxic drugs [1]. Given the prospects for the development of tourism should pay attention to this type of production, which can also be called natural management. It has been started by M. Fukuoka, M. Okada (Japan). They used simple and affordable farming methods that hold the biological equilibrium of nature and are environmentally friendly. They believed that agriculture solved the following tasks: food improves human health, be profitable, maintain biological balance in nature.

It is this form of management that is attractive for tourism, which can be called household tourism, which will be aimed primarily at gaining practical experience in organic production at the household level, growing agricultural products, keeping and caring for animals, producing food products for their own consumption, and then recreation. The basis of the ideology of this type of tourism is the perception of itself as part of Nature and the alignment of its needs with its state. Thus, the provision of tourist services contributes to the formation of ecological thinking, which is the basis of the appropriate lifestyle.

In this case, it is necessary to note the importance of the producer of organic products, which carries out its activities on the principle of tolerance to nature in the course of agricultural production. Organic production enterprises have a wide range of opportunities for further development, since in the present environment environmental factors are of paramount importance in the formation of the economic state system.

The tourist direction of development of such enterprises is an effective means of popularizing organic products, expanding the circle of consumers in the domestic and foreign markets. Experience shows that farm tourism provides the farm with an additional 25% profit. The difference between farm tourism and economic one is that the farm uses tourism seasonally, and tourist services are a source of additional profit. The essence of our position is that economic tourism can become a separate activity of the enterprise, and the educational and upbringing nature of the tourist product gives it an active form and an all-season character. In this case, such tourist centers can be places of planned activities for agricultural producers, government institutions, educational institutions. In addition, this type of tourism can become widespread both among the rural and urban population, since the gained experience and the possibility of obtaining consultations can become the basis for conducting their own economy and the basis for starting their own business.

The following types of tourism related to the countryside and agricultural production have been defined: rural, green, farming. Their common feature has been a common species sign - the recreational nature of the tourist product. We also propose to distinguish economic tourism, similar to business tourism, which has designed to perform didactic, enlightening, cognitive, educational, permissive, commercial functions. A specific feature of the tourist product will be the cognitive nature of the tourist product. Mainly, these functions

in combination will meet the needs of their visitors, potential tourists will include active individuals who have a high level of environmental consciousness, have been interested in growing their own well-being and are ready to receive new knowledge and share experience. In accordance with the functions of the enterprise of the economic tourism industry, a tourist product will be obtained that will have the attributes of sustainable development.

Determining the presence of such attributes provides the opportunity to build a marketing strategy for the promotion of this type of tourist product. Note that the consumer will make his choice on the following sequence of motives: moral, rational and emotional. In this case, the proposed product should be aimed at obtaining knowledge, acquiring skills, developing personality qualities in the process of communication. Moral motives have been inherent in consumers of developed countries of the world, but the attributes of constancy attest to both rational motives, as well as emotional ones, satisfied with such qualities of a tourist product as prestige and fashionability. That is, a tourist product that has provided focused on a wide range of consumers with different income levels, but united by the idea of protecting the environment for future generations. In fact, the choice of goods in order to achieve sustainable development has been not always emotional, especially for an industrial tourist who almost always choosed environmentally friendly products and appropriate services rationally.

It is important to note that the proposal for the organization of economic tourism has concentrated on the organic producers who have been certified land intend to independently enter foreign markets and tried to form their own distribution network. In this case, economic tourism becomes a marketing tool that will provide additional profit. The organization of economic tourism can be cooperatives, attracting other farms and local population, local governments. Involving educational institutions in cooperation will solve the problem of attracting specialized specialists who will conduct training and training.

Observations of consumers in the markets of the city of Kherson have showed that a significant part of them asked questions to sellers about the environmental friendliness of food. Due to the fact that sellers of manufactured products act only as intermediaries on the market, they cannot provide convincing information to the consumer. Therefore, economic tourism has prospects among sellers of agricultural products. The weak development of tourism in rural areas has seen not only in the problems of infrastructure, but also in the specifics of living in rural areas. This is especially important for settlements of the steppe zone, where climatic conditions limit the period of tourist attractiveness. The advantage of the Black Sea region has been well-developed sea tourism, which is also determined by an additional factor in the development of economic tourism, which was the basis for the formation of an organic production enterprise.

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## **PECULIARITIES OF CORPORATE GOVERNANCE IN GEORGIA: CHALLENGES AND PERSPECTIVES**

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### **ABSTRACT**

*The scientific article studies important issues of economic theory and practice: the challenges and perspectives of corporate governance of Georgia. The article considers sections, such as Introduction, Materials and Methods, Outcomes and Judgment, Conclusion. The introduction describes the actuality of the topic and highlights the research problem. The material and methods provide an overview of the existing literature and methods related to the research subject. The results and judgment reflect the challenges of corporate governance and key areas for improvement. The conclusion of the article is presented detailed information on the current situation in the field of corporate governance of the state.*

**Keywords:** *Corporate governance, Information transparency, dividend policy, Stock Market.*

### **INTRODUCTION**

The good condition of the corporate governance system in any country is significantly determined by the traditions and existing practices of economic relations, as well as the role of the state in terms of economic development and regulation of the legal system despite the diversity of corporate governance models. Around the world, they can be divided into three main groups: Anglo-Saxon, German and Japanese models.

In Georgia, the logic of the formation of corporate governance in the 1990s was based on the massive import of the American stock market and other corporate governance models. At present, by the obligations under the EU-Georgia Association Agreement, the principles of corporate governance, corporate openness, and information transparency procedures are in line with EU approaches. Integration into the EU institutions and the Association Agreement further expanded the country's trade and transit opportunities (Shanava, 2021). Georgia is a convenient transport corridor for Europe and Asia, and its location plays an important transit role in the movement between Europe and Asia. So the country has a transit, connecting function.

In this regard, it is essential to develop logistics infrastructure and transit capabilities. In this regard, it is necessary to highlight the benefits of corporate governance in this process (Shanava, 2021).

The need to address the issue is growing significantly, as rational corporate governance of companies in the modern global world becomes the basis for their successful operation. In considering, it is important to intensify and develop scientific research on corporate governance issues, which will create a solid foundation in a market economy for improving/establishing a corporate governance culture in the country and as a result, investment attractiveness (Vanishvili et al., 2021).

The actuality of corporate governance conditioned the object, subject, aims, and objectives of the research.

The object of the research is the modern corporate governance culture of companies, operating in the country, as defined by law. The subject of the study is the condition of their openness and information transparency.

The purpose of the research is - to study the current situation of openness and information transparency of companies, operating in the non-financial sector of the country, identification of key problems and ways to solve them, as well as develop recommendations for improving the regulatory framework based on the analysis and practice of corporate governance theory.

## MATERIALS AND METHODS

Nowadays the directions of formation and improvement of corporate governance are widely discussed in the scientific economic literature. This is very important for both developed and developing countries, including Georgia. It is very important to promote a transparent business based on corporate governance to achieve accelerated economic development of the country.

In this regard, it is interesting to analyze foreign literary sources. The study of the presented problem is related to the guidelines and reports prepared by various international organizations, which are based on the experience of the states, the recommendations of business analysts, lawyers, and financiers, reflecting market problems.

Especially noteworthy are in the UK published reports about stages of development of corporate management. In this case, we should emphasize the Cadbury report, started in 1991 by the Finance Committee of Corporate Governance, chaired by Sir Adrian Cadbury. The need to set up a committee was dictated by the low level of investor confidence in the UK securities market and open joint-stock companies, which also led to the bankruptcy of two large companies, the Coloroll and Polly Pack consortium. In December 1992, the Corporate Governance Code (the so-called "Corporate Code") was drafted, based on Cadbury's proposals and recommendations. Later the issue of binding force was defined on the principle of "comply or explain" (The Cadbury Report, 1992).

Hampel's report is also important, published in January 1998. Its main purpose is to review the UK's corporate governance system and analyze the status of its achievements. The Hampel Report statement is that the main purpose of the business, regardless of the size of the company and its business value, is to protect and expand shareholder investment (The Hampel Report, 1998).

In terms of corporate governance one more important paper is the Higgs Report, whose working group reviews in detail the role of non-executive directors in corporate governance and also pays significant attention to the Audit Committee, which also aims to develop and strengthen the Combined Code. In this regard, the position of the head of the working group - Derek Higgs, was quite critical towards the effectiveness of the principle of "comply or explain" and considered it appropriate to limit the discretion granted by the Code and introduce a more binding norm.

In his opinion, corporate scandals would have been avoided if companies had been more accountable for their Code and Cadbury account requirements, especially if companies had provided transparency (Derek Higgs, 2003).

The Smith Report too is significant in the field of corporate governance, published in 2003, which emphasizes the importance of auditor independence. We must also acknowledge that the Smith Report shares the European Commission's approach to auditing policy. In particular, one of the issues addressed in it is the obligation of the auditor to verify for himself whether the corporate governance system of the company ensures its independence and ensures its impartiality (Sir Robert Smith, 2003).

The EU Green Papers set out common standards and rules, recommended for all corporations to create an effective corporate governance system, and ensure that each of them has an impact on the global economy, which are crucial to improving corporate governance and its information transparency.

For Georgia, the "Principles of Corporate Governance" created by the OECD in 1999, in terms of economic development is very relevant. This document forms new, already revised principles based on the vast experience of not only OECD members but also non-OECD countries. The OECD "Corporate Governance Principles" document is divided into two parts. Each section of this document is entitled one of the principles given in bold and italics (OECD, Principles of Corporate Governance, 1999).

The most important is the OECD report of 2009, which analyzes included in this system, principles of corporate governance for the future, and summarizes the main conclusions for identifying and overcoming the strengths of corporate governance in the countries. The report also covers the issue of remuneration of board members and the introduction of new forms of incentive system, as well as models of remuneration and opportunities for their transparency. The 2010 OECD report focuses: on increasing the role of

shareholders in corporate operations; overseeing risk management; transparent participation of institutional investors in voting; enhancing various shareholder contacts in companies, and encouraging cooperation with investors (OECD, Annual Report, 2009).

Risks of corporate governance are carefully reviewed in OECD reports. The report is based on the application of corporate risk management practices prepared by three OECD countries - Norway, Singapore, and Switzerland. Here, attention is focused on the practice of privatization of state-owned shares. This is a great example to use for Georgia in resolving corporate risk management problems.

There is one more work about corporate governance strategy - Harvard Business School Monograph on „Corporate Strategy“. This monograph is a collection of articles in which individual authors pay attention to the process of forming corporate advantages in the US, as well as analyze the competitive strategy based on resources in the 90s of the last century. The monograph highlights the evolution of the formation of corporate strategies for the modern world and formulates the strategies of the market economy of developing countries, and in line with the analysis of these strategies, there are established opportunities for companies to gain comparative advantages.

Georgian scientists-economists are also widely involved in the study of the issue of corporate governance, carried out in several directions:

1. Part of the scientists/economists discuss the principles of corporate governance and the main directions of perfection. So, for example, B. Bitsadze - in the monograph "Fundamentals of Corporate Management" - studies the place of the corporation in the economy of developed countries. In addition, the author proposes the principles of corporate governance. Someplace in the monograph is devoted to the study of corporate asset management and funding sources. In this regard, the main focus of the monograph is on solving the problems of formation and improvement of financial flows of corporate activities (Bitsadze, 2009).

The same aspect refers to the problem of corporate governance in the monograph - "Corporate Management", Lazviasvili. The author discusses the problems of corporate governance in Georgia and analyzes the functions of corporate governing bodies, the specifics of internal governance decision-making in corporations, the possibilities of corporate control and personnel management functions in corporations. In addition, the author focuses on corporate investment management and corporate dividend policy (Lazviashvili, 2013).

2. The second part of economists pays special attention to corporate finance management issues. So, for example, r. Kakulia in the paper - "Corporate Finance" - characterizes the theoretical-methodological basis of corporate finance and the development specifics of Georgia. In this case, the focus is - analyzing corporate finance sources and cash flows. The paper also discusses the factors affecting the creditworthiness of corporations (Kakulia et al., 2009).

Corporate finance management issues are written in the D. Gadelia's monograph - "Corporate Finance", focuses on the formation and development of corporate finance. Here the author discusses such important issues as the sources and specifics of corporate finance formation in Georgia, the place of financial accounting in corporate finance management, types and methods of financial control (Gadelia, 2006).

3. One of the important directions of the research of Georgian scientists/economists is to determine the development trends of corporate governance. In this regard, A. Svanidze in his article - "What is corporate governance" - focuses on the essence of corporate governance and its stages of development, the peculiarities of corporate governance in modern conditions and offers suggestions for the introduction of new forms of corporate governance in Georgian companies (Svanidze 2003, №1). Also, there is M. Vanishvili's article - "Transformation of Corporate Governance Information Transparency in Georgia", which describes the measures taken in the corporate governance information transparency line in Georgian companies and identifies directions for its further improvement.

4. Numerous papers are published on issues of legal regulation of corporate governance (Burduli, 2013). They focus on the issues of legislative regulation of corporate governance, the formation of governing structures in corporations, and the factors influencing their performance.

A brief review of the literature shows that each school or individual researcher makes a great contribution to the development of theoretical issues related to corporate governance. However, it is also clear that the study of corporate governance problems in the reviewed works is only theoretical-empirical. Therefore, our scientific article is dedicated to the analysis of challenges facing corporate governance and what are the priorities for overcoming them in corporations operating in Georgia.

The theoretical-methodological basis of the research is the existing provisions of corporate governance, classical and modern corporate governance theories, Georgian and foreign monographs on corporate governance issues, scientific publications in specialized journals. The instrumental-methodological part of research is represented by the combination of general methods of scientific cognition with such generally recognized methods as analysis and synthesis, historical and logical, generalization and abstraction, induction and deduction, analogy, and comparative analysis.

The empirical base of the research includes the following main sources: materials of international organizations; information-analytical materials of the Georgian National Statistics Office and other structures of the executive institutes, prepared by the Georgian Market Research Group; Results of an independent study by the authors.

## RESULTS AND DISCUSSION

The issue of corporate governance was raised by the stock market demands. Currently, there is no integrated accepted definition of "corporate governance". In the scientific literature, there are several acceptable definitions of this term.

The term "corporate governance" was first used in 1984 by Robert Yan (Bob) Tricker as a subject of his research, and he is the founder of this term. According to an explanation published in the Financial Times in 1997, "corporate governance", can be defined as the company's relationship with its shareholders, and in a broader sense - as its relationship with the public. In other words, "corporate governance" is a field of economics that examines how effective corporate governance is provided through incentives such as contracts and legislation"(Svanidze, 2003).

As a result, corporate governance can be interpreted as a set of rules, regulations, and processes that determine the vector of a company's activity and its success. Therefore, "Corporate governance is the system by which companies are managed, controlled and regulated by the relationship between the company's management, the board of directors, shareholders and other stakeholders" (Zhgenti, 2016).

The principles of corporate governance developed by OECD specialists in 2004, present the following unified indicators of corporate governance: (1) shareholder rights; (2) fair treatment of shareholders; (3) the role of stakeholders; (4) openness and information transparency; (5) Obligations of the Supervisory Board (Zhgenti, 2016).

Finally, it is possible to evaluate a corporate governance system using its national model. Among the important factors influencing the formation of such models are the following: the structure of share ownership; Specifics of the whole financial system; Ratio of funding sources; General macroeconomic situation and economic policy; History of the development of the political system and culture of the country; Established practice of economic relations; The dose of state intervention in the economy; The level of financial education of the population (Shanava & Vanishvili, 2021). Depending on the share of these factors, it is possible to develop a national corporate governance model and harmonize it with EU legislation.

Modern corporate governance is familiar with the three systems characterizing both Anglo-American and Romano-German law. There are single-stage, two-stage and mixed systems (Vanishvili & Sreseli, 2022).

A single-stage system of corporate governance is also known as a monistic or unitary system. This system was established and developed in the United States. The single-stage system is distinguished as two governing bodies. It is the General structure of Shareholders, which is the main governing body of the company and called the Board of Directors.



The Board of Directors is composed of two functionally separated members: 1. The board members, who represent the company for operations, and 2. The board members with supervisory and controlling powers, whose functions are to control the activities of the directors. The company also has independent members (directors), whose functions are to avoid: various conflicts of interest; control the board; they don't have financial and/or other legal relationship with the company and/or any of its subsidiaries.

Directors with representative functions are accountable to independent directors with control functions as well as to the general meeting of shareholders. Such dual accountability stems from the relationship between the general meeting of shareholders and the non-executive directors, as well as the specifics of the relationship between the executive and non-executive directors within the board of directors. For example, by the decision of the General Meeting of Shareholders, it is possible to elect any member of the Board and also to dismiss him. At the same time, non-executive directors can dismiss members from the position of CEO.

The purpose of functions classification of the members within the board is to avoid as much as possible the dishonesty of the CEO's activities, which may impact the shareholder's interests and the interests of the company as a whole. Control by non-executive directors reduces the likelihood of shareholder risk. Which would be caused by the inefficiency of internal corporate governance.

The so-called Non-insider status of non-executive directors provides more guarantees of objectivity, although there is a case when non-insider directors may be able to perform their functions objectively. Non-executive directors may also be held liable for such actions.

The two-stage system of corporate governance is also known as the dualistic system. The system originated and developed mainly in countries with continental law, and this system is formed from German legislation.

A dualistic system through completely independent governing bodies clearly separates the management and control functions of the company. This system represents the General Meeting of Shareholders, which consists of the Supervisory Board and the Board of Directors. This level of management is appointed for a certain period by the Supervisory Board. Hierarchically, the board of directors is accountable to the supervisory board and the general meeting of shareholders (Otinashvili & Vanishvili, 2020).

In this case, unlike the one-stage system, none of the members of the Board of Directors appears to be a controlling entity. This function has been delegated to the Supervisory Board. The Board of Directors is responsible for daily operations and represents the outworld of the company.

The function of the Supervisory Board is to control the Board of Directors, which has a kind of mediating role between the General Meeting of Shareholders and the Board of Directors. On the one hand, the supervisory board is responsible for the implementation of effective control, the analysis of significant transactions to be made by the company, and, on the other hand, it is fully accountable to shareholders for the specific results of the company's strategic management control.

The classic two-stage system of corporate governance precludes the existence of certain preconditions for the establishment of a supervisory board. Obviously, like a one-stage system, in this system, the supervisory board is staffed by non-insiders. Legislation may also allow the election of insiders to the supervisory board, but their number should not exceed the number of non-insiders. The reason for this can be explained by ensuring more impartial control of the Board of Directors.

A mixed, hybrid system of corporate governance is recognized by the laws of many countries. Under the mixed system, companies have the opportunity to form a board of directors with executive and non-executive functions typical of a one-stage system. At the same time, they can form a supervisory board and based on the founding document of the company can determine the possibility for any member of the board of directors to be a member of the supervisory board in parallel.

One of the important features of the hybrid system is the existence of several preconditions provided by law when the company is required to establish a supervisory board. In other cases, the decision to set up a su-

pervisory board depends on the will of the shareholders. However, in any case, the system under consideration defines the functions of the board of directors responsible for managing and representing the company.

In terms of international corporate governance practice, the OECD corporate governance system is based on the following four core principles: (1) fairness; (2) liability; (3) transparency; (4) Accountability (Corporate Governance handbook, 2010). In our opinion, these principles of OECD should be the basis for the development of a new corporate governance code of Georgia (Vanishvili & Lemonjava, 2017).

In Georgia, the logic of the formation of corporate governance in the 1990s was based on the massive import of the American stock market and other corporate governance models (Vanishvili & Lemonjava, 2016). And the following practical steps have been taken to implement this model:

- ▶ "Voucher" privatization - the forced transformation of former state-owned enterprises into open-type stock companies and distribution of their shares to a large number of small shareholders;
- ▶ Fast development of the stock market and its infrastructure (exchanges, brokers, depositors, and registrars);
- ▶ Formation of collective investment institutions (check and mutual investment funds, non-state pension funds).

The organizers of the reforms believed that the dispersal of shares among a large number of small shareholders would become a prerequisite for the high liquidity of the stock market. It also provided access to shares of privatized enterprises by external investors (through secondary market operations). Developing the stock market infrastructure would reduce transaction costs and allow small shareholders to vote in the event of their disagreement with the company's management policy. Investment institutions would be able to accumulate the shares of small shareholders and more effectively protect their interests by controlling the management of the respective enterprises.

But, in practice, the realization of this assumption became only partially possible. Intensive imports and dispersal of institutions in the field of corporate law within the framework of mass privatization made it impossible to neutralize the demand for the "insider" model of privatization. By the mid-1990s, managers of former state-owned enterprises in the corporate sector had already clearly noticed two trends: (1) concentration and control of ownership by acquiring 75% stakes; (2) Maximum closures of joint-stock companies and opacity of activities within the formation of a complex system of corporate control over large enterprises, through numerous affiliated firms and offshore companies.

Currently, the level of corporate governance in our country is hampered by the lack of information and financial resources, lack of sufficient interest from qualified specialists and governing bodies, low level of financial education of the population (Shanava & Vanishvili, 2021). A common problem is the non-disclosure of information by corporations. Mostly, companies do not publish annual reports and assessments, therefore information often is not available, including to small shareholders.

At the same time, from the 90s of the last century, Georgia began the formation of progressive corporate legislation. On October 28, 1994, the Law of Georgia on Entrepreneurs was adopted, which regulated the legal status and activities of entrepreneurial entities operating in the country in entrepreneurship. On December 24, 1998, the Law of Georgia on the Securities Market came into force. A stock exchange, independent securities registrars, a central depository, and the necessary infrastructure for the circulation of securities were established in the country. On June 25, 1996, the Law of Georgia on Bankruptcy Proceedings was adopted, amended in March 2007. Finally, the Law on Insolvency Proceedings was adopted, which allowed the judiciary to initiate bankruptcy proceedings.

It is noteworthy that the Corporate Governance Code has been in force for commercial banks in Georgia since 2009. This voluntary code obeys the "comply or explain" principle. Since its adoption, commercial banks have joined the Corporate Governance Code to help banks implement effective corporate governance mechanisms related to segregation of responsibilities, compelling conflict of interest, control and balancing policies, and other corporate governance issues.

According to the recommendations of this Code, all banks operating in Georgia take into account the essence of the norms established by the Code and prepare an annual corporate governance report. Such an account of each bank is in full compliance with the requirements of the Code, and in case of difference, the reasons why the bank did not comply with these requirements are explained. The Code recommends that each bank develop internal regulations on governing bodies, supervisory boards, and committees. Each statute shall include the structure, composition, powers, responsibilities, accountability, and any procedural matters relating to its functioning.

Thus, the current legal framework for corporate governance in Georgia needs to be improved and expanded, the implementation of which is a prospect for the near future. At present, can be singled out the following aspects characteristics for the formation of the Georgian model of corporate governance:

- The likelihood of external equity funding remains very low;
- The current state of Georgia's financial systems does not allow us to assess the possible propensity of Georgian corporate governance systems to classical models;
- The concentration of share capital is a visible process, in the framework of which not only the consolidation of control is carried out, but also the realization of the "self-sufficient" model of corporate governance by economic methods;
- Legal innovations (in the field of corporate law) have reached a significant level in terms of existing economic conditions;
- Methods of protecting the rights of shareholders can not find further development without taking adequate joint measures in the field of legal application.

As a result, given the empirical and legal data, today, we can talk about stable and fundamental contradictions in the emerging Georgian model of corporate governance. In this model, there are two fundamentally contradictory approaches: (1) the concentration of share capital, which provides for the minimum means of the legal protection of shareholders; (2) the Anglo-American legal tradition, by maximizing the means of the legal protection of its minority shareholders.

Combining these two approaches has led to a unique situation of mutual neutralization. On the one hand, the concentration of share capital and the gradual disappearance of small shareholders have diminished the importance of a broader legal instrument to protect minorities in the corporate sector as a whole; On the other hand, the creation of an extensive system of shareholder protection remedies inhibits the post-capital concentration process.

In corporations, the analysis of studies conducted at different times showed that in the period under review, the share of one large shareholder in Georgian companies varies between 32-36%, and the share of three large shareholders - in the range of 41-47%. Here, surveys have shown that among the three largest shareholders, board members were named in 74.6% of cases and locals (excluding board members) in 56.6% of cases. In terms of ownership of the controlling stake among the three largest shareholders, the members of the Board of Directors were those who were most often named among the largest shareholders (36.1%), the members of the Supervisory Board came in second (30.6%). From this, it can be assumed that under current corporate law (acquisition terms) the average concentration has reached the formal limit.

With a more optimistic interpretation, we can say that today, in Georgia, between the level of concentration and certain measures of protection of the interests of small shareholders has been achieved a kind of "model" balance. The element of optimism lies in the fact that the system has stabilized somewhat, however, most of the controlling shareholders act in the same way as the CEO, and the representative of the Supervisory Board as well. Even in companies where ownership and control are separate, often it is only presented on paper. In such companies, we face weak structures of accountability and control, weak mechanisms of disclosure of information. Main business groups in the country such as holding companies control the majority companies in most industries. While holding structures can serve legal purposes, complex business structures, cross-shareholding, pyramid schemes, and other mechanisms can create a vague ownership system, making companies difficult to understand for shareholders and investors.

In Georgia, in the corporate governance system, we often face inexperienced and inadequate corporate bodies. The institutions of the Supervisory Board and the Executive Board were defined by law in 1994, but in March 2008, a significant amendment was made to the Law of Georgia on Entrepreneurs. A supervisory board has become mandatory in only a few cases, while in other cases, the establishment of supervisory boards is a company decision. Unfortunately, strong, viable and independent corporate bodies are rarely found in the Georgian economy (Vanishvili et al., 2020).

In Georgia, in order to establish the principles of corporate governance, it is necessary to develop / adopt a corporate governance code for companies, which is an application for corporate governance of companies. It should aim to make the management structure more transparent. With the introduction and systematic updating of the Corporate Governance Code, the country is making a statement that demonstrates its desire to demonstratively lead and establish a corporate governance model practice.

Due to the existing business relations in Georgia, when there are not even corporate governance principles, it is difficult to judge the so-called "soft law". At the initial stage, we consider it justified to develop documents of a recommendatory nature, which, as a result of practical application, will allow us to refine and improve the relevant legal framework.

The Georgian securities market has been in a difficult situation for the last decade. This was mainly due to the radical changes in the Georgian Law on the Securities Market and the Law on Entrepreneurs, which led to a reduction in the transparency of securities trading on the stock exchange and, consequently, to the number of companies required to report publicly.

It is noteworthy that changing the definition of "reporting enterprise" in the Law of Georgia "On the Securities Market," the number of companies required to submit public reports was reduced. As a result, the situation with transparency has deteriorated significantly.

Due to the amendments to the Law on the Securities Market, the transparency of the country's joint-stock companies is regressing instead of progressing. Of the 675 active joint-stock companies in 2017, only 258 were "accountable enterprises". Of this number, only 51 enterprises submitted annual and periodic reports. All of the above negatively affected the interest of investors.

The situation in the country was aggravated by the fact that the financial situation of Georgian joint-stock companies was unknown. In Georgia, unlike neighboring countries, joint-stock companies are not required to disclose general financial information publicly. Our established practice has failed to provide pricing information to potential buyers or sellers. Large issuers operating in Georgia would attract most of the capital from foreign markets, bypassing the local market.

Adaptation to EU legislation has become the main motivator of the legal framework of the Georgian securities market. At present, the securities market is being harmonized with the EU positions and approaches by the obligations under the EU-Georgia Association Agreement. This presupposes the inclusion of the content of 22 directives and regulations in the current Law on the Securities Market.

In this regard, we consider the best option to implement the legislative changes in the Georgian capital market in two stages. At the initial stage, all legislative changes should be prepared and brought closer to the EU legal framework, and at the second stage, the remaining legislative improvement work should be carried out.

To minimize corporate governance problems in Georgia, based on the experience of corporate governance in the EU member states, it is necessary to develop a corporate governance code for the Georgian entrepreneurial sector. Enactment of this Code will ensure the proper functioning of governing bodies in joint-stock companies, proper redistribution of rights and responsibilities among governing bodies, strengthening internal control over the activities of companies, increasing the efficiency of operations, increasing the reliability of financial statements, resolving conflicts of interest in companies.

Thus, as a result of the analysis of the current legal framework in Georgia, it may be concluded that in order to improve corporate governance in our country, it is necessary to develop a new corporate governance

code for the entrepreneurial sector. And other legislative acts, which will make it possible to meet modern standards of corporate governance openness and information transparency.

One of the key directions in improving corporate governance is to increase openness and degree of information transparency. According to the principles of OECD corporate governance, openness and transparency of information mean timely and accurate disclosure of information on all essential issues related to the company's financial condition, results of operations, ownership, and management of the company.

The principle of information transparency is also required for non-financial activities, which requires the publication of the company normative documents. In addition, information dissemination channels should ensure equal and timely access to information for users at a low cost.

Information transparency ensures the investor's interest to have a correct idea of the condition of corporate governance. The quality of corporate governance reduces subjectivity in decision-making. This principle underlies the rating of the international agency Standard & Poor's.

If the company becomes more transparent, investors have the opportunity to create a more complete picture of the company's commercial and financial performance. Even if the information disclosed by the company is negative, shareholders remain winners as the risk of uncertainty for them is reduced.

Most of the existing methods of determining corporate governance ratings are closed, i.e., the investor is unable to assess the importance of all analytical parameters in corporate governance ratings. At the same time, the use of these methods, at the present stage, does not fully reflect the realities of beginner Georgian corporate governance. Therefore, based on the mentioned methodologies, the need to model an acceptable version to be used in the conditions of Georgia, which will be adapted to the specifics of the country's corporate governance, was identified (Vanishvili & Katsadze, 2021).

Given that shareholders and investors need accessible, regular and reliable information about the corporation's activities, without which it is impossible to make investment decisions, the corporate governance rating option we have developed is characterized by the following features:

- ▶ The selection of essential features of corporate governance information transparency is carried out taking into account the content of national legislation;
- ▶ Information is collected remotely and to collect this information could be used real public source;
- ▶ The information transparency risks of corporate governance of research companies (joint stock companies) are assessed through scores;
- ▶ The rating procedure is based on an analysis of the actual risks of corporate governance openness and information transparency. For each of them, points are awarded according to defined rules.

When there is no information transparency in corporate governance, scores are calculated through expert evaluation. If the state owns a certain number of shares of the joint-stock company, it is necessary to invite governmental experts from the competent employees of the relevant sectoral ministry and agency, or the body supervising the circulation of securities. In all other cases, could be invited relevant specialists as experts.

For information transparency assessment, the score calculation system is shown below, which corresponds to the rank of the object to be evaluated:

score	2	5	10	14
rank	1	2	3	4

Using these values, the final overall rating is determined by the sum of points: If the rating score is higher, the risk of investing in this company also is higher. Consequently, the cost of invested capital is rising. Thus, the risk value can vary from 100 points (the highest degree of corporate governance risk) to 0 points (no risk).

The information openness rating of Georgia's corporate governance on the rating scale looks like: Carrier with low investment risk - up to 28 points; Average bearer of investment risk - from 29 to 74 points; The bearer of high investment risk - 75 and above points.

As mentioned above, in our version of the methodology for assessing the rating of information transparency of corporate governance, the choice of essential features (risks) of information transparency is formalized: the procedure for building a rating is open from beginning to end; Companies are analyzed by individuals (experts) who have no contact with the securities market; Obtaining analytical information is provided remotely; The analysis of companies is carried out independently of the management. The assignment of rating points is also not agreed with the research company. Accounting for these factors generally provides a more complete and objective assessment of the information openness and transparency of corporate governance in national companies.

### **CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH**

Analyzing and researching the problems and prospects of corporate governance in Georgia, we can come to the following main conclusions:

1. In the modern world, are observed the following main trends in improving the corporate governance system: increased requirements for openness and information transparency in joint-stock companies; Strengthening shareholder control over government bodies; Increasing the transparency of issuers and clarifying requirements for them; Improving legislation to protect the rights of minority shareholders; Tighten changes in the rules for issuing shares and authorized capital.

2. It can be singled out the following aspects, typical for the formation of the Georgian corporate governance model: the likelihood of external equity financing remains very low; The current state of the Georgian financial system does not allow us to assess the possible inclination of the Georgian corporate governance system towards any of the classical models; The concentration of equity capital is a visible process, within which not only the consolidation of control is carried out, but also the implementation by economic methods of a "self-sufficient" corporate governance model.

3. In Georgia, according to existing business relations, when there are not even corporate governance principles at the initial stage, it is desired to develop recommendatory documents, which, as a result of practical application, will clarify and improve the relevant legal framework.

4. Improving corporate governance requires developing a new corporate governance code for the business sector, amendments to the Law of Entrepreneurs, the Law of Securities Market, and other legal acts. As a result, it will be possible to improve other modern standards of openness and information transparency of corporate governance.

5. Taking into account international experience, in the absence of characteristics of information transparency in companies' corporate governance, scores are calculated and distributed on a 100-point scale. The overall rating is determined by summing the scores. If the rating is high, the risk of investing in this company is higher, and, consequently, the cost of invested capital is rising. At this point, the risk value can vary from 100 to 0 points. According to the model of the state, the rating scale of the information openness rating of corporate governance is as follows: The company bears a low investment risk when the score is up to 28 points; An average investment risk when the score is from 29 to 75 points; If the company takes a high investment risk point is 75 and above. A complete account of these characteristics allows a more objective assessment of the level of information openness and transparency of corporate governance of the national companies.

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## THE FIRST JOINT-STOCK COMPANY IN GEORGIA „CHEMO“ FOR THE PRODUCTION OF MANGANESE AND COAL AT THE TURN OF THE XIX-XX CENTURIES

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### **ABSTRACT**

*The 19th century was a period of sudden change in the way of establishment of bourgeois public relations in Georgia. The abolition of serfdom in Georgia contributed to the development of industrial capitalism. Next to the traditional small production, capitalist manufactories appeared, where the division of labor took place. Production rates were accelerated every year, as a result of which relatively large factories were established in Georgia. Since 1879, the first trade and industrial groups of the big capitalist states appeared in Chiatura (Liphart, Kluge, Skaryagins, Ignatievs and others), in 1879 Gallbauer, a representative of the metallurgical plant (Essene) of the German firm Krupp, Mayer, the director of the iron ore joint-stock company (Gute Hofnung, Westphalia), Baron O. Von Merznfeld representative of "K. Wachter and Company" Baron O. Von Merznfeld of the St. Petersburg trading house, the main supplier of ferromanganese for Russia. In 1880, the French company "Ter Nouveau", Frenchmen E. Pio, M. Soleliak, A. Companion, Italian Gaston Boldet, Greek subject G. Vakulopoulos, Constantinople merchants Tombako and Tyrando-Feldt began to exploit deposit of the Chiatura. At the beginning of the 20th century, according to the amount of mined ore, the list of world manganese mining countries looked like this: Georgia's share in world mining of manganese ore was 36.16%, Spain's share was 9.34%, Russia's share was 7.96%, Britain's share was 7.60%, Germany's share was 6.09%. In order to repel the oppressors of foreign capital, local industrialists continuously tried to act with united force. This group was represented by: Gedevan Chubinidze, Pavle Moseshvili, Ivane Mukhranbatoni, Sergi Meskhi, Samson Abesadze, Nestor Kakabadze, Nikoloz Ghoghoberidze, Solomon Tsereteli, Petre Tsulukidze, Konstantine Guruli, Davit Bakradze, M. Gamrekelidze and others. The vast majority of them were members of the manganese mining joint-stock company " Comradship of Imereti Manganese Ore ". [2. 420] In 1918, by the initiative of the government, a rather strong joint-stock company "Joint-Stock Company of Manganese Industrialists of Chiatura" was established.*

**Keywords:** joint stock company, trade, industry, export, capital, action, monopoly, firm, initiative.

### **INTRODUCTION**

Manganese deposits were discovered in Georgia in the 1940s. Industrial firms of developed capitalist states, especially Germany, became interested in deposits. The rise of interest of Chiatura manganese was due to the rapid growth of world metallurgy, namely steel production. Between 1879 and 1914, Chiatura had a share of 36.16% of the world manganese ore production and 43% of its world export. 92-94% of the total amount of extracted manganese was sold abroad. Since 1879, the first commercial and industrial groups of large capitalist states appeared in Chiatura, which began to purchase and lease deposits.

The local industrialists gathered themselves in the organization " Black Stone Industrialists Joint Stock Company of Chiatura", which was founded in 1898. The ore mined in Chiatura was exported from Poti and Batumi ports.

The economic and social reforms carried out by the Russian Emperor Alexander II (1855-1881) in the 60s of the 19th century brought many positive results. Rural reform led to the destruction of the feudal-serfdom economy , which accelerated the development of capitalist relations in the Russian Empire, including Georgia. Small-scale industries developed, many trade centers were established, railways were built, and large-scale investments from abroad were widespread. Mining industry, of which Chiatura became the center, played an important role in this development of Georgia. [4. 28]

Manganese deposits were discovered in Georgia in the 1940s. Industrial firms of developed capitalist states, especially Germany, became interested in deposits. In 1879 for the purchase and exploitation of a manganese deposit in Chiatura appeared: Gallbauer, a representative of the metallurgical plant (Essene) of the German firm Krupp, Mayer, the director of the iron ore joint-stock company (Gute Hofnung, Westpha-

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In 1909, the newspaper "Momavali" wrote: "Several European capitalists have already bought large estates in Chiatura: in Rgani, Mghvimevi, Tsirkvali, Itkhvisi, Shukruti, Perevisa and other villages from Tsereteli, small landlords and owner-peasants." To combat this phenomenon, a group has already been formed to establish a joint stock company. One member, Chubinidze, contributed 500,000 to strengthen the basic amount of the joint-stock company. [5. 3] The interests of Georgian entrepreneurs were supported, defended and the positions of local economic forces were strengthened by the representative organization "Congress of Manganese Industrialists of Shorapani Mazri", which was headed by prominent representatives of the Georgian intelligentsia: G. Zdanovich (Maiashvili), Ivane (Kita) Abashidze, Nikoloz Ghogoberidze, Petre Tsulukidze, Solomon Tsereteli and others. In order to support Georgian entrepreneurs, local industrialists gathered in another organization - "Black Stone Industrialists Joint Stock Society of Chiatura", which was founded in 1898. The society's duty was to find and manage mining sites of Chiatura, improve the mines and take care of the social condition of the workers.

In the newspaper "Meurne" we read: "On May 20, 1897, a special, meeting of black stone producers was opened in Kutaisi, the meeting was opened by the chairman G. Zdanovich of the council of black stone producers. A commission was chosen to draw up the Syndicate's instructions. Warehouses were opened in the cities: Poti, Shorapani, Zestafoni and Chiatura." [6. 2] The issue of the Chiatura railway was resolved in 1891. 1,513 thousand maneti were allocated for laying the line, in fact it cost 8,000 manats. This amount was fully paid by the treasury. Chiatura-Shorapani narrow-gauge railway with length of 40.5 km was officially put into operation in May 1895. [8. 11-12] In 1900, the number of industrialists in Chiatura reached 300, and the number of individual mines equaled 348 small units. [13. 16-21] In 1902, the "Anonymous Mining-Industrial and Commercial Society" (Societe miniere et commercial) was founded in France, the main purpose of which was the exploitation of Chiatura manganese deposits. Society agent N.I. Votren managed the affairs from Poti.

Since 1905, German capital has continued to enter Chiatura with such serious firms as: "Schalke Union of Miners and Mine Owners", Berlin "Manganese Syndicate", "Gelsenkirchen Mining and Industrial Society", "Deutsche Kaiser Mining Society", "Caucasian Mines Limited Liability Company" (Caucasischen Grubenverein Gesellschaft mit beschränkter Haftung) etc. The beginning of the First World War created unstable conditions for German investments.

According to the decision of the government, the activities of German companies in the Chiatura region were first limited, and then completely stopped. The created liquidation department assessed the entire property of "Gelsenkirchen Mining and Industrial Joint Stock Company" in Chiatura as follows.

**Table 1. Gelsenkirchen Mining and Industrial Joint Stock Company**

Lands and platforms owned and temporarily used by the company	1 354 760 man
Buildings and equipment	388 320 man
Mined ore reserve	777 564 man
Inventory	52 926 man
Cashier	501 man
It was credited to the debtors	104 787 man
Total	2 678 858 man

The material is taken from the work: Margiani G. Georgian industry and industrial proletariat 1864-1917. Tb. 1976 p. 109

English and American capital were also interested in the inheritance of German firms liquidated in Chiatura, in particular, the Russian-English union in London, which was engaged in mining and industrial activities, and the "Russian-American Chamber". The latter informed the Liquidation Department about the acquisition of the enterprises of German firms in 1916. The British Embassy recommended two well-known English firms. These were Ualdis (Middlesborough) and Ferguson (London). In 1917, the liquidation division evaluated the property belonging to all German firms operating in Chiatura and announced its sale by public auction. In the first years of the Republic of Georgia, the financial situation worsened, the tax revenues did not increase anymore, and the tax sources ran out. It was necessary to search for new sources of income. The establishment of a state monopoly on the export of some goods was considered as a way to find additional sources of income, so that more of the profit would go to the state treasury. One of these goods was Chiatura's high-quality black stone-manganese, the export of which was not good. [7. 28]

**Table 2. Dynamics of ore extraction in Chiatura manganese deposits before and after the First World War**

Before the First World War		After the First World War	
Years	Ore mining (in thousands by the poods)	Years	Ore mining (in thousands by the poods)
1906	50 170	1915	15 738
1907	40 833	1916	14 678
1908	6 955	1917	12 488
1909	36 505	1918	7 583
1910	33 805	1919	3 442
1911	28 635	1920	5 610
1912	35 325		
1913	59 188		
1914	40 446		

The state itself decided to conduct this case, without an intermediary, that is, the right to export should also be the prerogative of the government. Realization of product monopoly in real life required preparation: "It is possible for the government itself to carry out the shipping and selling business directly to the foreign market, because it requires great experience, knowledge of the market, etc. requires other and other institutions to entrust their right to practice in life; It can set firm prices for manganese, it is possible to bring in the producers themselves to participate in the profit, and so on. [8. 31]

The material is taken from the work: Margiani G. Georgian industry and industrial proletariat 1864-1917. Tb. 1976 pp. 417-419. In 1918, on the initiative of the Government of Georgia, a rather strong joint-stock company "Joint-Stock Company of Chiatura Manganese Industrialists" was formed. On October 27 of the same year, the charter of this society was approved by the Minister of Finance, Trade and Industry. The society managed all essential and basic matters of manganese extraction and export. The founders of the society, according to the charter, could be persons who had their own plots of land containing manganese, or proper rights to their cultivation, as well as persons who contributed the proper capital, which was defined as 30 million. with manats. It was divided into 60,000 shares of 500 manats each. All shares were distributed among the founders and persons wishing to join the society, and no less than 55% of them were individual and 45% were nominated (unnamed). When 25% of the share capital was made up, the company had the right to start operating, as a result, the company had to fully cash out (pay) the share capital no later than two years from the moment of operation. Those persons who owned at least 25 shares were elected as board members and candidates. Each 50 shares carried one vote, but one shareholder could not have more votes with his shares than 1/20th of the value of the company's share capital, i.e. 5% ownership. [10. 100-101] In order to ensure production processes, "Chiatura's Manganese Industrialists Joint-Stock Company" established with government support planned to issue bonds. It could issue bonds in an amount which would not be exceed half of the total value of the community's real estate.

"Joint-Stock Company of Manganese Industrialists of Chiatura" could not unite all the industrialists of this field. In the 20s of the 20th century, the ownership of ore-rich lands statistically looked like this: the entire area of ore lands in the hands of industrialists included 6,000 acres of land, of which it belonged to:

3,000 Ktseva to the "Society of black-stone industrialists of Chiatura";

Society Gelsenkischen 1000 Ktseva

400 Ktseva to "Caucasus Mining and Ore Society";

250 Ktseva to Foswood;

1 350 Ktseva for all others together;

In addition, another 4,000 Ktseva land containing of ore were accounted (stocks) outside the exploitation zone. [15. 18-19] In the form of "Joint-Stock Society of Chiatura Manganese Industrialists", in the reality of Georgia at that time, we have a typical organizational form of a joint-stock company, which is a monopolist in the extraction and sale of Chiatura manganese ore in the Georgian market. Naturally, this privilege of the "Joint Society of Manganese Industrialists of Chiatura" would not be liked by the private owners who have been playing in the market for a long time and who had made serious investments in this business. In order to ease the tension, the meeting of the founders of the Democratic Republic of Georgia adopted a law according to which: Only the export of manganese was declared a state monopoly. The law left untouched the private ownership of manganese ore-manganese-bearing lands as a material production process, and to some extent, only touched the sphere of circulation. [11. 102]

Taking into account the law and by the initiative of a certain group of Georgian entrepreneurs, whose leaders were the Varazashvili brothers, on November 12, 1919, the partnership "Chiathura's Manganese Export Society" ("Chemo") was formed from the major representatives of Chiatura manganese industrialists. It included such large unions as:

"Chiatura Manganese Industrialists Joint Stock Company"

Kavkasia Manganese Joint Stock Company

Firms "S. Kirivzidi and Comp." and "F. Dupre and Comp."

Manganese industrialist M.S Maoulidisi and others.

An agreement was signed between "Chemo" and the government, according to which the state gave to this company the freedom of the monopoly of manganese export. The agreement granted only this society the right to export manganese from the borders of Georgia. [12. 103-104] The name of the society "Chemo" was connected with the initial letters of its Russian name. The charter of the society was drawn up and the board was formed. Famous figures were invited to the board, and Niko Nikoladze was invited as the chair-

man. Society "Chemo" soon became a powerful organization, it had branches in Germany, England, Turkey, America. [16. 3]

The agreement signed between "Chemo" and the government included important points for the state and it was as was the most important source of its income, it provided for the transfer of all the foreign currency earned from the manganese sold by "Chemo" and 2/3 of the net profit belonging to the foreign manganese industrialists within the society to the government, to the government in foreign currency. The government settled the account to "Chemo" with Georgian money signs in local banks on sterling according to the average exchange rate. 25% of Chemo's net profit from export operations was transferred to the government in foreign currency, while 2/3 of this amount was immediately given to the government upon receipt of the value of the manganese sold by Chemo. In addition, for the grant of a monopoly on the export of manganese, a payment of 2 shillings for each ton of ordinary manganese and 4 shillings for each ton of manganese sold as pyroxide was to be made in favor of the government when the manganese was released from the customs of the Republic.

Due to the government's material interest in the smooth export of manganese in order to supervise the operations of "Chemo", the government reserved the right to control the internal and external activities of the society. [12. 103-104] In the 20s of the 20th century, for the Georgian reality, the "Chemo" society represented an ideal and innovative model of mutual cooperation between private business and the state.

If there has ever been such unanimity, on the part of the government and the industrialists, the state monopoly has been carried out in life, as it happened in the case of the black-stone monopoly of Chiatura, because both sides, both the government and the owners, had a clear idea of the great benefits of their cooperation in this what was brought by this the rule. "Chemo" turned out to be a major financier of the government of the Democratic Republic of Georgia, an example of this is the report of the meeting of the partnership, where we read that ``May 24, 1920 (report#4). 2,000,000 (two million) manats were given to the chairman of the government, Noe Jordania, and consider this as the first contribution, and let's discuss other contributions later. [13. 105] In the future, the authority of the Varazishvili brothers played a decisive role in the fate of the society's existence or non-existence. In 1925 "Chemo" stopped to exist and the June 12 manganese deposit concession was handed over to the American firm "Harriman". [17. 24]

## CONCLUSIONS

The growth of new relations was crowned by the formation of a capitalist system in pre-reform Georgia of the 19th century, which would bring about the biggest turning point in the socio-economic and political life of the country. From that time, a qualitatively new era of bourgeois renewal began in Georgia. Manganese deposits were discovered in Georgia in the 1940s. Industrial firms of developed capitalist states, especially Germany, became interested in deposits. The rise of interest in Chiatura manganese was due to the rapid growth of world metallurgy, namely steel production. Between 1879 and 1914, Chiatura had 36.16% of the world's manganese ore production and 43% of its world export. 92-94% of the total amount of extracted manganese was sold abroad. Since 1879, the first commercial and industrial groups of large capitalist states appeared in Chiatura, which began to purchase and lease deposits.

The local industrialists gathered themselves in the organization "Chiatura Black Stone Industrialists Joint Stock Company", which was founded in 1898. The ore mined in Chiatura was exported from Poti and Batumi ports. After the February revolution, the political environment in Georgia completely changed, a democratic republic was established, which supported the capitalist mode of production and tried to create a favorable environment for foreign capital.

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## INCLUSIVE APPROACH TO INNOVATION SYSTEM DEVELOPMENT AT THE REGIONAL LEVEL

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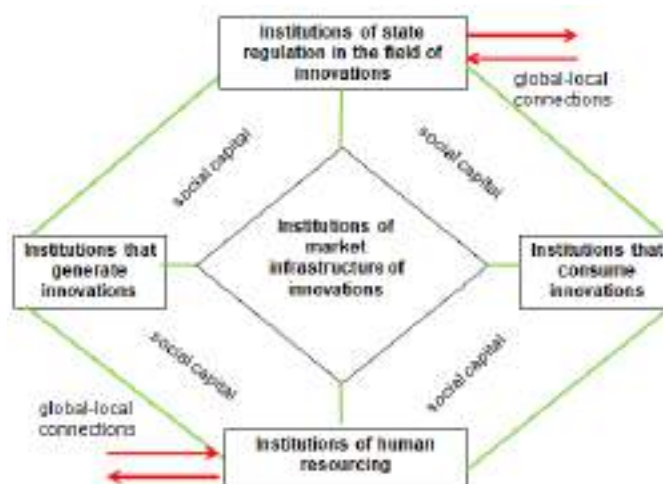
### ABSTRACT

The provided research defines the conceptual principles of the inclusive development of regional innovation systems that combines incentives on the regional innovation system in order to improve its functionality in the interests of business entities, and incentives on business entities in order to increase their innovative capacity and involvement into innovative activities. A methodical approach to the quantitative and qualitative assessment of the regional innovation system is proposed. The quantitative assessment is based on statistical indicators grouped by components of the regional innovation system. For qualitative analysis, tables of expert evaluations are proposed, which allow overcoming the limitations of statistical data.

**Keywords:** innovation systems, region, inclusive, assessment method.

### INTRODUCTION

The task of regional innovation policy is the formation of a favorable environment for the generation and implementation of innovations by enterprises. This environment is formed through the development of regional innovation systems, the constituent elements of which are institution of state regulation in the field of innovations, institutions of generation and consumption of innovations, institutions of market infrastructure in the field of innovations, institution of human resourcing (Figure 1).



**Fig. 1. Conceptual rhombus of a regional innovation system**

Source: Developed by authors (Iermakova, 2019)

The modern development of innovation processes in the regions is influenced by two trends that determine the dual nature of the spatial factor of regional innovation: the increasing role of global connections and the importance of geographical proximity of stakeholders of innovative development. One of the major challenges for the region is that most modern innovation processes are extremely globalized and occur outside the region. Regional strategies are usually aimed at enhancing the region's ability to innovate, but in the vast majority of innovations are implemented in global markets that are outside the region. Today, science and innovation are more internationalized and collaborative-oriented than before. Through international cooperation, there is an opportunity for a global flow of knowledge. Internationalization of innovation

activities facilitates access to the latest international know-how, innovation management and international capital.

The systematicity of regional innovation policy is provided by the comprehensive development of regional innovation systems, the formation of relationships between all their elements. Thus, in particular, the fragmentation of regional innovation systems, such as the gap between demand and supply of innovations, or between demand and supply of personnel, underdevelopment of innovation infrastructure, or regulatory gaps, is a significant obstacle to the innovative development of regions and the country as a whole.

## METHODS

The strategic management of the formation of regional innovation systems is based on the following principles:

- adaptability: the priorities of the innovation development of the region should be determined not by a sectoral approach, but by a functional one, creating opportunities for the regional economy to adapt to unpredictable changes in market conditions in the future;

- uniqueness: the application of the concept of the innovation system in the development of various aspects of the regional innovation policy allows to identify new trajectories of the economic development of regions on an innovative basis, to develop appropriate strategies, mechanisms and tools considering the capabilities and needs of each region;

- resource availability: provision of innovative activity with appropriate resources (financial, human, technical, information), both from local and global sources, by facilitating access to them and creating opportunities for their usage. Innovation policy instruments should consider the socio-economic and financial capacity of communities;

- cross-sectoral cooperation (horizontal coordination): equal partnership and developed communications between all participants of the innovation process, namely: government, business, institutions that generates innovations, consumers of innovations, as well as the interaction of regions with each other at the national and international levels - interregional and cross-border cooperation. According to the sub-index of interrelationships in the field of innovation, Ukraine ranks 78th among 132 countries in the ranking of countries according to the Global Innovation Index. This necessitates the development of intersectoral cooperation, requires effective communications and the availability of social capital, which are poorly developed in Ukraine;

- the dialectic of global and local dimensions: in the innovation sphere, the processes of glocalization are manifested in the complementarity of local factors of innovative development, in particular, the unique innovation environment, human and social capital, with global factors of innovative development.

From the standpoint of the concept of glocalization, the formation of a perfect regional system is insufficient to ensure the efficiency of the regional innovation policy. One of the challenges for regions is that most of today's innovation processes are global and take place beyond the borders of a particular region. Thus, the developers of regional innovation policy have to integrate the existing regional innovation system into the global context through numerous integration channels of obtaining, spreading, reproducing, capitalizing knowledge and technologies. P. Cook's analysis of European regions revealed that "it is impossible to consider the innovation process and policy without constantly taking into account the interactions of local participants with global players" (Cooke, 2005).

P. Cook sees global integration of regional innovation systems through two main channels: global integration of the subsystem of knowledge creation - through global research networks, in which knowledge is disseminated and learning, and also global integration of the subsystem of knowledge consumption - through global production networks, due to which investments are attracted to the region, and local companies enter the markets. It is these two subsystems that interact under the influence of demand and supply for innovations (Benneworth, 2011).



Glocalization of the regional innovation system is the process of effective exchange of the regional innovation system with the results of innovative activity, obtained through the usage of local resources and advantages, with the global community with the help of a developed institutional environment in the field of innovation. It is important that the glocalization of the regional innovation system is a two-way process, which is aimed not only at integration into the global space, but also at involvement of global factors into regional development.

Therefore, the program measures of innovative development of entrepreneurship in conditions of glocalization of economic processes should be aimed at the mobilization of endogenous resources for the development of innovations and the complementary development of global connections of the innovation system, aimed at increasing the ability of business entities to generate and implement innovations.

## RESULTS

The regional innovation system represents the institutional basis of the innovative development of a region. Comprehensive development of all links of the regional innovation system contributes to innovation and economic development, and, on the contrary, the weakness or absence of any link of the system can inhibit the development of a region. For example, the fragmentation of regional innovation systems in the countries of Central and Eastern Europe, the gap between the demand and supply of innovations have become significant obstacles to the implementation of the European innovation policy in these countries. The interdependence between the balanced development of innovation systems and innovation leadership is confirmed by the analytical data of the Global Innovation Index: innovation leaders, including Switzerland, the United States, Sweden, the United Kingdom, the Netherlands, the Republic of Korea, Singapore, Germany, Finland, Denmark, have balanced innovation systems - all sub-index indicators have high grades. At the same time, the least innovative countries have heterogeneous innovation systems: some sub-indices received high marks, others - average, but most - the lowest. For example, Ukraine, which in 2022 took the 57th position in the rating out of 132 countries, has the following ratings: according to the indicator "Knowledge and technology outputs" - high (36th place in the world), according to the indicators "Business sophistication", "Human capital and research" and "Creative outputs" - medium-high (48, 49 and 63 places, respectively), according to the indicators "Infrastructure" and "Institutions" - medium-low (82 and 97 places, respectively), according to the indicator "Market sophistication" - low (102 place) (The Global Innovation Index, 2022).

The identified problems and challenges that need to be solved are closely related to the urgent tasks of ensuring the socio-economic development of Ukraine and its regions, as well as the formation of a regional innovation policy, defined in the Strategy for the Sustainable Development of Ukraine until 2030, the Strategy for the Development of the Sphere of Innovation until 2030, the Concept of the Development of the National Innovation System, the State Strategy of Regional Development for 2021-2027, as well as the implementation of European integration reforms in the field of science and technology.

Providing a strategic approach to the formation of regional innovation systems through the development, adoption and implementation of relevant regional strategies and programs will contribute to the innovative development of regions, ensuring a synergistic effect in the following areas:

1) Regional innovation policy formation and improvement of the efficiency of management of innovation processes at the regional level. Improving the coordination and monitoring of innovative activities by local authorities and creating a specialized organization for the implementation of regional innovation projects (or entrusting these functions to an already existing organization) will avoid duplication of responsibilities in the field of innovative activities and will help to concentrate the control over innovative processes within one organization;

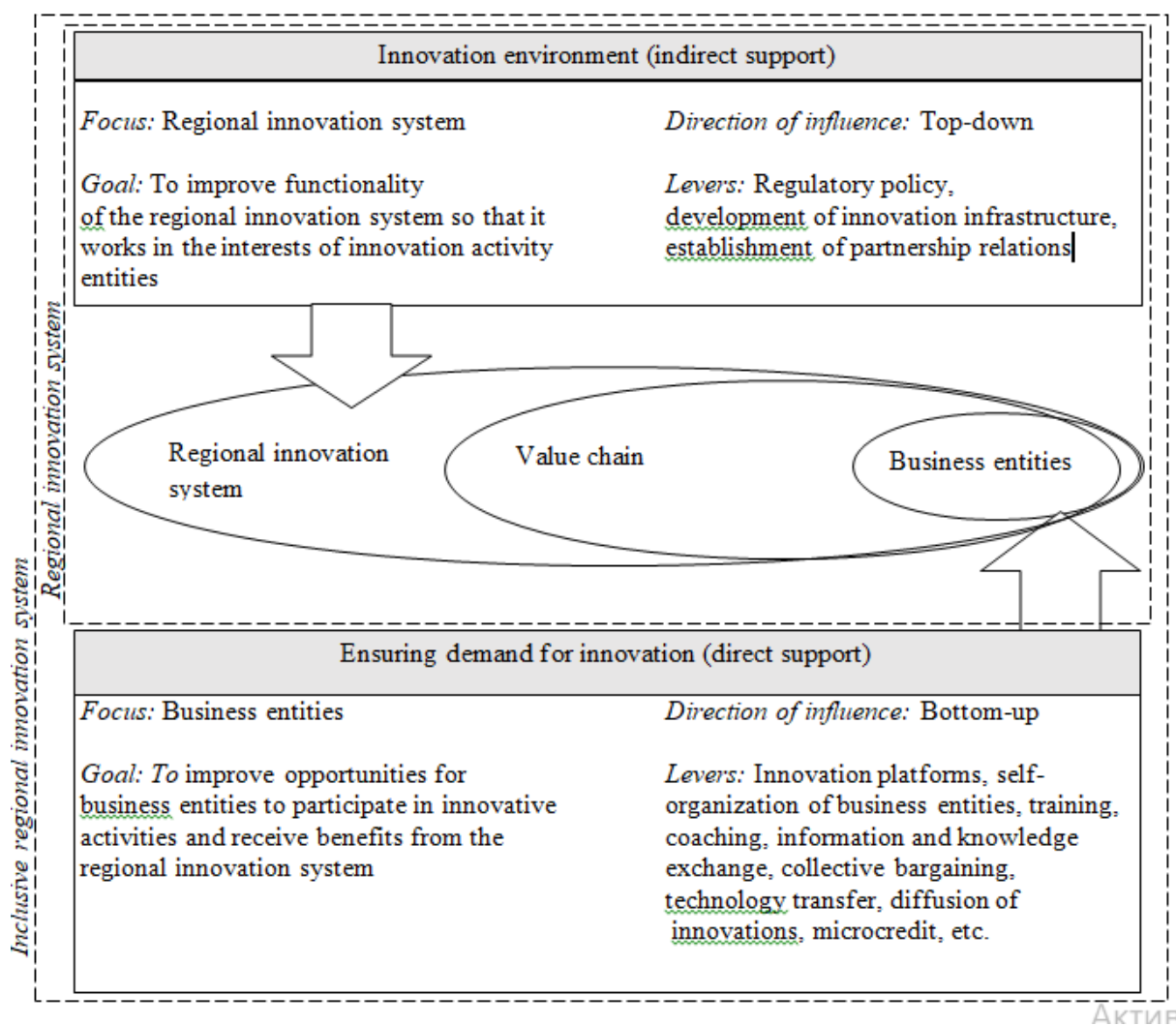
2) Improvement of procedures for development and further implementation of regional innovation strategies and programs. As international experience shows, regional innovation programs are an effective tool for implementing innovation policy. Adequate financial support of these programs will allow the full imp-

Implementation of program measures. It will lead to stronger ties between science and industry, better usage of the results of advanced scientific research in industry. It will also lead to the development of regional innovation infrastructure and an increase in the share of innovative enterprises in the regions.

3) Financial stimulation of innovative activity. The implementation of tax incentives for innovative activity at the regional level will become a powerful tool for the implementation of regional innovation policy.

4) Improvement of human resources for innovative activities in the regions. Attracting talents and developing innovative thinking and creativity as part of the educational training of future specialists are important tasks in terms of the innovation economy.

5) Development of innovation infrastructure. Innovation infrastructure is necessary for the development of a favorable innovation environment in the region and the state's implementation of its financial-economic, production-technological and organizational-information measures in the field of innovative activity. Formation of a favorable innovation environment is the main task of regional innovation policy.



**Fig. 2. Inclusive approach to the development of the regional innovation system**

Source: Developed by the authors on the basis of (Moore, 2018)

The inclusive approach combines incentives on the regional innovation system in order to improve its functionality in the interests of business entities, and incentives on business entities in order to increase their innovative capacity and involvement into innovative activities.

It is proposed to assess innovation systems at the regional level basing on the existing statistical information in Ukraine. Statistical indicators for such an assessment, grouped by components of the regional innovation system, are presented in Table 1.

**Table 1. Indicators for assessment of regional innovation systems**

<b>Groups of indicators</b>	<b>Indicators</b>
<b>1. Institutions of state regulation in the field of innovations:</b>	
<i>1.1. Regulatory institutions in the field of innovations</i>	Index of business climate in the regions of Ukraine
<i>1.2. State financial incentives for innovations</i>	Share of enterprises with technological innovations that received financial assistance from the central government for innovative activities in the total number of enterprises with technological innovations
	Share of enterprises with technological innovations that received financial assistance from local and regional authorities for innovative activities in the total number of enterprises with technological innovations
	The amount of expenses for the implementation of R&D from the budget
	Share of budget funds in the costs of R&D
<i>1.3. Institutions of non-financial stimulation of innovations (technological readiness)</i>	Number of mobile users
	Number of Internet users
	Number of new technological processes implemented at industrial enterprises
<b>2. Institutions of generation and consumption of innovations:</b>	
<i>2.1. Institutions of generation of innovations</i>	Organizations conducting research and development
	Number of industrial enterprises engaged in innovation activity
<i>2.2. Institutions of consumption of innovations</i>	Number of industrial enterprises implementing innovations
	Number of implemented R&D
<b>3. Institutions of market infrastructure in the field of innovations:</b>	
<i>3.1. Financial institutions in the field of innovations</i>	Costs for innovation of industrial enterprises at the expense of investors' funds
	Costs for innovation of industrial enterprises at the expense of loans
	Number of leasing centers
	Number of entrepreneurship support funds
	Number of investment funds and companies

<i>3.2. Production-technological institutions in the field of innovations</i>	Share of enterprises with technological innovations that had an innovation cooperation partner in the total number of enterprises with technological innovations
	Number of technoparks and industrial parks
	Number of business incubators
	Number of SME support infrastructure facilities created with the participation of local authorities
	Volume of implemented R&D services on enterprises (institutions)
<i>3.3. Information structures in the field of innovations</i>	Share of external sources of information for innovative activities of enterprises with technological innovations
	Number of information and advisory institutions to support SMEs
	Volume of implemented information services on enterprises (institutions)
<i>3.4. Innovation market</i>	Share of enterprises with technological innovations that carried out market introduction of innovations in the total number of enterprises with technological innovations
	Share of implemented innovative products in the total volume of implemented industrial products
<b>4. Institutions of human resourcing in the field of innovations:</b>	
<i>4.1. Human resourcing</i>	Number of scientists who received a scientific degree in the current year
	Share of employees that involved into R&D in the total number of employees
	Share of employees at innovative enterprises in the total number of employees

Source: Developed by the authors (Iermakova, 2019)

The assessment of regional innovation systems is proposed to be carried out in the following stages (Iermakova, 2019):

Stage 1: Formation of a database of indicators according to the selected system of indicators for regions of the country. All indicators selected for analysis (Table 1) have a positive stimulating effect on the innovation development of the region, and therefore are stimulants.

Этап 2: Rationing of indicators. The necessity of indicators rating is due to their heterogeneity. Therefore, it is advisable to evaluate the indicators in comparison with the established baseline value. Within the framework of this methodical approach, we propose to evaluate each characteristic of the regional innovation system in relation to the corresponding indicator of the leader region with the maximum value of the assessed characteristic.

Rationing of indicators is carried out according to the following formula (1):

$$N_{ij} = \frac{x_{ij}}{x_{i\max}}, \quad (1)$$

where  $N_{ij}$  – the normalized value of the  $i$ -th indicator in the  $j$ -th region,  $x_{ij}$  – actual value of the  $i$ -th indicator in the  $j$ -th region,  $x_{i\max}$  – the maximum value of the  $i$ -th indicator in all regions,  $i = 1 \dots n$  – number of indicators,  $j = 1 \dots J$  – total number of regions according to the administrative-territorial structure of Ukraine.

The variation of the normalized values  $N_{ij}$  takes place in the range [0; 1]. At the same time, the value of the indicator, which is equal to "1", means that the region is the leader in the corresponding characteristic, while if the value is close to "0" – the backlog of the region by the corresponding indicator.

Stage 3: Calculation of the consolidated index as the average geometric value of the indicators covered: Index of state regulation in the field of innovations, Index of generation and consumption of innovations, Index of market infrastructure in the field of innovations, Index of human resourcing in the field of innovations, integral indicator – Index of the regional innovation system.

Stage 4: Analysis of the received indices, identification of strengths and weaknesses of the regional innovation system.

Indicators of innovative activity are recorded in Ukraine at the level of regions, there are no corresponding statistics at the level of communities yet. Therefore, for the analysis of the innovative environment at the level of communities, it is possible to adapt a self-assessment tool that is used for the study of regional innovation systems and the determination of smart specialization (Getting started with the RIS3 KEY, 2012).

To conduct such an analysis is suitable with the help of tables, by analogy with the analysis of competitive forces according to the theory of M. Porter (Power Branding, 2013), evaluating each parameter in points that reflect the low, medium or high level of development of each of the components of the regional innovation system (Filipishyna, Bessonova, Venckeviciute, 2018; Kovshun et al., 2021). To assess the level of development of the innovative system of the community, it is required to fill in five tables below.

In each table, the parameters for evaluating each of the components of the innovation system are given:

- demand for innovations (Table 2);
- supply of innovations (Table 3);
- infrastructure in the field of innovation (Table 4);
- state regulation in the field of innovations (Table 5);
- human resources in the field of innovation (Table 6).

The parameters are evaluated on a 3-point scale. In order to evaluate each of the parameters, it is enough to choose one of the three statements in the table and give the corresponding score from 1 to 3. The given points are summed up at the end of each table and their description is provided.

**Table 2. Assessment of the level of demand for innovations in the community**

Parameter	Assessment		
	1	2	3
The amount of funding that spent on innovation at the enterprise	up to 1 million UAH	1-10 million UAH	more than 10 million UAH
Requests on R&D	No requests	There are requests, but there are no suitable executors	Requests are fulfilled
The necessity to implement innovations at the enterprise	No necessity	There is a necessity, but there is no possibilities	There is a necessity and possibilities

<b>Total score</b>			
3 points	low level of demand for innovations		
4-6 points	medium level of demand for innovations		
7-9 points	high level of demand for innovations		

**Table 3. Assessment of the level of supply of innovations in the community**

Parameter	Assessment		
	1	2	3
Ability to implement innovative startups	No innovative startups	There are startups, but there is no possibilities to implement them	There are startups and opportunities to implement them
Source of innovative developments for implementation	Abroad	Within the company	In the community
Scientific sector in the community	Absent	Established connections at the regional level	Developed
<b>Total score</b>			
3 points	low level of supply of innovations		
4-6 points	medium level of supply of innovations		
7-9 points	high level of supply of innovations		

**Table 4. Assessment of the level of infrastructure development in the field of innovation in the community**

Parameter	Assessment		
	1	2	3
Innovation financing	Funds of the enterprise	State funds	Private funds
Involvement into production and technological networks, industry-scientific communications	Not involved	Networks exist, but do not meet the needs of the enterprise	Involved
Availability of research infrastructures	Absent	Have a local importance	Have a national / international importance
Information support of innovative activities	Absent	Fragmentary	Systemic
<b>Total score</b>			
4 points	unsatisfactory infrastructure		
5-8 points	satisfactory infrastructure		

9-12 points	favorable infrastructure
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**Table 5. Assessment of the level of favorability of state regulation in the field of innovation in the community**

Parameter	Assessment		
	1	2	3
Strategic priorities of the region in the field of innovation	Undefined	Defined, but not supported by appropriate incentives	Defined and supported by appropriate incentives
Involvement of the private sector into the development of the innovative policy of the region	The innovation policy of the region is not developed	The innovation policy of the region is developed, but the private sector is not involved	The innovation policy of the region is developed, the private sector is involved
State financial stimulation of innovative activity	Absent	It is provided, but the mechanisms for obtaining it are not clear	It is provided, the mechanisms for obtaining it are clear
State non-financial stimulation of innovative activity	Absent	It is provided, but does not meet the needs of the enterprise	It is provided, meet the needs of the enterprise
<b>Total score</b>			
4 points	unfavourable government regulation		
5-8 points	satisfactory government regulation		
9-12 points	unfavourable government regulation		

**Table 6. Assessment of the level of human resourcing in the field of innovations in the community**

Parameter	Assessment		
	1	2	3
Involvement of scientists to work at the enterprise	Not involved	They are involved, but the practice was unsuccessful	They are involved, the practice was successful
Necessity in scientific personnel	Absent	There is a necessity, but there are no specialists of the appropriate specialization	The necessity is fully satisfied
Personnel training	At the enterprise	Outside the region	In the region
Умови проживання в громаді	Несприятливі	Потребують покращення	Сприятливі

<b>Total score</b>	
4 points	unsatisfactory human resourcing
5-8 points	satisfactory human resourcing
9-12 points	favorable human resourcing

*Source: Developed by the authors*

The results of five tables must be joined within a single table with the following content: parameter, determined level, description of the situation, program measures.

The proposed methodical approach makes it possible to make a qualitative analysis of the innovation environment of the community and to overcome the limitations of statistical data.

## CONCLUSIONS

The task of the regional innovation policy is the formation of a favorable regional innovation system. It is proposed to provide an inclusive approach to the development of the regional innovation system: on the one hand, improving its functionality in the interests of business entities, and on the other hand, stimulating business entities to increase their innovative capacity and involvement into innovative activities.

A methodical approach to the quantitative and qualitative assessment of the regional innovation system is proposed. The quantitative assessment is based on statistical indicators grouped by components of the regional innovation system. For qualitative analysis, tables of expert evaluations are proposed, which allow overcoming the limitations of statistical data.

Development of the regional innovation policy on the basis of quantitative and/or qualitative analysis of the regional innovation system ensuring consideration of the features and specific opportunities of the region.

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## THE MODERN MODELS OF THE SUSTAINABLE TOURISM IN THE CONTEXT OF THE REGION'S STRATEGIC DEVELOPMENT

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### **ABSTRACT**

*The dynamic development of the tourism industry, regardless of its contribution to the world economy, has negative consequences for the natural environment. These are pollution of water resources, soil, climate change, inefficient use of energy resources, destruction of natural monuments, destruction of biodiversity. The real impact of tourism on the environment is also hidden, as its assessment does not take into account the impact of transportation, hotel and restaurant business, which are perceived as separate sectors of the service sector. The growth of the share of tourism in the total world GDP and the deepening of environmental problems associated with its development encourage society to search for new vectors of development, including the adaptation of the principles of the Concept of Sustainable Development to the context of tourism. An example of one form of sustainable tourism is ecological tourism. The southern regions of Ukraine have enormous tourist and recreational potential for the development of ecological tourism. The article provides examples of the development of ecological (rural) tourism based on facilities that provide tourist services in the Kherson region. Environmental certification of tourist facilities is considered as a mechanism of the «greening» of the industry, increasing their competitiveness in the market of tourist services and improving image attractiveness.*

**Keywords:** *tourism industry, impact on the environment, environmental problems, sustainable tourism, ecological tourism, the «greening» of the industry.*

### **INTRODUCTION**

Tourism business is an activity that deserves attention in the global world, as it develops at a fast pace and accounts for more than 10% of the total world income. At the same time, the development of the industry is dangerous for the environment due to the irrational use of significant amounts of non-renewable resources such as energy and water resources used to provide tourism services. In addition, land resources allocated for the construction of new facilities and for the laying of new transport highways are under the influence. Locating tourist facilities in areas sensitive to human impact on living nature, creating waste, including hazardous to human health – all these are significant environmental factors for the development of the industry.

### **METHODS**

The methodological basis of the paper is a dialectical method and a systematic approach to the analysis of ecotourism as a activity of organizing not only the travelers' recreation but also as the one that promotes meaningful, more environmentally friendly tourism, ecologization («greening») of hospitality, and increasing the ecological awareness of tourists. The method used by the author is the desk research method. We used information resources of the world network Internet, national and regional tourism development programs, the official websites of Ukraine, official web sites and internet portals of international organizations: UN, UNWTO, the International ecotourism society.

### **RESULTS AND DISCUSSION**

Despite the contribution of the tourism industry to the dynamic development of the world economy, it has certain negative consequences for the natural environment: pollution of water resources, soil, climate change, inefficient use of energy sources, destruction of natural monuments, destruction of biodiversity, etc. In addition, the real impact of tourism on the environment is also hidden, since its assessment does not take

into account the impact of transportation, hotel and restaurant business, which are perceived as separate sectors of the service sector, and not as interconnected components of a single complex, the main whose task is to meet the needs of consumers of tourist services.

The consequences of the impact of tourist activities on the quality and state of the natural environment depend on a number of important aspects. First of all, this is the establishment and observance of limits on the use of natural resources, emissions and discharges of pollutants, placement of waste in the process of activity, in which the ecological balance is maintained and the ability of natural complexes and objects to self-renew is not lost.

Intensive recreational exploitation of territories must necessarily include measures to improve the territorial structure, restore natural resources, and minimize the negative anthropogenic impact on the environment.

One of the ways to solve the problem of the "recreation-environment" system is the application of various ecologically oriented measures: economic stimulation of nature-friendly activities, attraction of nature protection investments.

Such measures include the stimulation of the rational use of natural resources in the process of recreational activities through the provision of tax incentives for tourist enterprises when switching to resource-saving technologies, the introduction of modern cleaning equipment, equipment for the disposal of pollutants and waste processing, which will contribute to the improvement of environmental protection (Kubai, 2018).

An ecologically-oriented approaches to recreational activities are an effective mechanism for balancing anthropogenic and man-made loads on recreational complexes. In addition, one should not exclude ecological and economic approaches to recreational activities in the context of sustainable development, which, first of all, should be aimed at:

- improvement of the ecological condition of natural complexes, objects and territories of tourist interest;
- preservation and restoration of disturbed or changed (degraded) ecosystems by changing the mode (method) of their use;
- calculation and establishment of the permissible number of tourists for a certain recreational season;
- modernization of equipment and treatment facilities used in tourist infrastructure;
- environmental education, etc. (Boyko V.O., 2021).

The growth of the share of tourism in the total world GDP (gross domestic product) and the deepening of problems related to its development encourage society to search for new vectors of development, including the adaptation of the principles of the concept of sustainable development to the context of tourism (Nikolaev et al., 2009).

The main reason for the emergence of ecological tourism at the current stage is the negative impact on natural and cultural-historical resources, which grows in direct proportion to the rate of growth in the number of tourist visits. Thus, the satisfaction of tourist demand and the rational use of natural resources are in a certain contradiction.

In the 90s of the 20th century the World Tourism Organization proposed to consider sustainable tourism as a direction of managing all resources in such a way that economic, social and aesthetic needs can be satisfied while simultaneously preserving cultural identity, basic ecological processes, biological diversity and human life systems.

According to the Sustainable Tourism Charter, «tourism development should be based on sustainability criteria. This means that it is environmentally acceptable over a long period of time, economically viable, and ethically and socially fair and equitable to local communities».

The concept of sustainable tourism also appeared, as a modern concept of tourism development based on the principles of the Concept of sustainable development. This is tourism that satisfies has all existing needs, but at the same time develops in such a way as to provide similar opportunities for future generations, and is based on such principles as:

- environmental protection and minimization of damage in the process of tourist activity, environmental supervision of the state of tourist development of territories;
- controlled use of technologies for providing services, including related ones: motor vehicles, use of energy, water, etc.;
- social justice for local communities: income and other benefits from tourism should be distributed on a parity basis, taking into account the interests of the local population;
- tourist activities and infrastructure should organically flow into the historically formed environment and preserve the unique character of each area.

It is important to note that there are two common approaches to defining the concept of "ecotourism" today.

In the first case, ecotourism is tourism, the main object of which is wildlife. At the same time, most experts note the difficulty of drawing a border between nature and traditional culture, which is included in ecotourism objects.

Another approach – ecological tourism is considered as an example (type) of sustainable tourism. In our opinion, this is a more correct approach. Because this type of tourism is based on and successfully implements in practice the main principles of the concept of sustainable development and nature management. This, in turn, does not lead to the degradation of resources, since a part of the benefits from its development is used to restore and protect the latter. With this approach, tourism objects can be of both natural and artificial origin.

In other words, ecological tourism means a form (type) of tourism with certain properties, and sustainable means a direction of development based on the principles of the concept of sustainable development. Therefore, it is clear that sustainable tourism can be of any other kind, not necessarily ecological, but any ecotourism can be called an example of sustainable tourism.

Thus, ecological tourism is nature-oriented sustainable tourism. Its main characteristics can be defined as follows:

- natural orientation – features of tourist demand,
- sustainability – the economic benefit of maintaining the quality of the environment.

Regarding the main goals of ecotourism, these are:

- improving the culture of "human-nature" relations;
- development of ethical norms of behavior in the natural environment;
- fostering a sense of personal responsibility for the state of the environment and its individual elements;
- restoration of a person's spiritual and physical strength, provision of a full-fledged rest in the natural environment (Bochkareva, 2002).

The main components of ecotourism include:

- "knowledge of nature", i.e. travel involves the presence of elements of nature study, acquisition of new knowledge and skills by tourists;
- "preservation of the ecosystem" involves the appropriate behavior of the group on the route and the participation of tourists, tour operators in programs and measures to protect the environment;
- "respect for the interests of local residents" - compliance with local laws and customs, as well as the contribution of tourism to the socio-economic development of tourist centers (Dyudyaeva et al., 2022).

Following to the European tourism practice, the new forms of ecotourism have appeared in Ukraine, such as natural parks, eco-resorts, eco-cottages, eco-farms, etc.

The reference model of the eco-complex has well-trained staff and professional guides who communicate with guests of the facility. Located in pristine natural areas, they often have significant ecological significance and strong environmental protection programs. They support ethical employment practices and contribute to the development of the local economy. Apply the best technologies to reduce energy use and rational waste management.

- Eco-resort – visually and in terms of design, it is similar to the reference model, but differs in purpose and, as a rule, is located near water bodies and is focused on the provision of entertainment services and other personal services.

- Eco-cottages and campsites – small houses or campsites that are located in areas with picturesque landscapes, built a long time ago for specific purposes not related to tourism. Many of them are adapted and maintained for living. Over the past few years, "glamping" (a portmanteau of the words "glamour" and "camping") has become one of those popular brands in the travel industry that has gained a lot of popularity among travelers. There is a trend of development of this type of tourism, as mass tourism has contributed to the strengthening of the spirit of ecologically responsible travel.

- Rural eco-complexes are simple private residences located in the countryside or in small villages near nature reserves. Service staff and guides are local residents without professional skills. Provide an opportunity to see exotic wildlife, but not completely isolated from civilization.

- Eco-farms – rural projects that use farm houses and other premises of farms. Some are custom or purpose built m. These projects should contribute to obtaining additional income for farmers and small communities (Arsenyeva et al., 2010; Boyko, 2020).

Ecological tourism in Ukraine began to develop not so long ago, but today many participants of the tourist market offer their product with the "eco" application. But not all of them are aware of the classic understanding of the term "ecotourism", which is based not only on recreation in nature, but also on the educational component, the consciousness of tourists and the key role of local culture (Romanenko et al., 2020).

For Ukraine, and especially for the South of the country, which is a region with enormous tourist and recreational potential, the issue of the development of ecological tourism is quite relevant. But according to experts, this potential is not fully revealed.

Kherson Oblast, as one of the regions of the southern region, is a unique territory in terms of available recreational and tourist resources: more than 80 objects of the nature reserve fund of national, international and local importance, including the Chornomorskyi and Askania-Nova biosphere reserves, 5 national natural parks: Azov-Syvaskyi, Dzharylgatskyi, Nizhnyodniprovskiyi, "Oleshkivski Pisky", "Kamyanska Sich". There are more than 5,000 objects of historical and cultural heritage in the region, including the legendary Kamian and Oleshkiv Sichi, Scythian mounds, ancient fortifications, remains of Turkish fortifications, Cossack crosses, etc. Unfortunately, most of them suffered greatly from the Russia's full-scale military invasion.

For the southern regions, the development of sustainable tourism should become a priority sector of the economy. Of course, the concept of sustainable tourism development, with full compliance with the principles of harmonious development, is difficult to implement, but at the same time, it is a reference point that should be strived for (Strategy, 2021).

Kherson region is ecologically clean, attractive for investment and open for cooperation with its inexhaustible natural and human resources. Tourism, recreation, treatment and rehabilitation are becoming more and more important in the socio-economic development of the region. In recent years, Kherson region has actively developed various types of nature-friendly tourism, including green or ecological tourism. Among more than 1,000 recreation, health and accommodation facilities in the region, which provide services to guests of the Tavria region, there are more than 60 estates of green tourism. These tourist facilities actively implemented the principles of sustainable tourism and "sustainable" tourist behavior in their activities.

One of the examples of the development of ecotourism in the Kherson region is the complex Green Farms of Tavria – the only complex in Eastern Europe located in the untouched nature of the Tavria forest-steppe zone.

The territory of the farms covers more than one hundred hectares, where real active recreation in the fresh air is possible, as well as recreation with children, wedding celebrations, birthdays and other holidays. But rest on the farms is not easy, it will definitely bring benefit and pleasure. In addition to fresh and clean air, the Green Farms of Tavria offer to get acquainted with folk crafts and culture of Ukraine.

Many small thematic farms are located throughout the complex. The owner of the farm meets the guests, talks about the craft and demonstrates his skills, you can take a master class with him and make a gift or amulet with your own hands. At the farms, you can get acquainted with blacksmithing and pottery, shoemaking, weaving, make a doll, visit the shooting and cannon yards, visit the horse yard and ride horses, paint at the artistic farm, make a charm or get acquainted with beadwork, at the Cossack farms – learn the history of Ukrainian money and make a lucky coin with your own hands, at a fishing farm – try homemade kvass, familiarize yourself with the technology of wool felting, candle making, soap making, or try your hand at rock climbing or a rope park.

For children, in addition to master classes, the farms have a lot of interesting things: a bench with ready-made souvenirs and gifts, swings, swimming pools, quad biking, water ditches for swimming, as well as a dance floor.

At Green Farms of Tavria, you can taste real delicious dishes of Ukrainian cuisine: borscht, donuts, fresh vegetables, mashed potatoes with meat, cabbage rolls, colored lard. Or to eat your own food, which you brought with you, it is enough to find a cozy corner for accommodation, and there are many such corners in the farms.

Due to the development of rural green tourism, material well-being increases and employment problems of the rural population are partially solved. Every year, as part of the International Tourism Forum «Kherson region – recreation, treatment, travel in the ecological conditions of Tavria», meetings and presentations of the potential of rural green tourism are held as a promising direction for the revival of the village and the development of the rural areas of Southern Ukraine [10].

In general, the idea of sustainable tourism is not yet sufficiently widespread in Ukraine. However, the subjects of tourist activity on their official websites and advertising brochures provide tourists with advice on how to become a "sustainable" tourist and adhere to the principles of sustainable tourism. It is also important to provide the consumer with tourist information they provide information not only through quantitative indicators about the object, but also data about the economic efficiency of the use of the recreational resource, reliable information about the environmental conditions of operation and environmental risks.

Implementation of the principles of sustainable tourism at the level of individual regions is possible by coordinating the efforts of state and non-state structures to increase the efficiency of recreational and touristic nature use. The main goal of their activity should be to establish optimal criteria for the use of natural resources for tourist purposes. The activity of local governing bodies, public and private organizations, which participate in the development and implementation of the development program of specific territories for the purpose of recreation and tourism, is of great importance in relation to the use of natural resources in the field of tourism. Their cooperation with nature protection bodies will ensure the comprehensiveness of balanced nature management actions.

An example and confirmation of such cooperation of all those interested in the development of the Kherson region is the Development Strategy of the Kherson region for the period 2021–2027 (Strategy, 2021). The document noted that the region has significant resources to become one of the most developed regions in Europe in the tourism sector. Moreover, among the priority areas of development of the industry, it was emphasized to increase attention to the development of domestic inbound, ecological tourism, the primary task of which is due attention to the preservation of the environment.

Today, the world community by its actions confirms the understanding of the need for immediate changes in the attitude to nature management and uses a number of marketing tools, including increasing the investment attractiveness of territories. This is very important for regions where the development of the tourism industry is one of the priority directions of its sustainable development.

The tourism industry, compared to other sectors of the economy, is quite open and public, as almost every person can be a participant in it (or provide services or produce products necessary for the industry to function, or consume them). Therefore, the state of the industry and its dynamic development can change the consciousness of many layers of the population through the spread of knowledge and increased public

awareness, even through its own example of sustainable consumption of resources in the provision of services and production of related products.

Thanks to a systematically organized tourism business, it is possible to introduce effective mechanisms for the use of natural resources, preservation of cultural traditions of regions and, thus, to prove the importance of implementing and observing the principles of sustainable development of territories, including for the development of tourism in the future.

In October 2008, the participants of the international scientific and practical conference «Practice of modern tourism: social and economic efficiency», held with the support of UNWTO, confirmed their clear position on the sustainable development of the industry and adopted the Declaration of Environmental Responsibility of Tourism Business.

One of these mechanisms is the environmental certification of tourist services and facilities that carry out recreational activities.

Environmental certification of tourist services is a confirmation of compliance that the economic entity in this sector of the economy meets the established requirements and environmental criteria. The goal of certification is to change behavior and practices in all sectors of a given business. A change in behavior occurs at facilities providing tourist services, among tourists using these services, and in local communities where business entities are located. There is a change in consciousness and responsibility for the state of the natural environment with all its components.

Greening the tourism industry also has economic benefits: small financial costs will help save energy and heat resources, which are becoming more expensive every year. Today, based on the results of the implementation of this mechanism at tourist business facilities, there is confirmation that the implementation of an energy management system (EMS) at small and medium-sized business facilities, which are, in most cases, tourist business facilities, saves up to fifty percent of costs for energy and heat resources. In this way, business entities not only show their high environmental awareness, but also significantly strengthen their ecologically oriented image. According to statistical data and other observations, today when choosing a tourist route or a place of recreation, up to forty percent of tourists prefer those that have an ecological certificate.

The general requirements and criteria for environmental certification are based on the principles of the concept of sustainable tourism, the main of which are:

- stimulation of local development;
- preservation of the natural environment and cultural heritage;
- public and tourist education.

The system of environmental certification of tourism facilities is based on international standards recognized by the world community. The rules and procedure for its implementation correspond to international certification practices adapted to modern realities, including the capabilities and needs of vacationers.

Modern mechanisms of environmental certification take into account the provisions of the most common international, regional and local (or private) standards, including ISO 14001 (ISO 14001, 2015), the scheme of environmental management and audit EMAS, Ekomapping, EU Ecolabel, Green Globe, Rainforest Alliance, Green Key, Blue Flag and others.

According to the results of the assessment of compliance with the requirements of the selected standard, the business entity providing tourist and related services receives an environmental certificate. This can be confirmed by:

- certificate/diploma/distinction received by tourist industry facilities (hotels, camping sites, sanatorium facilities, rest houses, restaurants, recreation facilities that provide services on the water (beaches located on the coasts of seas, lakes, rivers ), other leisure facilities, etc.);
- a trade mark used to designate goods in the tourism industry that meet the principles of sustainable tourism.

Among the first and most widespread international programs of eco-labeling and environmental certification of subjects of the tourism industry were "Green Key" and "Blue Flag" (Fig. 1).



**Fig. 1. Examples of eco-labels in the tourism industry**

The first program was offered for accommodation, recreation and sports, business and conference centers in Holland in 1994 by the International Public Environmental Organization (Foundation for Environmental Education, FEE). The program is aimed at implementing SEM as part of the system of corporate social responsibility and environmental education. Optimizing the use of resources, for example, due to energy management allows you to save up to 25 percent on the use of electricity. Tourist business facilities, implementing this program, show their place in the sustainable development of the industry, their social responsibility to society. According to FEE, more than 2.5 thousand tourist facilities from more than 50 countries of the world received the "Green Key" award. The first facility to receive the Green Key distinction in Ukraine was the Radisson Blu Kyiv hotel in 2011.

According to the second program, which has been known since 1987, beaches, marinas, operators of sustainable water tourism in more than 50 countries of the world are subject to environmental assessment. The certification of facilities is carried out by FEE, which actively cooperates with international and European organizations and associations, including the European Environment Agency (EEA), the European Network of Accessible Tourism (ENAT), the Coastal and Maritime Union (EUCC), the International Union for Conservation of Nature (IUCN), United Nations Environment Program (UNEP), United Nations World Tourism Organization (UNWTO) and others.

A number of regional programs to support the development of rural green tourism have also been implemented in Ukraine today. Among the most widespread is the system of (voluntary) environmental labeling of agricultural estates "Green Estate", proposed by the Association for the Promotion of the Development of Rural Green Tourism in Ukraine. The system was developed on the basis of the best international practices with the support of the Swiss Foundation. In accordance with this program, signs approved by regional offices are used (Fig. 2).



**Fig. 2. Examples of eco-labeling of tourist services in Ukraine**

Marking with the "Green Manor" sign guarantees a careful attitude to the environment, the placement of the tourist object in an ecologically clean and attractive place, located at a safe distance from the sources of

environmental risk, in compliance with the established environmental standards for the maintenance of the manor, its territory, food conditions and providing advantages of ecologically clean products of local production, prepared according to traditional technologies, rational use of water resources, electricity and fuel, limited use of household chemicals, support of folk traditions, etc.

The use of eco-labeling by tourist establishments demonstrates to consumers of tourist services the ecologically conscious activity of a business entity aimed at reducing the impact on the environment, popularizes and stimulates the implementation of useful initiatives and methods of managing tourist activities that are environmentally friendly to the environment.

Today, the National Tourism Organization, together with the National Standardization Body of the Ukrainian National Institute of Natural Resources and Information Technology and the Technical Committees TK 118 and TK 169, started work on the development of national standards in the field of tourism, which harmonize with international standards. One of the first was the national standard of Ukraine DSTU 9105:2021 Tourist services. Rural tourism. General requirements. Classification of means of accommodation (DSTU 9105, 2021).

Sustainable tourism is developing dynamically, and consumer demand for it is also growing. Tourism providers are developing new environmental programs and governments and international organizations are creating new policies to promote sustainable tourism. For example, the Global Tourism Sustainability Council (GSTC) has developed minimum commitment criteria for any tourism industry organization seeking to implement sustainable development practices. Their activities should be aimed at achieving four main goals: demonstration of sustainable management of the territory; maximizing social and economic benefits for the host community and minimizing negative impacts; maximizing benefits for communities, visitors and cultural heritage with minimal impact; maximum benefits for the environment and minimal negative impact on it. These criteria are proposed by the tourism community in response to global challenges stemming from the UN Millennium Development Goals (Tunyk, 2013).

## CONCLUSIONS

Eco-labeling and ecological certification promotes the principles of sustainable and environmentally conscious tourism. It has been partially proven that the objects of the tourism industry, which use the mechanism of «greening» of the industry, have the advantage of being more competitive in the market of tourist services, increasing their image attractiveness and developing more intensively.

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## SOCIO-ECONOMIC PROCESSES REGULATIONS AT THE REGIONAL LEVEL

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### **ABSTRACT**

*In the article, the authors consider the problems of regulation of socio-economic processes at the regional level. It is determined that a feature of the process of regulation of economic systems is its conditionality by internal impulses and contradictions of economic development. According to the authors, such a mechanism of state regulation is needed, based on which the economic method of management will be optimized on the principles of economic freedom and the necessary regulation through stimulating the growth of financial stability. Based on this, the authors proposed a scheme of the organizational and economic mechanism for regulating small business in the region, recommended an integrated approach to assessing measures of state regulation of small business in the region. The researchers also suggested directions for improving the regulation of socio-economic processes at the regional level. The necessity is substantiated and the features of state regulation of the activities of small enterprises at the regional level are considered, which made it possible to systematize the factors affecting small enterprises and divide them into internal and external, classify the factors of state influence., Taking into account the management system, frequency, nature, sphere of influence, as well as priorities, potential, functions of the state and the level of management creates the possibility of developing an optimal management decision. The developed conceptual model of the organizational and economic mechanism of state regulation of small business in the region is a system of basic interrelated elements, as well as ways of their interaction and impact on the economic and social level of small business functioning in general through a system of types of state assistance, in accordance with the target orientation, in within the framework of legal norms, reflects the subject, principles, interaction of various management bodies, structures and tools for influencing small business, unlike the existing ones, take into account the system of parameters of the work of all interested institutions in the development of management decisions.*

**Keywords:** economic mechanism, socio-economic process, small business, state regulation, principles, information support, regional level, optimization directions.

### **INTRODUCTION**

Today, considering the region as an independent socio-economic reproduction system, within a separate territory, it is necessary to highlight the specifics of territorial interests, reflecting the peculiarity of the historical and social conditions of the region, the psychology and way of life, traditions, the type of spiritual and cultural mentality, etc. Under these conditions, the territorial unit has certain advantages and develops its economy in accordance with them. And we are talking not only about the economic sphere, but also about the fact that the abilities of the entire population are manifested in the system, knowledge, competencies, skills are multiplied, transmitted from generation to generation, the general conditions of its existence are reproduced.

At the moment, the industrial potential of the Ukraine's regions is used at the level of 15-50%, and this indicates that a significant part of the businesses do not work at all. In some regions, a large number of industrial facilities with high capital and energy intensity deplete local resources as well as continue to pollute the environment. Thus, the Dnipropetrovsk region, which requires significant funds to compensate for the highest level of environmental load in the country, occupies one of the leading places in the country in terms of its contribution to the national income formation, and twelfth in its use, although this region requires much more costs than Kherson, Mykolaiv regions. The regions' social sphere found itself in the direst situation, which makes it impossible to really restrain the population impoverishment process. In addition, social and political tensions have greatly increased at the regional level.

In our opinion, today there is a need for such a mechanism of state regulation, including small business, based on which the economic management method will be optimized on the principles of economic freedom

and the necessary regulation through stimulating the financial stability growth; identifying and securing support for underdeveloped areas; promotion of stability, predictability of relations between regions and the state through the proportional distribution of labor results as well as the introduction of social standards that would guarantee equal access to public services for Ukrainian citizens, regardless of their place of residence. This will require urgent resolution of a number of issues:

firstly, the establishment of relationships between the region and the state through a clear delineation of functions and powers between central and local executive authorities and local governments, aimed at increasing the territory financial autonomy by increasing the share of budget revenues based on their own and fixed incomes. However, in order to strengthen the own revenue base of local budgets, it is necessary to introduce mechanisms for the dependence of the regional authorities economic capabilities on the efficiency of the functioning of economic entities located in the region, which will be interested in increasing the profitability of each enterprise;

secondly, the vagueness of the authorities' powers and responsibilities for the development of territorial communities, the lack of participation of the population in shaping the development of the territories in which they live, as well as public control over the efficient use of local resources. Today, none of the local governments has complete information and the state of finances, and therefore does not have the ability to manage them, and most importantly, there is no mechanism that would involve the population in the active development of their own territories development program;

Thirdly, an unsystematic approach to managing the region's potential does not contribute to the introduction of an investment-innovative development model. The source of ensuring the region's development can be the mobilization of its internal potential, in particular, the monetary savings of the region's population, in the form of investments, where part of the profit would be given to them and the rest would be sent to the local budget.

A feature of the economic systems regulation process is its conditionality by internal impulses and contradictions of economic development. However, it can also be influenced by external factors, especially in transitional periods of the society development. Each economic entity influences other entities and the economy as a whole through the manifestation of its functions. The market mechanism influence is enhanced in the context of an increase in the number of independent producers creating the same type of product, expanding the possibility of free access to various production sectors, as well as improving the mobility of production factors among industries and enterprises.

To solve the issues of the society functioning, an effective state regulation mechanism is being formed in various economic areas: price regulation for socially significant goods, the impact on business, industries through the system of public procurement, orders, credit schemes, on international trade – through import duties, export benefits for support for domestic producers and a number of others. Summarizing the considered approaches to the essence of the economic mechanism, we can conclude that the economic category under consideration is complex and multidimensional, between the components of which there are complex relationships, the nature of which, in turn, depends on the level of society development, the economic management model of historical political, international as well as other factors. The role of the economic mechanism elements, the specific forms of their combination and application are very complex and diverse. Therefore, in the process of economic mechanism reforming, it is necessary to strive for consistency and synchronization of all its components. The mechanism of organizational and economic regulation should act in this context at the same time as a connecting link, and an instrument, and a guideline for transformations.

The economic mechanism should be considered as a system of scientifically substantiated, specially developed and legislatively fixed by the state forms and methods of influencing the socio-economic society development. The economic mechanism of the economy includes:

- a system of economic laws: backbone laws (the law of saving time, the law of increasing needs, the law of development proportionality, etc.), general laws of reproduction (laws of direct production, laws of

distribution, exchange and consumption, etc.), special laws (in agriculture, the law differentiated rent, operating in agriculture, etc.);

- socio-economic relations: relations between a set of individuals in conducting economic activities to ensure living conditions (combine property relations, production relations, relations of performance results distribution);

- organizational and economic relations: the relationship between the elements of the system, determining the forms of management, role, responsibility, functions, as well as technological, economic and managerial relations between them;

- system of economic interests: unites the interests of various society groups, which are formed according to demographic, economic, psychological characteristics;

- organizational and economic mechanism of state regulation: reflects the mechanism of state influence on processes in the economic mechanism of the economy.

In the theory and practice of regionalism, considering business, it is noted that this integrated complex system of the business environment is divided into external, generally, independent of businessmen themselves, and internal, which is formed directly by businessmen.

The approach to improving the organizational and economic mechanism of small business state regulation should be based on the following principles:

- the principle of scientific validity – will involve the knowledge of the patterns of small business functioning, trends in its development;

- the principle of consistency – will allow considering small business as a complex system in accordance with the laws of its functioning;

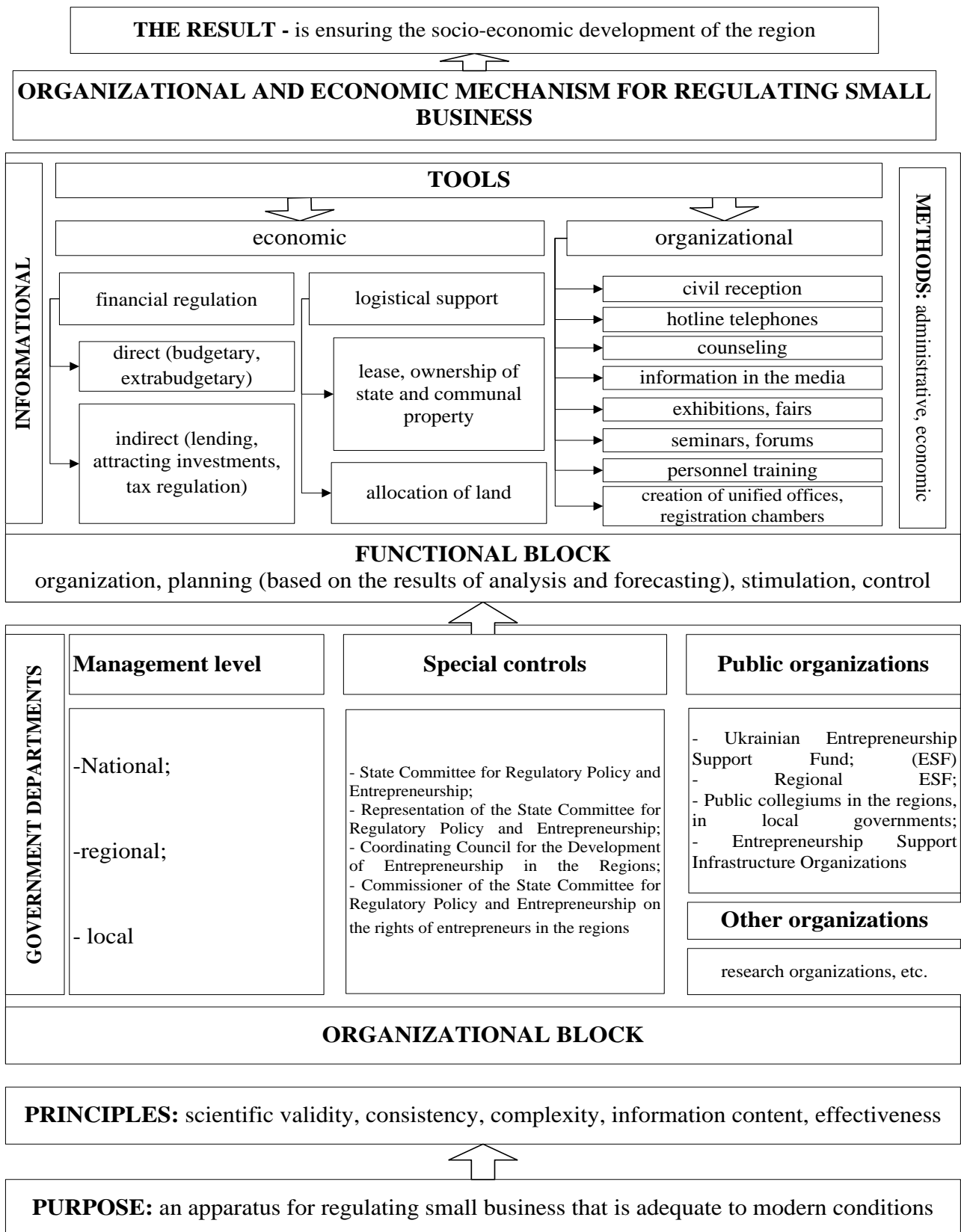
- the principle of complexity – will allow us to explore various kinds of factors in close relationship and interaction with each other;

- the principle of informativity – implies the availability of complete and reliable information, as well as the timeliness of its receipt;

- the principle of effectiveness – involves the provision of analytical results to the relevant structures in order to make a management decision, taking into account the elimination of shortcomings.

Small business is proposed to be considered as a systematic, proactive, independent activity of individuals-entrepreneurs and legal entities of any organizational and legal form as well as form of ownership, registered in the manner and in accordance with the criteria established in the country at the place of registration, which is carried out on behalf of a small business entity, at its own financial, psychological, social risks as well as under its own responsibility, in order to generate income. Unlike the existing ones, the definition takes into account the small business characteristics and features distinctive from other types of activities for the current period and does not contradict the current legislation of Ukraine: it focuses on the need to conduct activities within the legal framework and the availability of state registration, which establishes the basis for developing a scientific approach to state regulation to create favorable conditions for the small business development, including those at the regional level.

The organizational and economic mechanism of small business state regulation in the region is defined as a system of interconnected subjects and objects, operating on the basis of principles, methods and tools, as well as ways of their interaction and influence on the economic and social parameters of the small business functioning in the region as a whole through the system types of state support (financial, budgetary, tax, insurance, investment, innovation, information, personnel), in accordance with the target orientation, within the current legal framework. The proposed approach to the structure of the organizational and economic mechanism of small business state regulation in the region corresponds to the current state and, when developing approaches to its improvement, allows us to take into account the peculiarities of the functioning of all constituent elements of the organizational and economic mechanism of small business state regulation. Scheme of the organizational and economic mechanism for regulating small business in the region is filed in Figure 1.



**Fig. 1. Scheme of the organizational and economic mechanism for regulating small business in the region.**

The consequences of the small business regulation depend on the action of the levers that regulate the functioning of the economic sphere. The most significant are the economic and organizational levers of

regulation. The significance of economic levers lies in the revitalization of the economic sphere, the flexibility of the tax and financial and credit systems, the search for possible sources of financial resources for the functioning of regional programs in the field of small business, and attraction of investments into the regional economy. The importance of organizational levers is to hold seminars, trainings, civil hearings in order to bring together all interested authorities (local governments, executive authorities, science and education enterprises, scientists, business structures) to discuss prospects, problematic issues, ways of further cooperation.

The organizational and economic mechanism of state regulation of both the economy as a whole and small business in particular is the most pronounced dynamic system that implements the state economic policy, since it is directly related to the organizational structure of economic management; is carried out through the creation of appropriate governing bodies, the rational distribution of rights and responsibilities between them, the improvement of organization, the development of democratic principles.

It is possible to ensure the regulation of the small businesses activities through organizational and economic instruments of the organizational and economic mechanism for regulating small businesses in the region.

The organizational tools (levers) are widely used in the practice of state structures, including with the involvement of various public organizations interested in the small business development and support: civil receptions, hotlines are organized, consultations, seminars are held, exhibition and fair activities are conducted, etc.

The economic instruments deserve special attention. It should be borne in mind that the state is not able to fully support small business. Therefore, its task is not only to provide concrete assistance, but, first of all, to create such conditions so that small businesses can receive certain types of support from non-state structures. These include the establishment of favorable taxation conditions, lending to organizations or enterprises that provide assistance to small businesses, however, it is necessary to ensure the interconnection and interdependence of all types of support.

The development of its own competitive strategy requires fundamental knowledge from a small business entity: regulatory and legal framework; financial and economic analysis or economic and mathematical forecasting. Therefore, there is a need to seek help. In countries with developed economies, this problem is solved by creating a consulting firms network, where they not only provide the necessary assistance in assessing the financial situation, market analysis, selection of commercial contacts, resolving legal issues, preparing statutory documents, contracts, assistance in registration, development of business plans but also monitor the implementation of these recommendations. It is also necessary to introduce the practice of providing such services in the region, however, for this it is necessary to analyze the activities of firms already existing in the consulting market, which will determine their main activity. At the same time, it should be noted that the information and consulting support provided by state authorities, provided for in regional programs for the small businesses development, in practice comes down to running around the offices, due to the limited powers of civil servants with official duties.

Modern socio-economic conditions determine the need for the development and implementation of mechanisms for regulating regional systems, based on the consideration of regional characteristics, as well as the level of use of the existing potential. That is why issues related to stimulating the of small business regulation effectiveness are of particular relevance, which enable, on the one hand, to ensure the implementation of national and regional tasks of socio-economic development, and on the other hand, to ensure the effectiveness of the regional management system.

Implementing the principle of complexity in improving the organizational and economic mechanism of small business state regulation in the region, it is proposed to focus on the need to apply a unified approach to the formation of an information base and carry out a comprehensive analysis of the available data, by assessing the of small business state regulation as an assessment of the activities of the regulator itself, in relation to activities of small businesses and evaluation of regulated small businesses.

At the same time, the assessment of the regulator, in the context of this work, of state management structures, should be understood as an assessment of the likelihood of achieving the goals set, considering the influence of various factors affecting small business. The small business assessment should be carried out in relation to the compliance degree of the level of its functioning with the requirements of the development of the region as a whole. At the same time, the assessment of measures of small business state regulation in the region is determined by the level of state structures organization and the results of the small business functioning, therefore, it is necessary to determine the results of the functioning of the regulated subsystem, reflecting the degree of their compliance with the goals set as an element of the region infrastructure. To do this, it is necessary at the state level to legislatively optimally rationally distribute powers between departments regarding the collection, systematization and analysis of information, as well as to strengthen control over the provision of mandatory reporting by small businesses.

To make informed management decisions for the regulation of socio-economic processes at the regional level, it is important to evaluate its various components as criteria for the effectiveness of the functioning of the region as a whole. Small business is no exception, in assessing the functioning of the subjects of which, in our opinion, it is advisable to single out the definition of its state for a specific period of time and evaluate its contribution to the life of the region. The analyzed approaches do not consider all possible indicators characterizing the contribution of small business and its inherent characteristic components for the time period when this result was achieved, and also does not consider the contribution of small business to the ecological sphere of the region's life.

The procedure for assessing small business in the region must be carried out depending on the priority of the national policy in general, and the region in particular. In our opinion, in order to optimize management decision-making, it is advisable:

- to assess the state regulation of small business in the region,
- to evaluate the state of small business,
- to assess the contribution of small business to the socio-economic development of the region,
- to evaluate the contribution of small business to the development of a certain type of activity, form of ownership, specify the various periods of activity.

As an information base, it is necessary to use: the legislative base; operational accounting data, statistical data. In addition, the information must: characterize small business in the region, the state, and other regions; characterize the socio-economic situation of the region, the state, other regions, and the state of the environment; characterize foreign experience.

Information can be of an official and analytical nature, divided into initial and calculated. To assess the functioning of small businesses in the region, in our opinion, it is necessary to use one comprehensive indicator that combines the results and ensure the linkage of the socio-economic interests of the region with the activities of small businesses. At the same time, the importance and necessity of using this indicator is substantiated by the following: despite the versatility of an administrative-territorial unit as a socio-economic system, a certain main goal prevails, to which all its activities should be subordinated, while all other goals should follow from the main one, not contradict and not interfere with its achievement, ultimately contribute to its implementation.

Logically, generalizing complex indicators of the role of small business should be directly proportional to the number of actually operating small businesses. However, in practice this may not be present, which is important when taking managerial responses.

The difficulty of obtaining this data at the moment is associated with the imperfection of the legislation, as well as the practice of its application, when various state structures are guided by intra-departmental by-laws that contradict the acts of other departments. In addition, the legislation has now missed the need to fix the name of the type of enterprise - a small enterprise that is, unambiguously classifying the enterprise as small according to formal signs. Many indicators are not accounted for at all.

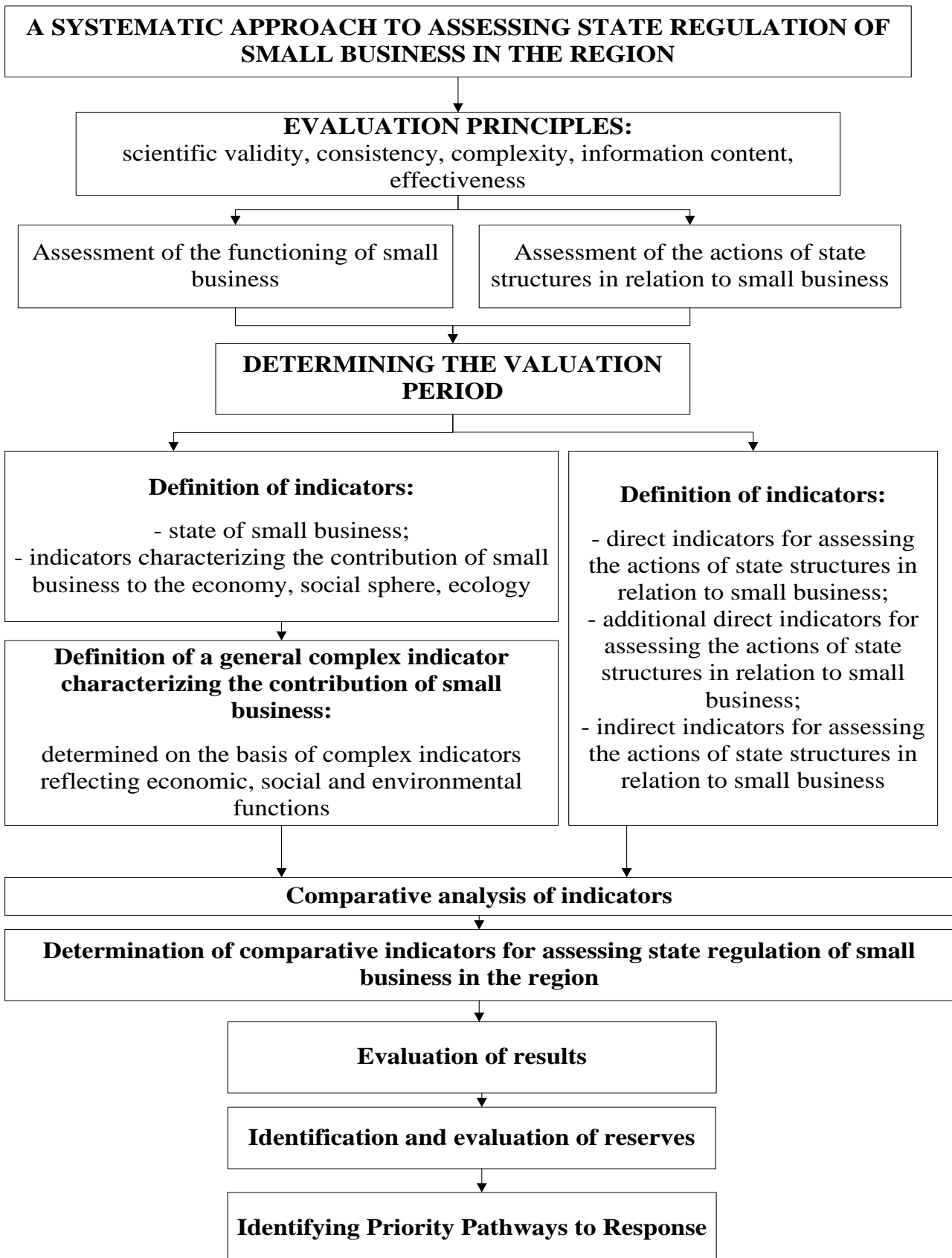


Fig. 2 An integrated approach to assessing the measures of state regulation of small business in the region



There is also the problem of summarizing information that is generated by various departments. The tax authorities have the greatest amount of information. However, there are restrictions on access to it and in most cases; information is collected systematically, only to solve a specific problem. It should also be noted that the data available in the state statistics bodies on the basis of financial statements often differ from the data of the tax inspectorate, which also leads to distortion. The data of the Pension Fund of Ukraine, the Employment Center can serve as information for estimating the number of employees. However, there is a difficulty in reliably determining the number of people employed in small business. Executive authorities that are directly involved in the development of Regional programs to support the small business development are forced to collect.

The proposed approach to assessing the state and role of small business in the region enables to fully assess small business, identify problems in development, and characterize it as the state and role of the region as a whole, and to determine the differences in the results of various fields of activity, to compare with the situation of small business in other regions, on a national and international scale, and, therefore, to make effective management decisions.

Thus, the procedure for assessing the state regulation of small business should be comprehensive, carried out from the standpoint of a systematic approach and include indicators that characterize the functioning of state structures in relation to small business and the smallest business and its contribution to various spheres of life in the region.

It should be noted that the assessment requires professional training of the user, who must fully use various assessment methods, predict the effectiveness of their application depending on the priorities set by the state, and be able to integrate the assessment process into the overall regulatory process within the legal framework. Despite the fact that the human factor is rather difficult to predict, there is a high degree of responsibility for the decision, since the process is carried out by civil servants, whose status and role are high. In addition, the active implementation of the proposed developments contributes to solving the problems of bringing the civil service system in line with the constantly changing economic conditions.

Thus, the assessment of state regulation of small business in the region must be carried out considering the influence of various factors on small business through a comparison of indicators of the state of small business and its contribution to various spheres of the region's life, as well as direct and indirect indicators of the activities of state structures in relation to small business, which enables to predict the results in a timely manner and adjust management decisions. The proposed comprehensive approach to assessing state regulation increases the flexibility, adaptability and effectiveness of small business regulation in the region.

Implementing the principles of consistency and complexity in improving the organizational and economic mechanism of state regulation of small business in the region, the need for an integrated approach to assessing the state regulation of small business in the region is substantiated, for which it is proposed to compare indicators of the state of small business and its contribution to various spheres of life in the region, with performance indicators public services in relation to small business in the region. Unlike existing approaches, it enables to evaluate the measures of state regulation of small business, including with respect to general regional development, identifying problematic issues and timely adjusting and optimizing the development of management decisions (fig. 2).

Assessment of the activities of public services in relation to small business in the region is the process of determining the result obtained in the course of the implementation of the goals and objectives by public authorities, in accordance with their competence, which enables to obtain comprehensive information on the effectiveness of the regulatory measures. The analysis of scientific works on assessing the efficiency of the civil servants` work enabled to develop indicators for assessing the performance of public services in relation to small business: direct, additional direct and indirect, which, unlike existing provisions, enables to evaluate the work of public services in a specifically chosen area of activity - the functioning of small businesses, and provide an opportunity to compare the results with the socio-economic situation of the region as a whole.

Direct indicators are quantifiable and compared with the spent resources. Additional direct indicators are indicators of the public service work quality in relation to the activities of small businesses. However, given that the relationship between the costs and the result of the public services` work may not be direct, but indirect, it is proposed to consider indirect indicators for assessing the performance of public services, which reflect the region socio-economic development as a whole and small business as its component. This group of results also includes the preventive activities of public authorities, since, as a rule, it is impossible to evaluate them in the current period. The end result of such activities is manifested only in the long term.

The proposed approach implementation to assessing the actions of public services optimizes the process of making and executing decisions, increase the efficiency of the functioning of public services and the functioning of small businesses. The assessment results serve as final indicators that focus on the main problems of state regulation of small business in the framework of the organizational and economic mechanism of small business state regulation.

By modeling the relationship between state indicators and small business contribution to the region development, as well as indirect indicators for assessing the performance of public services, it is advisable to develop a system of comparative indicators at the regional level, including an expanded list of indicators for assessing both small business state and contribution and additional specific indicators of the small business functioning, identified through practical research. At the same time, it is necessary to provide for the calculation of all indicators of the system in the context of: individuals, legal entities, considering different turnover and the number of employees, with specification by types of core activities and ownership forms. The calculation of comparative indicators enables to fully implement the proposed comprehensive approach to assessing the measures of small business state regulation, which is the basis for practical measures to optimize the functioning of the functional and information blocks of the organizational and economic mechanism of small business state regulation, in addition, it enables to find out the features and consequences of the influence of regulatory measures in the region-wide socio-economic development.

The impact of legislation on the development of small business has shown that low legislative efficiency in management is due to a number of reasons. These are unprofessionalism in initiating and developing legislative projects on economic issues, the lack of a constructive mechanism for ensuring the legislation implementation, the inability to use the legislation by economic entities, the destruction of legislation by by-laws of management structures.

However, the small business legal regulation should take place systematically, while meeting a number of requirements, namely:

- the right field should comprehensively cover the processes of small business regulation in order to exclude shadow business;
- consistency, mutual complementation and compliance with the general course of the economy, in order to eliminate contradictions among legislative acts;
- the viability of legislative acts, which exclude their unreliability;
- the reality of the provisions of legislative acts, their effectiveness, full legal force;
- include forensic examination of bills;
- consideration scientifically based recommendations on the qualification of acts.

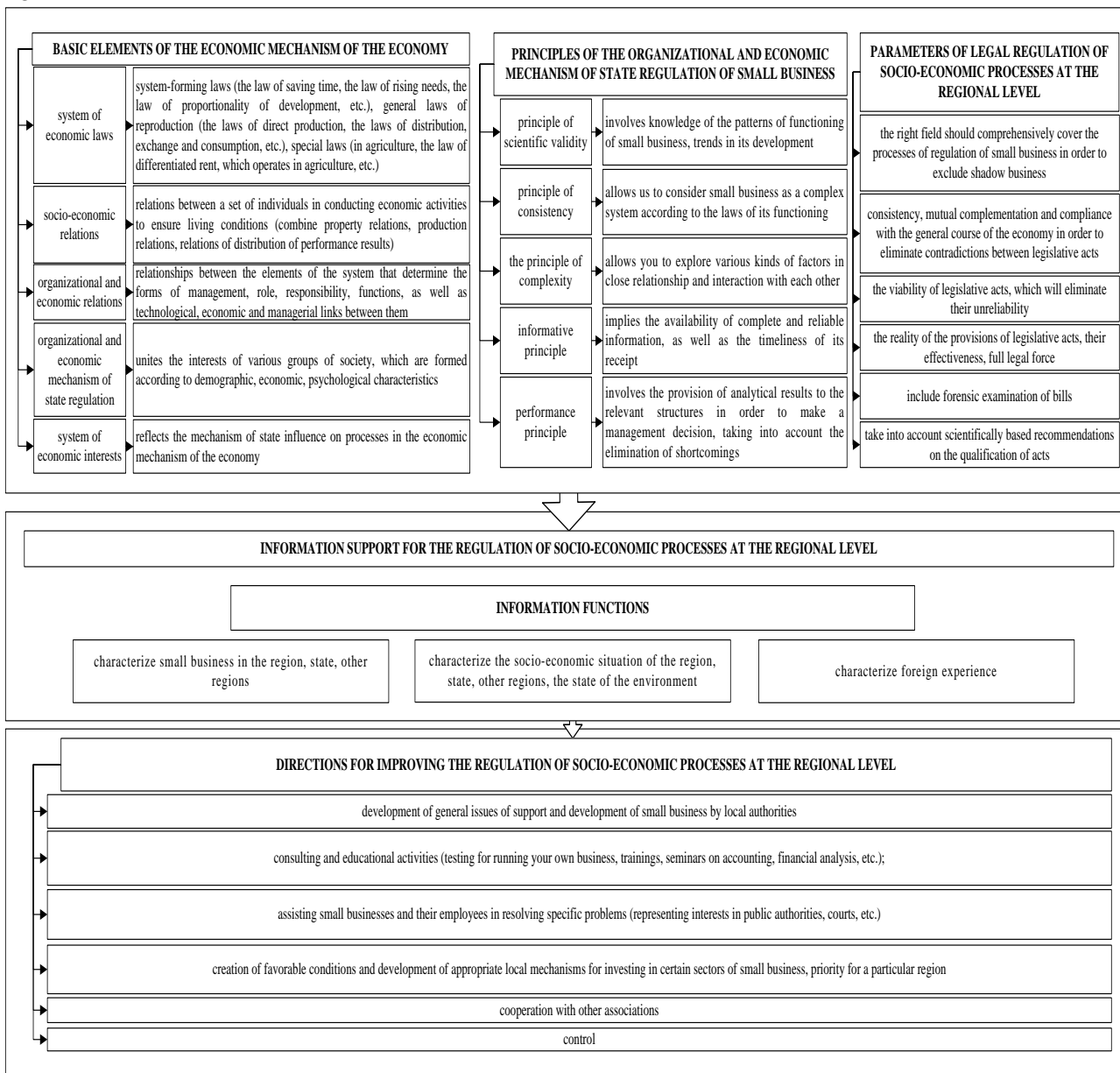
One of the important directions in creating an effective mechanism for state regulation of small business is to improve the relationship between the branches of government themselves: the legislative (local councils) and the executive (local state administrations). The most important thing is to prevent duplication of powers  $\phi$ тнтн local authorities. The division of powers should take place on the basis of economic activity.

It should be noted that both strong and weak features of the small business functioning are its independence and insubordination. As modern realities show, the lack of effective associations of entrepreneurs contributes to the growth of regional socio-economic problems. Therefore, in order to create favorable conditions for economic development, in our opinion, it is necessary to organize interaction among all interested circles in the small business development. First of all, these are small businesses themselves, which can be

united into effective regional centers. Moreover, it should be noted that there are legal entities and individuals - entrepreneurs; therefore, separation according to this principle is possible. At the same time, each independent association should take upon itself the solution of tasks in the following areas:

- development of general issues of small business support and development by local authorities;
- consulting and educational activities (testing for running one`s own business, trainings, seminars on accounting, financial analysis, etc.);
- assistance to small businesses and their employees in resolving specific problems (representation of interests in public authorities, courts, etc.);
- creation of favorable conditions and development of appropriate local mechanisms for investing in certain sectors of small business, priority for a particular region;
- cooperation with other associations;
- control.

Directions for improving the regulation of socio-economic processes at the regional level are shown in fig. 3.



**Fig. 3. Directions for improving the regulation of socio-economic processes at the regional level**

Such a variant of interaction among structures can be very effective in achieving the goal of getting the region out of difficult economic situations. Strengthening the rule of law and order in the country, increasing the effectiveness of the fight against crime, including organized forms, which include corruption, in modern conditions remains one of the main directions in the activities of state structures and society as a whole. At the same time, it is possible to gradually restore citizens' own responsibility for their economic and social status, while ensuring an appropriate level of freedom of choice for each individual.

When constructing a comprehensive indicator for assessing the small business contribution to various spheres of life in the region, it is necessary from an economic point of view to consider the indicators of contribution to the economic, social spheres and the solution of environmental problems, the need to consider possible losses from the activities of small businesses is justified, which, in contrast to existing approaches to assessment of the small business contribution provides a comprehensive identification of the parameters of the small business functioning and the degree of its influence on the solution of regional problems.

In order to ensure the development of the organizational and economic mechanism of small business state regulation in the region, it is necessary to develop reasonable proposals for the development of the proposed structural and logical model components, which create conditions for its uninterrupted functioning in modern socio-economic conditions under the influence of various factors.

Modern realities objectively confirm the need for the active functioning of the information and functional blocks in terms of internal and external control, indicate the need for practical recommendations for the development, adoption and adjustment of management decisions, using data obtained as a result of control activities, which achieve consistency and interaction in work all institutions of the organizational and economic mechanism of small business state regulation and create favorable conditions for the regional infrastructure development.

The necessity is substantiated and the features of state regulation of the small business activities, including at the regional level, are studied, which enabled to systematize the factors affecting small businesses and dividing them into internal and external, to classify the factors of state influence, considering the management system, frequency, nature, scope influence, as well as priorities, potential, state functions and the level of management, forms the possibility of developing an optimal management decision.

A conceptual model of the organizational and economic mechanism of small business state regulation in the region has been developed, which is a system of basic interconnected elements (subjects, objects, principles, methods and tools), as well as ways of their interaction and influence on the small business economic and social levels functioning in the region. In general, through a system of types of state support (financial, budgetary, tax, insurance, investment, innovation, information, personnel), according to the target orientation, within the framework of legal norms, reflects the subject area, principles, interaction of various management structures and tools to influence small business, unlike the existing ones, it considers the system of parameters for the activities of all interested institutions when developing a management decision.

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## PARADIGM OF ENERGY SECURE ECONOMY IN A TRANSNATIONAL DIMENSION

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### **ABSTRACT**

*The concept of energy security has been studied, its economic essence and difference from the concept of energy independence have been proven, according to the linguistic and economic characteristics of energy security. The historical diagram of the formation of the energy-secure economy paradigm is presented. The role and place of energy security in the economic space has been studied. Determining stages in energy security research are defined and characterized. The economic content of the determinants of influence on energy security has been studied and detailed. The risk factors of energy security according to exo- and endogenous influence are characterized. The decomposition of the architecture of the energy security mechanism is outlined, in the chain of coordination of actions the state, territory, business entities and the individual are represented.*

**Keywords:** *alternative energy sources, threats, energy resources, energy security, economic security, risks.*

### **INTRODUCTION**

The main problem of the economy in modern economic theory is the limitlessness of human needs in the context of the limited resources that can be used to satisfy them. The economic system of any country in the world works to meet the current needs of the society. The satisfaction of needs occurs through the production of goods and services, which is impossible without the use of the necessary resources. The problem is that the resources which can be used in the production process at this time are always insufficient to make such a number of goods and services that would satisfy all the needs existing in this society. Thus, the growing needs act as the driving forces of the economic development of the society. [1]

As of 2020, the world receives the most energy thanks to oil – 31%. Coal provides 27% of energy, gas – 23%, renewable energy sources and hydroelectric power plants – 5%, nuclear power plants – 5%, biofuels and waste – 10% (but here it is worth noting that this is mostly firewood burned in the furnaces of the poorest countries) [2].

The beginning of reforms in the energy sector happened in 2011 when Ukraine entered the European energy market due to the implementation of the requirements of the European Energy Society for the Ukrainian regulatory and legal framework in the field of energy. In particular, it was the formation of natural gas market (the Law of Ukraine "On the Natural Gas Market" came into force in 2015) and electricity market (the Law of Ukraine "On the Electric Energy Market" in 2017).

In 2019, Russia's hybrid aggression updated the issue of energy security and proved the need for the state regulation of energy prices (natural gas) through the introduction of the insurance price for gas. And in 2022 European countries faced with an urgent task of diversifying sources of natural gas supply.

During this time, many scientists and practitioners paid attention to the content and meaning of the concept "energy security" and determined its place in ensuring national priorities, e.g. D. Bobro, V. Brych, I. Honcharuk, L. Horal, S. Zavhorodnia, I. Pavlenko, H. Riabtzev, A. Smenkovskiy, O. Sukhodolia, Yu. Kharchishvili, A. Kharchenko, V. Shyiko and others. Some authors, e.g. I. Honcharuk, A. Deina, Yu. Dziadykevych and I. Samoilenko, associate energy security with energy independence.

The concept "energy security" in the context of economic and national security has a philosophical and economic background, as it contributes to the protection of state interests and the interests of individuals in the state, which conglomerates social, energy, military, environmental and other spheres of life.

S. Plachkova, I. Plachkov and others consider various interrelated concepts of energy security in their works [3]:

1. Energy security is the assurance that energy will be available in the quantity and quality required under given economic conditions.

2. Energy security is a state of protection of the vital "energy interests" of a person, society and the state from internal and external threats.

3. Energy security is the state of protection of the country (region), its citizens, society, the state and the economy from the threat of shortages in order to meet energy needs with economically available fuel and energy resources of acceptable quality under normal conditions and extraordinary circumstances, as well as from the threat of disruption of the stability of fuel and energy supply.

4. Energy security is a timely, complete and uninterrupted provision of fuel and energy of the necessary quality for material production, non-production sector, population, utilities and other consumers in order to avoid harmful effects on the environment.

Based on a complex approach to the definition of the concept "energy security", we will provide its interpretation given in the works of foreign scientists and prove that energy security is an economic concept that differs from the concept of energy independence in terms of its linguistic and economic characteristics.

**Table 1. The term "economic security" in the scientific works of foreign scientists**

№	Author, source	Definition
1.	Philipp Mueller [4].	a system that meets the needs of people and organizations for energy services such as heating and lighting for appliances and transportation in a reliable and cost-effective way now and in the future
2.	Barry Barton, Catherine Redgwell, Anita Ronne and Donald N. Zillman [5]	a state in which the entire population or the majority of citizens and business representatives have sufficient access to energy resources at reasonable prices, and in the foreseeable future will be free to use them without the risk of disruption of the provision of such services
3.	Theo Beal [6]	the concept of "economic security" covers a wide range of interrelated issues and elements such as investment screening, anti-coercion tools, research integrity and supply chain sustainability
4.	Žaneta Simanavičienė, Andrius Stankevičius [7]	a multidisciplinary phenomenon that should be regulated by the supreme power of law
5.	Jan Braun [8]	such a state of the economy that allows to cover current and prospective customer demand for fuel and energy
6.	Energy Strategy of Ukraine for the period until 2030 [9]	guaranteeing energy security is the achievement of a state of technically reliable, stable, economically efficient and ecologically acceptable supply of energy resources to the country's economy and social sphere, as well as the creation of conditions for the formation and implementation of the policy for protection of national interests in the field of energy
7.	Methodology for calculating the level of economic security of Ukraine [10]	such a state of the economy, which provides the protection of national interests in the energy sector from existing and potential threats of internal and external nature and makes it possible to meet the real needs for fuel and energy resources to ensure the livelihood of the population and the reliable functioning of the national economy in normal, emergency and martial law regimes
8.	World Energy Council [11]	Energy security is the assurance that energy will be available and in the quantity and quality required under certain economic conditions.
9.	International Energy Agency [12]	Energy security is an uninterrupted physical availability at an environmentally friendly price.

1600	Ernest Bord William Gray	Treatise "On the Magnet and Magnetic Bodies, and on the Great Magnet the Earth"	Generation of static electricity
1729	Stephen Gray		The phenomenon of electrostatic induction
1730-1740	Benjamin Franklin		The principle of charge conservation and the construction of an electric battery
The end of 18 <sup>th</sup> century	Luigi Galvani	Treatise on the forces of electricity during muscular movement	
	Alessandro Volta		Distinguished electric potential and electric charge; invented a source of continuous flow of electric charge
19th century	Oliver Evans	Discovery of oil displacing coal (Southern California)	High-pressure steam engine
	Vasyl Petrov		Described the phenomenon of an electric arc, obtaining different electrical voltages
	Hans Christian Ørsted		Discovered a direct connection between electricity and magnetism
	André-Marie Ampère		Developed a physical and mathematical theory, invented electromagnet and electric telegraph
	Michael Faraday		Created a dynamo machine
	Maria Skłodowska-Curie		Discovery of thorium, polonium, radium radiation. The beginning of nuclear energy
The end of 19 <sup>th</sup> century	Thomas Edison		Invented a source of electric lighting (bulb); built the first power plant
	Nicola Tesla		Invented a new type of alternating current motor and technology for transmitting electricity over long distances
			Construction of the first hydroelectric power station
1887			The first electric tram
			development of solar cells
1905	Albert Einstein	The law of photoelectric effects	
1911	Piero Ginori		The first industrial geothermal power plant
1942	Farm	«Manhattan project»	A controlled nuclear chain reaction was obtained for the first time
1954			The world's first nuclear power plant began operating
1986			Accident at the Chernobyl NPP
1990			Green energy development
1991	UN		Framework Convention on Climate Change
1997	UN	Kyoto Protocol	
2016	UN	Paris Agreement	

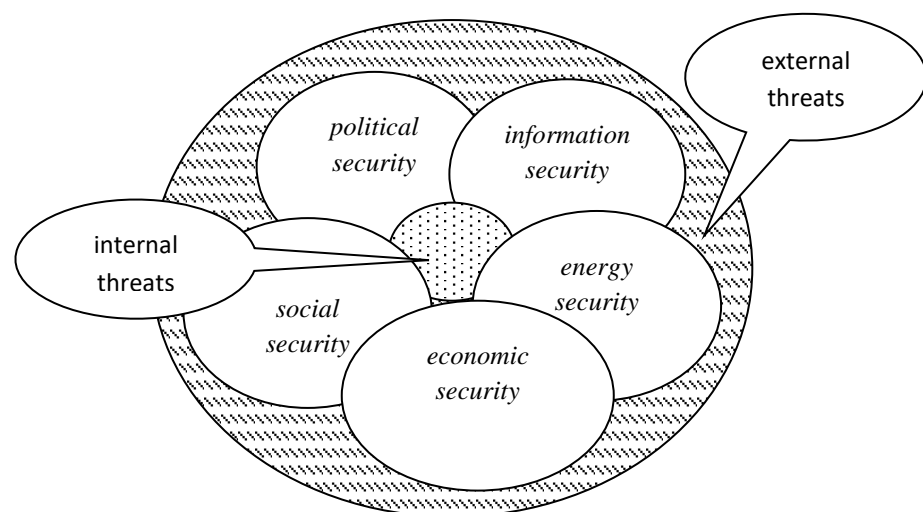
Fig. 1. Historical diagram of the formation of the energy-secure economy paradigm

Providing a brief historical overview of the development of energy as a physical phenomenon and as a science, we see (Fig. 1) that the main period of its intensive development was in the 19th and 20th centuries. The strategic vision of the issue of energy security began to take shape just before the First World War.

One of the main reasons for the transformation of energy security into a component of the national strategy was the decision of W. Churchill, who was a member of the Cabinet of Ministers responsible for the British Naval Forces at that time, to switch from the use of local coal to imported oil in 1912 [13]. But only in the middle of the 20th century, after the explosion of the atomic bomb in Hiroshima, humanity actively began to implement energy security measures: where to store nuclear waste, how to build safe facilities quickly, how not to damage the environment.

Summarizing various opinions, we emphasize that the concept of energy security includes technical, technological, safety and economic components. Therefore, we believe that economic security is a technical and economic category, the basic characteristic of which is the reliability and continuity of energy supply to consumers, in contrast to energy independence, which is based on the sources of energy supply.

Fig. 2 presents a visualization of the place of energy security in economic space.



**Fig. 2. Interrelationship of national security components**

Energy security studies involve a number of stages, such as:

- carrying out general analysis of the industry state;
- formation of the system of basic indicators that most fully characterize the industry and can reflect changes influenced by various internal and external factors;
- identification, analysis and systematization according to defining characteristics and degree of threat to energy security;
- determination of threshold values of indicators, exceeding of which leads to negative and destructive phenomena in the considered area;
- calculation of actual values of energy security indicators and their comparison with threshold values;
- determination of values of integral indicators of energy security;
- formation of recommendations and measures to prevent threats and improve energy security indicators.

The necessary level of security is achieved provided that the entire complex of indicators is within acceptable limits of their threshold values [3 Плачкова, Плачков].

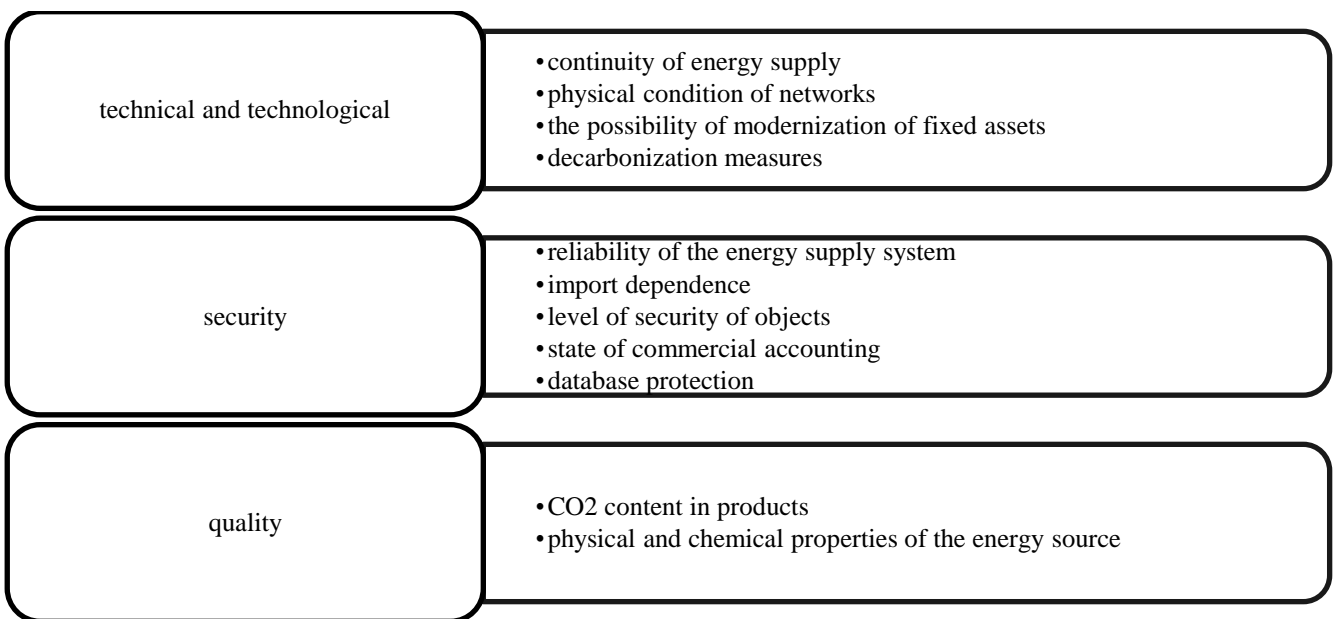
Any worldview system is based on ideas of a deterministic nature - about necessary or accidental connection of moments and phenomena of reality, possibility and probability of changes in the world, causal and non-causal factors of such changes, regular or arbitrary nature of dependencies and interactions [14]. Therefore, determinants are unique fields that cannot be seen, but they affect each element separately and the system as a whole, i.e., they appear primarily in the form of causality as a set of circumstances [15].



The low ability to predict the parameters of the development of an unstable environment formalizes the key task of the security system, namely the minimization of the negative effects of destructive influences. This makes it possible to identify the fundamental difference of the economic security system among other social and economic systems, which are characterized by resource-functional support of development processes, which refers to focusing on the design of safe conditions for the future [16]

When conducting a study of the determinants of the impact on energy security, we consider technical and technological factors, safety and quality factors to be the main ones. The details of their economic content are shown in Fig. 1.3. It should be mentioned that each of the parameters has a differentiated impact on the complex concept of energy security, due to being related to different sources of energy (electricity, natural gas, oil, petroleum products, coal). Without posing an aim to prove their discrete influence, we emphasize common factors of influence on the studied indicator, in particular, the state of networks.

When considering the fuel and energy economy of Ukraine as a single structure, according to Stepiuk M., it is possible to divide it into local systems, between which there are close external connections. Each such system performs specific functions unique to it. This kind of systems can include gas production areas, gas fields, district gas supply systems, separate main gas pipelines or groups of gas pipelines allocated to the system, underground gas storage stations (or groups of storage facilities that are part of one consumption node), compressor stations, linear sections of the main gas pipeline. The main function of the gas transportation system is the continuous supply of natural gas to the consumer, where the measure of productivity is the amount of gas transported per unit of time [17].



**Fig. 3. Determinants of energy security**

When focusing attention on the state of networks, one cannot ignore nuclear energy.

All Ukrainian nuclear power plants are concentrated in one state enterprise "State Enterprise National Nuclear Energy Generating Company "Energoatom".

SE NNEGC "Energoatom" traditionally generates more than 50% of the total electricity generated in Ukraine. The company has 4 operating nuclear power plants (Zaporizhzhia, Rivne, Pivdennoukrainsk, Khmelnytskyi), which include 15 power units with a total capacity of 13,885 MW [18].

The DTEK group of companies, which is one of the largest private energy companies in Ukraine, plays an important role in the energy sector. DTEK plays a leading role in the electricity and heat generation market. The main production functions of DTEK are mining and preparation of coal, generation of electricity at CHPPs and TPPs, distribution of electricity, development of alternative energy sources. In addition, the

DTEK group of companies is the largest production enterprise in the country. They own 8 coal mining enterprises (in 2019, the company's production amounted to 24 511 thousand tons) [19]

In the field of gas production, DTEK Oil&Gas has a 40% share of production among private companies (in 2019, the company produced 1.66 bcm of gas) [19].

As for NJSC Naftogaz of Ukraine, this group of companies is the largest gas and oil producer in Ukraine. In addition, the company is engaged in the distribution and supply of natural gas to the population, and also supplies natural gas to district heating companies under special obligations (PSO) in the gas market. In 2020, Ukraine produced 20.2 bcm of gas, of which state-owned companies produced 15.3 bcm (76%) and private companies 4.9 bcm (24%). The vast majority of gas was produced by JSC UkrGazVydobuvannya (14.9 bcm), a subsidiary of NJSC Naftogaz [20]. Another subsidiary of Naftogaz is PJSC Ukrnafta, which is the leader in oil production in Ukraine. Together with JSC UkrGazVydobuvannya, PJSC Ukrnafta produced almost 90% of all oil produced in the country in 2019 [21].

JSC Ukrtransgaz and JSC Ukrtransnafta are engaged in the storage and transportation of natural gas and oil. It should be noted that the physical deterioration of gas and oil transportation and gas distribution networks is 45% and 37% respectively at the beginning of 2022. The average service life of main oil pipelines is more than 28 years, and the first built oil pipelines have been operating for more than 40 years. During operation, part of the main oil pipelines and technological equipment (up to 70%) has exhausted its resource, is physically and morally obsolete and requires modernization.

The specified periods of operation of oil pipelines require significant investments (at least UAH 500 million annually) to maintain them in good technical condition, carry out current and capital repairs, introduce measures related to equipment modernization and reconstruction. It is necessary to upgrade the existing oil pipeline system to a state that will meet international standards, which involves the introduction of new technologies and equipment [22]. As for the continuity of power supply, "the most illustrative in terms of managing the reliability of power supply based on economic and administrative methods is the experience of the United States, where the mechanism of managing the reliability of power supply is based on three components:

- 1) damage to the country's economy from unreliable power supply;
- 2) the cost of reliability at the current time;
- 3) reliability from the consumer's point of view and management of emerging risks for enterprises - clients of electricity supply companies» [23].

In the conditions of intensive development of gas markets, the problem of ensuring the reliability and efficiency of the gas transportation system is extremely relevant. It can be solved by constant maintenance of facilities in proper functional condition. That, in turn, requires timely and full funding. However, the realization of this potential is hindered by the complex geological conditions of the projected hydrocarbon reserves, and therefore the need for significant investments for their development. At present, most of the fixed assets in the fuel and energy complex are worn out and inefficient, which leads to fuel overconsumption, reduced operating capacity and deterioration of environmental performance.

The level of reliability of power supply systems is usually assessed by an extensive system of indicators, in particular by the probability of failure-free operation during a certain period of time. However, statistics on "rolling blackouts" and probable full blackout prove that the most correct and universal criterion is the financial result (loss) from social and economic (property) consequences.

We support Serdiuk B. and Lishchuk A. in their statement that "...it is quite difficult to establish a specific amount of economic damage, but there is a number of objective factors, the characteristics of which in relation to a particular consumer can be used to measure the level of damage caused to him due to the interruption of services».

In the context of uneven distribution of energy resources and their limited availability, it is quite natural that energy security problems arise in resource-poor countries [24]. Analyzing the definition of "energy security", it is necessary to emphasize the threats inherent in it. Okhrimenko O. O. and Bigun U. V. distinguish

internal threats: insufficient provision with fossil resources, irrational use of energy carriers, which leads to their deficit; unsatisfactory technical condition of fixed assets, threats of accidents and terrorism at FEC facilities; social tension caused by rising prices of energy carriers and high accident rate at FEC enterprises; shortcomings of the state energy policy and external threats: unfavourable market conditions; large-scale accidents at FEC facilities, greenhouse gas emissions; contradictions in the geopolitical interests of countries; lack of well-thought-out diversification among energy suppliers; political instability and military conflicts in the areas of energy resources concentration. Table 2 summarizes energy security risk factors by exogenous and endogenous impact.

**Table 2. External and internal risk factors of energy security**

Geopolitical environment of external risk factors, challenges and potential threats in the energy sector	Potential internal risks and internal crises in the energy sector
Energy pressure, blockade and other hostile economic phenomena	Employment, scale of production and reduction of national product output to a critical level
Industry dependence on one energy source	Industrial and technological underdevelopment
Capital investments for political purposes: national energy industry and oil and gas complex, financial and credit institutions, critical communications (pipelines, tank farms, terminals), property or control of takeover management	Economic criminalization; uncontrolled scale of economic crimes
Energy dependence on one country or one group of national resources	Crisis of the banking financial system and financial panic

*Source: created by the author based on [7].*

Goncharuk I. names the following factors of negative impact on energy security: low level of investment in all sectors of the fuel and energy complex; excessive politicization of the energy sector; imperfect pricing, tax and tariff policies of the state in the energy sector; lack of a competitive energy market and appropriate market infrastructure; monopoly pricing of energy carriers and determination of the terms of their supply; deformation of the structure of production and energy consumption; crisis in the management of strategic energy reserves; progressive lag in the development of the raw material base of the extractive industries of the fuel and energy complex, in particular, gas and oil.

Competitiveness can lead to threats to economic security, so it is important to investigate the possibility of such threats and their impact on the country's competitiveness.

Taking into account that the country has been in an undeclared war for 8 years, and its hot phase began in 2022, the main threat to Ukraine's energy security is Russia's military aggression with accompanying cyber threats and physical threats to energy facilities.

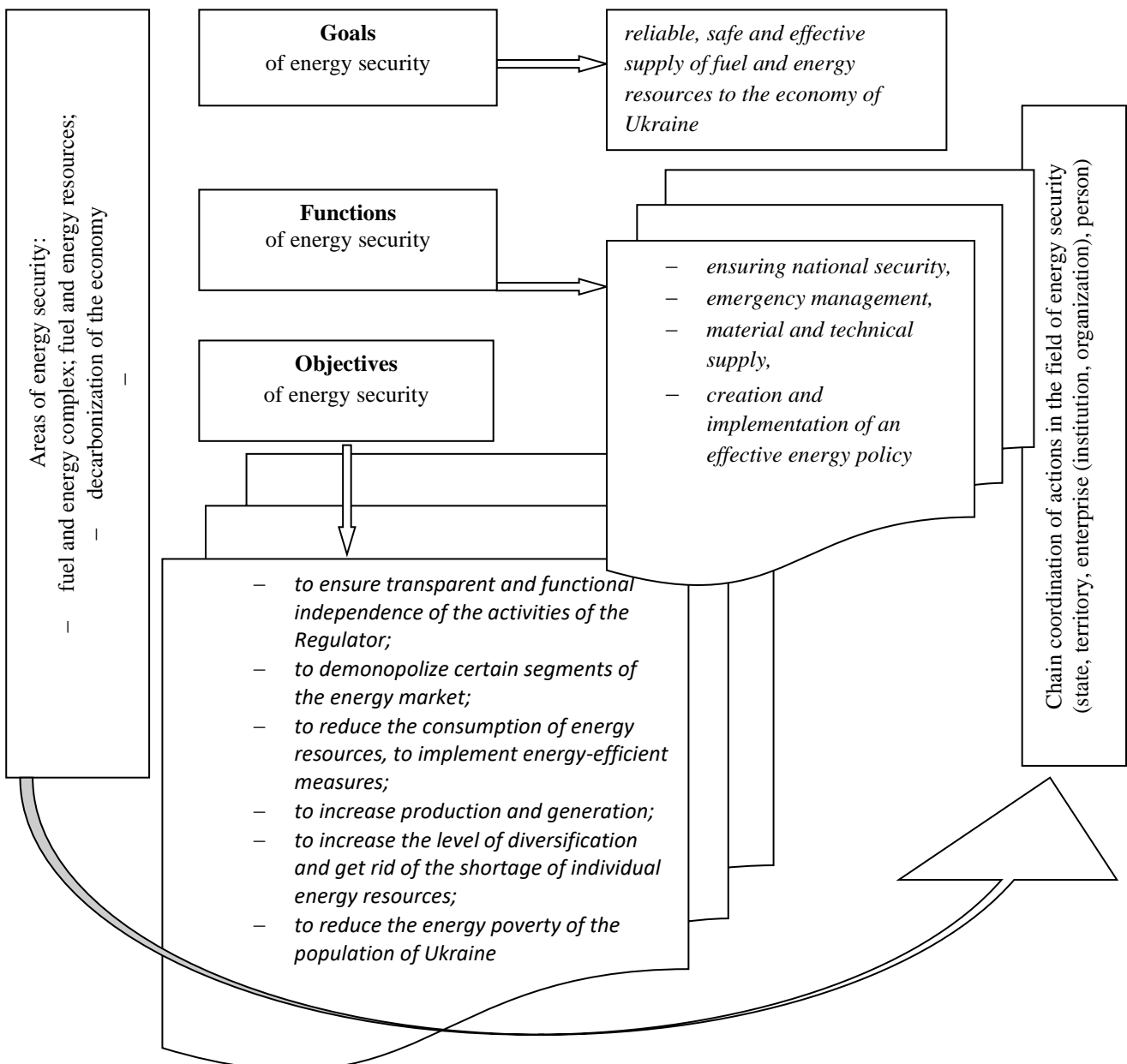
The European Strategy for Sustainable, Competitive and Secure Energy (2006) provides a list of threats to European energy security. However, the above list should be supplemented by such threats as shadowing of economic relations in the energy market, arbitrary (uncoordinated) changes in the structure of energy generation capacities, high energy consumption of the economy, high level of monopolization of the energy market.

The level of Ukraine's shadow economy was 31% of GDP based on the results of three quarters of 2021 (report of the Ministry of Economy). In the transport sector it was 44%, in the processing industry - 26%, in the extractive industry - 31% [25].

Classical political economy argued that the national economy is capable of self-regulation and full use of its own resources. J. Keynes proved a new paradigm of national economic security, which consisted in

state intervention in the functioning of the market economy through the use of fiscal and monetary policy. Hernando de Soto gave the priority status to the institutional theory among other economic theories, as it is a paradigm that distinguishes economic institutions and determines their impact on the development of competitive relations. It is difficult to overestimate the importance of de Soto's ideas for understanding the processes that take place in Ukraine: the development of informal business should be seen as a symptom of economic recovery. The problem is not how to "stop" shadow economic activity, but how to achieve its formalization [26].

With the establishment of the era of globalization, the paradigmatic dialectical contradiction is manifested, on the one hand, in the rapid development of liberalization and integration processes that lead to the openness and interdependence of economies or the development of the global market, in which the economic isolationism of individual states has no sense; and on the other hand, there is the problem of self-preservation and development of individual states, their economic self-advancement in the international arena [27].



**Fig. 4. Decomposition of the energy security mechanism architecture**

Kulinska A. V. emphasizes that the system-process approach allowed to form the appropriate methodological tools for analysis, that is, to create a separate sub-branch of economic research that is a science that studies the theoretical and methodological foundations of national economic security of the state and is called «ecosestate» [28].

It is impossible to change the paradigm of energy development without solving complex scientific and technical problems and spending huge material resources, which will require greater openness and freedom of information flows along with technology and money [29]. Strategic goals and initial resource potential of the state determine the structure of the economic security system, its functional components, a set of indicators for assessing its level, mechanisms and means of strengthening economic security. A qualitative property of an effective security system is its ability to evolve in accordance with changes in challenges, threats and priorities in a particular period of time. It is impossible to achieve an absolute state of security and to completely negate the destabilizing impact of threats. However, this is not an evidence of functional limitations or failure of the economic security system of the state. The processes of functioning, development and progressive change inevitably produce destabilizing influences. Thus, absolute security can be achieved only in a state of calm, which is not characterized by any processes of interaction, which is a priori impossible given the absence of closed economic systems. [30]

As we mentioned above, ensuring national security is inextricably linked to energy security. However, those theoretical and methodological statements and proposals that outline the current level of this issue sometimes miss certain aspects of the formation of a four-level energy security management system (macro-, meso-, micro- and nano-level).

Taking into account the emergence of united territorial communities in the state administration structure and implementing the policy of energy saving from the state to an individual, the specification of the formation of the main energy security management paradigm can be interpreted as a worldview philosophy that forms the sustainable development of territories based on scientific and technical processes of quality energy management.

Fig. 4 shows the decomposition of architecture of the energy security mechanism. In the chain of actions coordination in the field of energy security, there are the state - territories - business entities - a person.

The main criteria that will characterize the achievement of the set goals can be the effectiveness indicators of Ukraine's Energy Strategy [31].

Focusing attention on the main tasks of energy security, it is necessary to highlight the priority ones. In particular, these are

- revitalization of the oil refining industry and its facilities;
- decarbonization of energy sector enterprises;
- new technologies in the oil and gas complex, based on the latest scientific and technical developments;
- implementation of the reverse energy supply possibility from European countries;
- usage of reserve capacities of the oil and gas base as a hydrocarbon hub;
- state support of business in the field of energy through risk insurance;
- personnel training on the latest educational platforms.

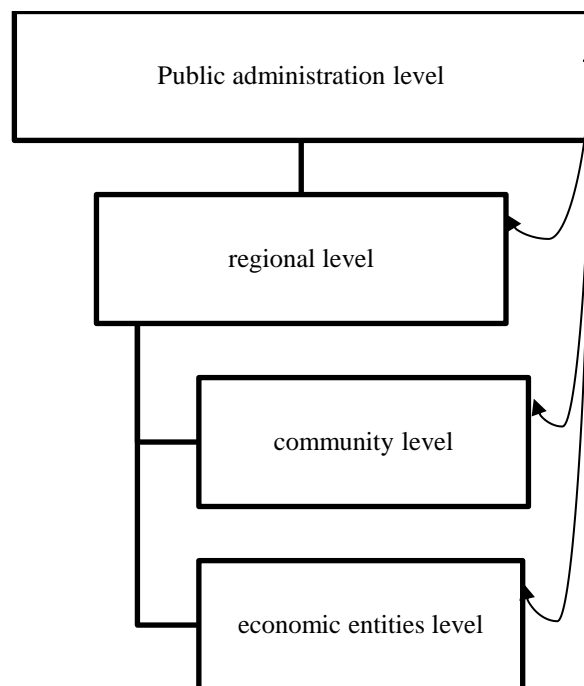
In the energy sector, there is an extensive management system, which contains a large number of vertical and horizontal connections, which requires significant flexibility and the possibility of changes. Exogenous and endogenous influences are present in the activity of every open system, the development vectors of which are discrete. The formation of a multi-level hierarchy of energy security management allows ensuring the maximum efficiency of the energy supply system, which will be proved by us in the subsequent sections of this paper.

The formation of the structure of the state's economic security system is influenced by both internal initial parameters that determine its resource and functional potential and external factors that are poorly controlled and predictable. The latter depend not only on economic, but also on geopolitical influences that are beyond the control of the economic laws [32].

We believe that the management of energy security in Ukraine has the following structure, which is shown in Fig. 5 and which is logically related to the goal hierarchy, which is the decomposition of higher-level goals into lower-level goals.

The four-level management hierarchy is headed by state-level authorities. The Cabinet of Ministers of Ukraine initiated and implemented the reform of the energy industry with the aim of implementing EU norms and standards into the legislation of Ukraine.

Ministry of Energy, Ministry of Environmental Protection and Natural Resources of Ukraine, Ministry of Development of Communities and Territories of Ukraine, Ministry of Economic Development, Trade and Agriculture, Ministry of Finance of Ukraine, State Geology and Subsoil Service of Ukraine, State Agency for Energy Efficiency and Energy Saving of Ukraine, "Naftogaz of Ukraine", NAEC "Energoatom", NEC "Ukrenergo", PJSC "Ukrhydroenergo" and the Office of Reforms of the CMU form the highest level of management of the state's energy security. Their decisions and efforts to "reform the energy sector are aimed at bringing the energy complex to a fundamentally new, high-quality level of development, bringing it into line with EU norms and standards, liberalizing and forming full-fledged natural gas and electricity markets with transparent and competitive pricing and proper vulnerable consumers protection. These actions are also designed to optimize the energy balance and increase economic, energy and environmental security, especially in conditions of external aggression. The main goal of these transformations is to strengthen Ukraine's energy security, reliably meet the needs of society and the economy in fuel and energy resources, and create a solid foundation for the country's sustainable energy future." [33].



**Fig. 5. Hierarchy of energy security management**

In his study on the issue of a new definition of security R. Ullman distinguishes two types of restrictions in the energy resources supply: 1) a non-renewable resource becomes scarce as a result of natural depletion, 2) the supply is limited by artificial government measures, for example, boycotts, embargoes or cartel agreements [34].

The main subject in the hierarchy of security management at the regional level includes state authorities that carry out the management process via the specific functions implementation through the legislative, executive and judicial branches of government. In addition, it is vital for the economy and the population of a region to have a coherent and clear coordination of the actions of the specified authorities [35]. Therefore,

the regional level of energy security management includes the functions of the United Territorial Communities (UTCs) and economic entities, which carry out inter-objective interaction, while contributing to increasing the level of energy security, provision of fuel and energy resources, stable and balanced energy consumption.

The process of forming regional energy policy (and, therefore, energy security) consists of several stages. At the first stage, energy potential is formed. Taking into account the demand and supply of economic entities at the micro-, meso- and macro-levels, the assessment of the energy resources potential is carried out from the point of view of compliance with the interests of energy policy participants. At the second stage, favorable conditions are created for the energy potential to be used within the specified time. At the third stage, the effectiveness of the used energy potential is assessed for all participants in the energy policy [36].

While maintaining autonomy in decision-making at the level of UTCs, energy security management is reduced to such forms as activities to ensure an energy-independent community and adaptation and response to climate change. The reflection of state programs on energy efficiency, energy saving and energy saving in the strategic and annual plans of UTCs will contribute to changing the behavior of the population in the economical use of energy sources and increasing the efficiency of a community. In particular, this will contribute to the reduction of heat consumption in communal facilities at minimal costs, the provision of buildings and structures with alternative sources of energy (including during emergency situations), and the formation of a resources strategic reserves for heating systems.

These should be considered as the main characteristics of energy resources effective management:

- energy saving as a characteristic of the behavioral and technical policy of ensuring energy security within the implementation framework of the subjects social responsibility;
- energy efficiency as a characteristic of the economic policy of ensuring optimal energy intensity and energy consumption of production systems;
- energy competitiveness as a characteristic of the region's energy resources political regulation.

As O. Sukhodolia and co-authors note, the vast majority of research on the assessment of the energy security state is carried out using an integrated approach. The problem of its application is the rather arbitrary selection of groups of parameters, which, according to the researcher, are important for the analysis. The use of a complex approach does not make it possible to develop a universal method for choosing energy security assessment parameters for different countries and the specific conditions of their energy markets functioning.

Moreover, the use of such an approach does not allow for strategizing in the field of energy security, since changes during the selection of a set of parameters due to technological transformations and changes in energy market models actually lead to the need to review the methodology for assessing the energy security level, the selection of modern assessment indicators, and the search for new data for calculations [37], which we will offer in the future.

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## IMPROVEMENT OF A MANAGEMENT MECHANISM IN THE AREA OF AGRICULTURAL PRODUCTION UNDER GLOBAL WARMING

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### **ABSTRACT**

*Radical warming in all the regions of the globe is a current challenge for humanity and a topical problem of the international policies aimed to reduce a negative impact of climate change on efficiency of agricultural production. It was established that air temperature in the territory of Ukraine is sharply increasing, exceeding the global indexes twice. Over the past 30 years there has been a rise in the cases of extreme temperatures and the amount of intensive precipitation causing a deterioration in soil quality, early maturation and a reduction in the level of productivity of agricultural crops. Therefore, under conditions of a negative impact of climate factors on the environment, development of adaptive technologies for agriculture becomes especially topical. The dynamics of temperature and precipitation measured for many years allowed identifying negative changes concerning an increase in the average annual temperatures by 1.0–1.1 °C and a reduction in the amount of precipitation to 70 mm per year causing a rise in the level of heat supply for soil, increased biological activity of soil, mineralization, a higher rate of decomposition of organic matter, a drop in moisture supply for soil. Under conditions of precipitation deficiency in the zone of the Southern Steppe, there were ineffective local rainfalls in the summer, their amount exceeding normative indexes per month, contributing to dehumification of farmlands, nitrogen, phosphorous and potassium losses. Natural meteorological disasters such as strong winds and sandstorms caused the development of erosion processes and more intensive soil erosion. The average annual humus losses caused by erosion processes equaled 1.38 t/ha. The complex evaluation of soil fertility in terms of humus, phosphorous, potassium, zinc, manganese and copper contents allowed establishing that soils in the Steppe zone belong to the 4th grade of satisfactory quality. There is an increase in the level of grain crop productivity due to extension of the crop acreage, causing extension of the acreage of arable lands in the Steppe zone. With regard to a negative impact of global climate change on agro-chemical soil indexes being major elements of increasing economic efficiency of agricultural production, development of a new management strategy was suggested for agricultural enterprises based on the system of digital agriculture, implementation of legume crops in crop rotation, use of treated waste water as an alternative source of irrigation, increased moisture supply for soil due to artificial and natural soil cover, planting windbreaks, a reduction in arable territories.*

**Keywords:** *climate change, moisture deficit, economic efficiency, evaluation of soil quality, soil degradation, adaptive measures, management of agricultural enterprises.*

### **INTRODUCTION**

Global climate change, caused by a long-term systematic anthropogenic impact on the environment has become a major international scientific-technological and ecological problem of the modern society. An increase in the average annual temperature started in 1880 by 0.93 °C, causing radical warming in the global climate system [1].

In the 80's of the 20<sup>th</sup> century an increase in air temperature became widespread, there was a rise in the level of the world sea, circulation of air mass changed, the number of hydro-meteorological disasters such as droughts, floods, typhoons and sandstorms increased. The main reasons of global warming are increased concentration of greenhouse gases, a change in chemical composition of atmospheric air, disruption of heat balance in the depth of water bodies and absorption of solar radiation [2].

The main index in the evaluation of climate change is average air temperature. The territory of Ukraine is vulnerable to climate change, the rate of an increase in air temperature is high, exceeding the average global indexes twice. Due to the fact that over the past 30 years climate change has been caused by anthropogenic factors, there is regularity in extreme air temperatures and the amount of intensive precipitation that causes degradation of soil quality, a fall in the level of productivity of agricultural crops and profitability of agricultural production in the territory of Ukraine [3].

Since 1991 each next decade was warmer than the previous one by 0.5 °C in 1991–2000, by 1.2 °C in 2001–2010 and by 1.7 °C in 2011–2019 [4]. An increase in air temperature causes extension of the areas with moisture deficit and reduces the amount of effective precipitation, which is a limiting factor of soil fertility and the volume of production of agricultural crops.

Under conditions of unpredictable global climate change, it is necessary to conduct thorough research on regularities of space-time distribution of climate indexes affecting the time of planning field work and development of soil degradation processes in order to farm efficiently. In addition, adaptation of the agrarian sector to new climate conditions on the basis of using alternative sources of water resources for irrigation, breeding drought-resistant species of agricultural crops, enrichment of soil with nutrients due to the use of perennial grasses and green manure to crop rotation are also important.

### ANALYSIS OF THE RECENT RESEARCH AND PUBLICATIONS

The issue of global climate change is discussed in the national and foreign scientific works. The studies are aimed at identifying reasons of climate change as an irreversible process, its impact on agro-chemical condition of soils and productivity of agricultural crops. According to the scientific studies, the main reason of a change in climate indexes is an increase in the amount of greenhouse gases, mostly, of carbon dioxide. However, the researchers' findings [4, 5] confirmed a positive effect of an increase in CO<sub>2</sub> on productivity of agricultural crops due to stimulation of the process of photosynthesis, a reduction in transpiration and efficient moisture absorption by plants. But, under conditions of regional climate change, scientists suggest performing analysis of space-time distribution of temperature and precipitation, since an increase in the recurrence of dry years has a negative effect on qualitative soil indexes and profitability of agricultural production [1, 2].

Kryvoshein O.O. [6], Dmytrenko V.P. [7] emphasized that the level of productivity of agricultural crops depends on abiotic and anthropogenic factors affecting weather conditions of the environment.

The research by Diedov O.V. [8] establishes that hydro-meteorological processes play an important role in soil formation due to decomposition of plant residues participating in humification. A thermal index is an important index of impact on chemical condition of soil determining the rate and volumes of humus formation, evaporation, mineralization and migration of humus substances.

Stepanenko S.M. [9] focuses on the problem of an increase in the amount of precipitation by 2.3 % and temperature causing a deterioration in moisture supply for plants and soils.

The necessity of applying adaptive technologies for growing agricultural crops was approved on the basis of the forecasts of the Intergovernmental group of experts in climate change, since under conditions of an increase in air temperature by 2°C there is a fall in wheat, corn, soybean and rice productivity, a reduction in the total supply of water resources and intensification of food insecurity on a global scale [3].

Food and Agriculture Organization of the United Nations with the International Institute of Applied Systems Analysis suggested performing quantitative evaluation of farmland productivity using the method of agro-ecological zoning taking into consideration climate indexes and soil conditions.

Main purpose of the chapter – development of theoretical-methodological foundations of improvement of the mechanism of agricultural management under global climate change.

### RESULTS AND DISCUSSIONS

The methods of structural-systemic analysis, synthesis and structural-logical generalization were a methodological basis of the research. The statistical data and results of seven five-year tours of observations – from the 5<sup>th</sup> tour (1986–1990) to the 10<sup>th</sup> tour (2011–2015) – were an informational basis of the research [10]. Agrochemical condition of soils in the Steppe zone was determined by means of the integral index of soil fertility in terms of the content of macro- and micro-elements with the formula [11]:

$$B_n = \frac{X}{A} * 100, \quad (1)$$

where  $B_n$  – index of soil fertility;

$X$  – factual value of each agrochemical index, mg/kg;

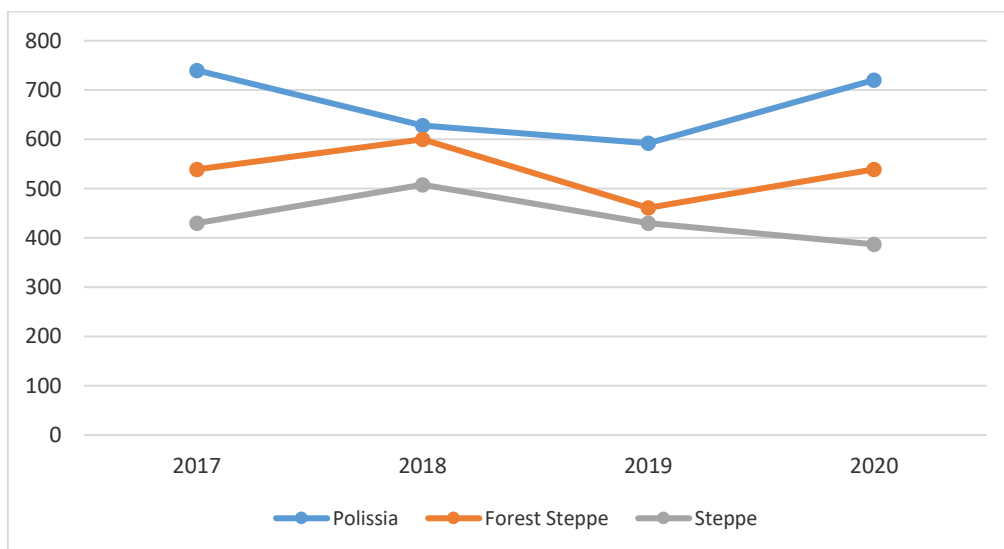
$A$  – optimal value of an agrochemical index, mg/kg.

Normative values of agrochemical indexes were used from the State Standards of Ukraine 4362:2004 «Soil quality. Indexes of soil fertility».

Agrochemical evaluation of farmlands was performed taking into consideration climate factors. The level of land usability for agricultural production was determined on the basis of a classification scale for soil quality [12].

The Steppe zone of Ukraine is characterized by dry climate and the degree days of 3200–3400 °C, that is characteristic of subtropical territories. Climate conditions are characterized by mild winter, hot and long summer with strong winds and frequent dry hot winds. The main role in the formation of annual climate indexes is played by thermal conditions. Temperature regime is determined by the specificity of atmospheric circulation, radiation factors and the nature of geological substrate. The amplitude of absolute temperatures equals 72 °C. An increase in air temperature by 1 °C causes a reduction in the area of the territory of sufficient moisture (Polissia and the western part of the Forest Steppe) and its transition to the zone of unsteady moisture, even if there is an increase in the average annual precipitation (Figure 1) [4].

An intensive increase in heat resources and a fall in the amount of precipitation in the Steppe Zone of Ukraine located in the sea coast climate sub-zone causes climate instability of the territory resulting in a reduction in the soil quality and the level of productivity of agricultural crops.



**Fig. 1. Dynamics of the average annual distribution of precipitation in climate zones**

The multi-year research on distribution of the average annual temperature and the amount of precipitation allowed establishing an increase in aridity of farmlands. The dynamics of the multi-year indexes of temperature and precipitation allowed identifying negative changes concerning an increase in the average annual temperature and a lower level of precipitation. The average annual temperature rose by 1.0–1.1 °C, the amount of precipitation fell by 70 mm per year.

An increase in air temperature against a background of less precipitation affected a change in the degree days, absolute and relative air humidity manifesting itself in the changes in seasonal meteo-climate transitions, in seasonal changes in soil moisture and evaporation. An increase in heat supply for soils contributes to intensification of biological soil activity, mineralization, a higher rate of decomposition of organic compounds.

Moisture is an important ecological factor of the environment affecting soil quality and productivity of agricultural crops. The amount of available moisture for plants depends on seasonal distribution of precipitation, evaporation and formation of surface runoff. Soil moisture is an indicator of productivity of agricultural crops affecting the processes of transpiration and plant growth. Unsteady snow cover, unfavorable conditions of meltwater infiltration, intensive snowmelt, availability of ice layers cause a reduction in the content of moisture in the soils of the Steppe zone of Ukraine. The problem of moisture supply for soils becomes more complicated since 70 % of precipitation falls during a warm period (Table 1), which is characterized by intensive evaporation of soil moisture.

**Table 1. Distribution of precipitation in the climate zones of Ukraine by seasons**

Agro-climatic zones	Cooling degree days(November 2018 – March 2019), mm		Heating degree days (April–October 2019), mm	
	Norm	Fact	Norm	Fact
Steppe	196	189	304	288
Forest Steppe	200	187	413	308
Polissia	212	191	473	413

Source: [3].

In 2019 the amount of precipitation during cold and warm periods of the year in the Steppe zone of Ukraine was less by 3-5 % than the climate normal. Under conditions of precipitation deficiency, in the research zone, there were ineffective local rainfalls, the amount of which exceeded the normative indexes per month. There is a share of intensive rainfall in the summer, being 61 %. Intensive rainfalls cause formation of intense surface runoff, washing out the upper fertile layer of soil.

An increase in air temperature has an impact on moisture supply for soils. Moisture deficit in the territory under study equaled 460 mm in 2019 by the value of climate balance, determined as the difference between the amount of precipitation and potential total evaporation. Under global climate change, in the territory of the Steppe zone, there are natural meteorological disasters such as hail, strong winds and sand storms. Dangerous meteorological conditions result in the development of water and wind erosion, dehumification of farmlands, losses of nitrogen, phosphorous, potassium and other nutrients [13-15]. The average annual losses of humus as a result of erosion processes equal 1.38 t/ha, causing a reduction in the level of productivity of grain crops to 50 % [10].

The content of humus has space-time distribution related to soil genesis. Over the past 30 years the content of humus in the Steppe zone has fallen by 35 %. The structure and water-air regime of soil deteriorates, the level of soil moisture declines by 22 % and potential productivity of grain crops drops by 0.5–2 c/ha because a humus horizon is washed out [8]. According to the data of the 10<sup>th</sup> tour of observations, 54 % of farmlands in the Steppe zone is characterized by a medium humus content, 50% is characterized by a high content of potassium, 26 % of farmlands has an increased content of phosphorous. High supply of macro-elements in soils in the territory under study is explained by exchange processes under conditions of increased heat supply. According to agrochemical certification, 50 % of farmlands is referred to the 12<sup>th</sup> grade of low soil quality.

Integral evaluation of soil fertility in terms of the content of humus, phosphorous, potassium, zinc, manganese and copper made 61 points taking into consideration the correction factor of climate (0.68) – 41.4 points. According to the classification scale of quality, soils in the Steppe zone are referred to the 6<sup>th</sup> grade of satisfactory quality.

Widespread varieties in the Steppe zone are winter wheat, sunflower, rice and barley occupying large areas of farmlands and characterized by a low level of involvement of material and human resources. Plant products occupied 77.3 % in the general structure of agricultural production in 2020, that is by 13.4 % more than in the past 10 years. The average annual increase in temperature contributes to timely maturation, less risks of freeze damage to plants. Continuation of a growing season of agricultural crops under conditions of sufficient irrigation and additional application of biological fertilizers allows double cropping. However, extreme air temperatures cause a reduction in the supply of productive moisture for soil and nutrient content, resulting in extension of the acreage of grain crops and the acreage of arable lands grows.

It is expected that the volumes of greenhouse gas emissions will have increased by 90 % by 2030. The average annual temperature will have reached 1.5 °C, causing irreversible changes in natural ecosystems, water scarcity, intensification of food insecurity, a reduction in productivity of agricultural crops. Efficiency of agricultural production is determined by natural-climatic conditions having significant space-time dynamics of meteorological elements. Therefore, the agrarian sector of economy is characterized by a high level of riskiness, related to the dependence of productivity of agricultural crops on climate. A change in climate indexes and extreme weather conditions cause financial losses and a reduction in economic efficiency of agricultural production. The International Financial Corporation (IFC) established that natural disasters have resulted in the losses of more than \$2 billion in the agrarian sector over the past 20 years.

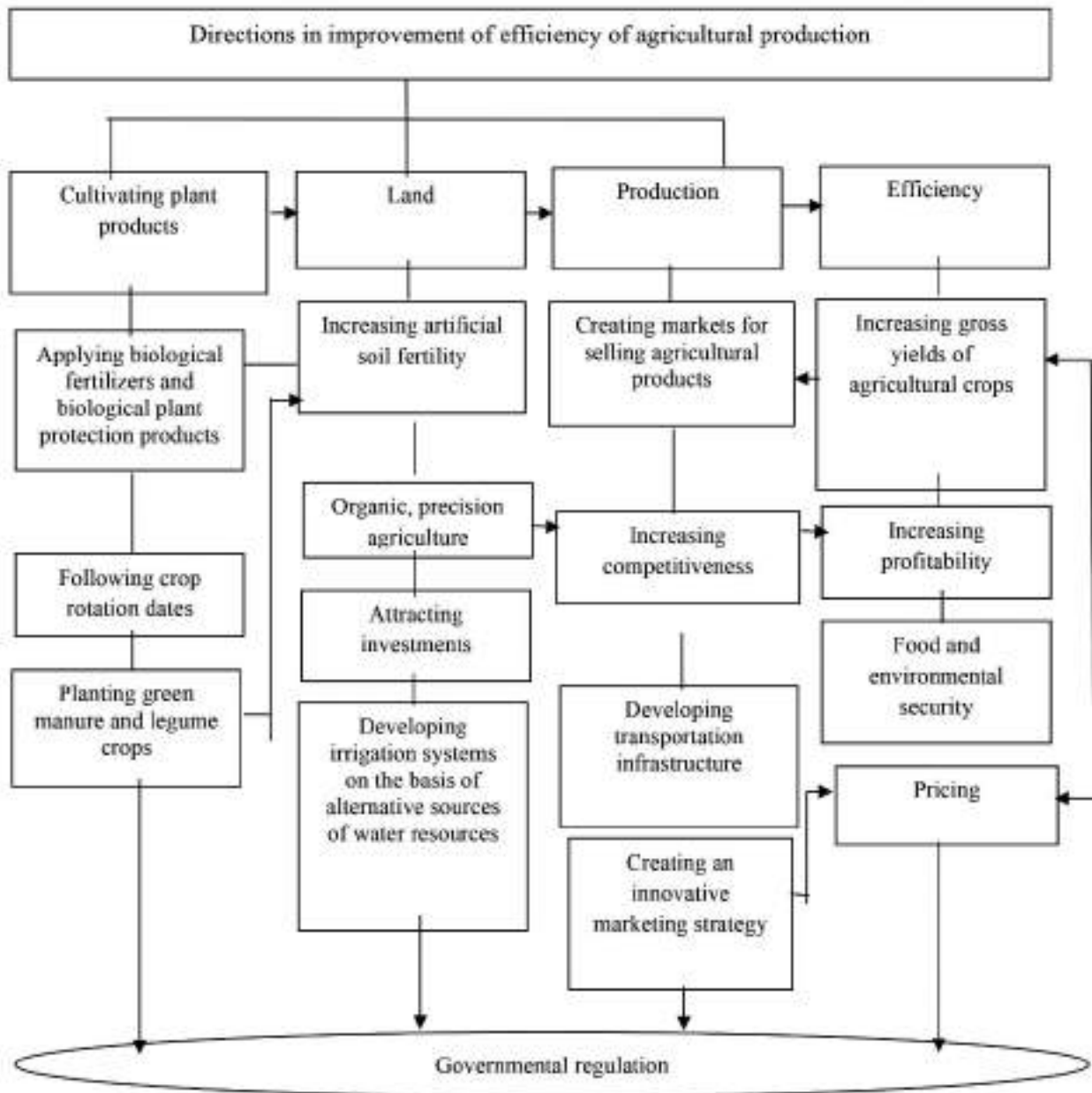
Under conditions of global warming, economic entities in agribusiness have to involve additional material resources for land cultivation and financial expenditures for application of nutrients to soil, causing an increase in the cost price of agricultural production and a lower level of its profitability. An increase in the volumes of gross production of plant products at the expense of the use of land resources will make financial results of agricultural enterprises worse. Therefore, in order to weaken the consequences of irrational land use and increase economic efficiency of agriculture, it is reasonable to enhance the management mechanism in agricultural production on the basis of the formation of a new managerial strategy for agricultural enterprises aimed at forecasting weather conditions, quality of the environment and the development of methods for adaptation of an enterprise to external changes (Figure 2).

Growing legume crops is a promising trend for agricultural production, since their productivity increases to 20 % under conditions of an increase in air temperature and insufficient moisture of farmlands.

Under a low level of water supply in the Steppe zone and a reduction in the average annual amount of precipitation, it is necessary to apply alternative sources of irrigation for agricultural crops using treated wastewater and organizing a drainage system for catching storm runoffs.

In order to increase the level of moisture supply for soils, it is recommended to use artificial soil cover made of nonwoven textile or natural vegetation. There can be less signs of erosion processes due to windbreaks, reduction in the acreage of arable lands and use of lands for permanent natural landscapes.

Transition to the system of precision (digital) agriculture using geo-information technologies which accumulate information about soil quality, the level of productivity of agricultural crops, the amount of applied fertilizers, chemical ameliorants and plant protection products is a promising trend for the development of agribusiness. Such innovative strategy of management for agricultural production will contribute to rational use of natural resources, a reduction in a negative impact of climatic conditions on the level of productivity of agricultural crops to 80 %, an increase in profits to \$75 per hectare.



**Figure 2. Directions in management of agricultural productions**

### CONCLUSIONS AND FURTHER RESEARCHES DIRECTIONS

Anthropogenic activity has caused global climate change, more manifestations of extreme temperatures, an increase in the number of intensive ineffective rainfalls, resulting in a reduction in the potential of regeneration of natural ecosystems, worse indexes of soil fertility and water scarcity. The multi-year research on distribution of the average annual temperature and the amount of precipitation in the Steppe zone allowed identifying negative changes concerning a rise in the average annual temperatures, a fall in the level of precipitation causing increased aridity of farmlands. Moisture deficit of the territory under study was determined at the level of 460 mm by the value of a climatic balance. The development of erosion processes resulted in the average annual losses of humus – 1.38 t/ha. There was a drop in the productivity of agricultural crops to 50 %.

Under conditions of an increase in the average annual temperature there was a higher content of phosphorous – 147 mg/kg and a high content of potassium – 193 mg/kg which have a positive impact on the

development of agricultural crops, and facilitate their resistance to moisture deficit and plant diseases. According to the evaluation of soil fertility in the Steppe zone considering the impact of climate change, it was established that the soils are referred to the 4<sup>th</sup> grade of satisfactory quality. It is appropriate to take measures aimed at adaptation of agriculture and implement the strategies to improve management of agricultural production under global climate change.

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## ECOLOGICAL AND ECONOMIC CONSEQUENCES OF THE DEFLATIONARY DESTRUCTION OF THE UKRAINIAN STEPPE SOILS

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### **ABSTRACT**

*The decrease in the efficiency of agriculture is associated with the impact of wind erosion, the consequences of which are a decrease in soil fertility. Significant manifestations of wind erosion are characteristic of arid and semiarid zones, which have a small amount of precipitation, high air temperature and evaporation rates, enhanced by strong winds and low differentiation of plant protection. It has been proven that the intensity of the deflationary process' manifestations depend on the physical and geographical conditions of agricultural land location, the systematicity of soil protection measures and the presence of vegetation. It was established that the acceleration of deflationary processes occurs in territories with increased anthropogenic load, which lead to an ecological disturbance of territorial ecosystems natural balance. During the conducted research, it was found that the natural processes of wind erosion are greatly aggravated by the lack of a scientifically based and ecologically remedial system of agriculture, which leads to the destruction of the soil cover, a decrease in soil fertility, damage to agricultural crops and, as a result, economic losses. As a result of GIS and ERS technologies application, as well as an empirical and statistical model of possible soil loss in the territory of the Ukrainian Steppe zone due to wind erosion, it was determined that because of deflation processes in the territory occupied by pure steam in the absence of anti-deflation measures conditions, the value of soil loss in the epicenter of dust windstorms can reach about 600 t/ha. Research has proven the importance of the anti-deflation effect of vegetation, which causes an increase in erosion-dangerous (favorable) areas of agricultural land by 1.7 times, which reduces soil loss by 5.62 times. In accordance with the intensity of deflationary processes manifestations and the excess of soil losses, contour-ameliorative anti-deflation measures with the elements of soil protection agriculture are proposed.*

**Ke words:** *wind erosion, soil loss, ecological and economic consequences, modeling, GIS, ERS*

### **INTRODUCTION**

The spread of wind erosion influence zone leads to a decrease in the efficiency of agriculture, as the deflationary-spatial redistribution of soil parts reduces the level of soil fertility, which is the main factor of influence on agricultural crop yield. The intensity of the deflationary process depends on the physical and geographical conditions of agricultural land allocation, the systematic nature of soil protection measures, and the presence of plant cover [1]. Significant manifestations of wind erosion are typical for arid and semiarid zones, which have a small number of precipitations, high air temperature, and evaporation rates, reinforced by strong winds and low differentiation of plant protection.

As a result of the conducted research, it was determined that the acceleration of deflationary processes takes place on territories with the increased anthropogenic load, which leads to ecological violation of territorial ecosystems' natural balance [2, 3, 4]. Therefore, determining the influence of factors and processes of wind erosion, their occurrence frequency, and inhomogeneity of spatial distribution on the economic efficiency of agriculture is a relevant research direction in the context of ensuring conditions for sustainable land use.

It has been established that the increase in the amplitude of air and soil temperature fluctuations, a decrease in the amount of annual precipitation, the hydrothermal coefficient, a reduction of frost-free period, and an increase of wind activity led to the development of deflationary processes, which is determined by the manifestations of an erosion-dangerous climate, which is determined by continentality [5, 6]. First, in the zone of increased wind-erosion processes, there are soils of the Steppe zone, which are characterized by a light granulometric composition, a low speed of soil formation, a medium and low level of humus content, weak cohesion and strength of the soil clod. On the steppe, mainly flat relief, the wind gains a high speed,

which causes an increase in the shock force of particle transport. The main factors of the degree of manifestation of deflationary destruction of the soil cover are the characteristics of the wind (speed, frequency of repetition, its force, and duration), the ground surface (vegetation, its height, and density of the cover, surface roughness, the presence of soil moisture), soils (the size of particles, their connection density, distribution of aggregates and amount of organic matter). Soils with a ratio of 20–30% clay, 40–50% dust, and 20–40% sand have the highest degree of anti-deflation resistance [7, 8].

Thus, erosive degradation of land causes a deterioration of the natural soil properties to decrease of soil fertility, a reduction in biodiversity, a deterioration of surface and groundwater quality, and a decrease in agroecosystems productivity. It has been proven that deflation losses of 10 cm of the fertile soil layer are equal to the displacement of more than 1 thousand t / ha of soil [2, 3], and if the average high degree of erosion is determined, there are lands with a loss of up to 5 thousand t/ha of soil. In full profile chernozems (black earth), the humus reserve is 216 t/ha, as a result of erosion, losses reach 114 t/ha.

In this context, solving the problem of rational use and protection of agricultural land should become a priority direction of state policy in the sphere of land relations and ensuring sustainable land use.

It was determined that there was a steady trend towards an uncontrolled intensification of the erosion degradation processes, dehumidification, acidification, and a decrease in soil fertility. In the conditions of climate change, the negative processes of soil degradation are a significant factor in the intensification of land degradation processes and the negative impact on the productivity of agroecosystems, which reduces the efficiency of agricultural production.

### **RECENT RESEARCH AND PUBLICATIONS ANALYSIS**

In particular, the determination of the ecological and economic consequences of the deflationary destruction of the steppe soils of Ukraine is reflected in the publications of A.B. Achasov [9], S.A. Balyuk [7], S.Yu. Bulygin [10], M.D. Voloshchuk [11], E.G. Degodyuk [12], F.M. Lisetskii [1], O.S. Sytnyk [8], A. Sameni [13], O.G. Tararika [14], S.G. Chorny [15], G.V. Schwes [16, 17]. To establish the level of danger of deflationary processes, to determine the level of damages from their manifestations, contour-and-meliorative anti-deflationary measures with elements of soil protection agriculture were proposed, and the system of estimation of losses by socio-cultural component has been expanded.

The influence of wind erosion manifestations processes in the Steppe zone of Ukraine on the efficiency of agriculture actualizes the need for spatial differentiation modeling and forecasting of potential soil erosion losses. Currently, a functioning system for forecasting potential soil erosion losses requires the creation of spatial models of soil deflation losses, which are the basis for determining adaptive anti-erosion-soil protection and contour-melioration measures, it is necessary to apply geostatistical and mathematical models with elements of Earth's remote sensing.

The aim of the work is geomodeling of potential deflationary losses of soils in the Steppe zone of Ukraine, aimed at determining the ecological state of agrolandscapes, designing an adaptive complex of anti-erosion and soil protection, and contour-meliorating measures aimed at increasing the efficiency of agricultural production.

### **RESEARCH METHODS**

In the process of research, the possibility of using different approaches to calculating deflationary soil losses was analyzed. In particular, the researcher Bagnold [18] proposed the equation of sand movement depending on the wind speed over the eroded surface. A modified form of this equation was proposed by Zingg [19], but it was not widely used. Chepil [20] noted that the method proposed by the authors excludes Spatio-temporal differences of certain factors, so it was proposed to calculate potential wind erosion using a method similar to the equation of soil loss from water-erosion processes. We believe that the proposed method is universal, but due to the existing significant metric differences of the fields, it complicates the

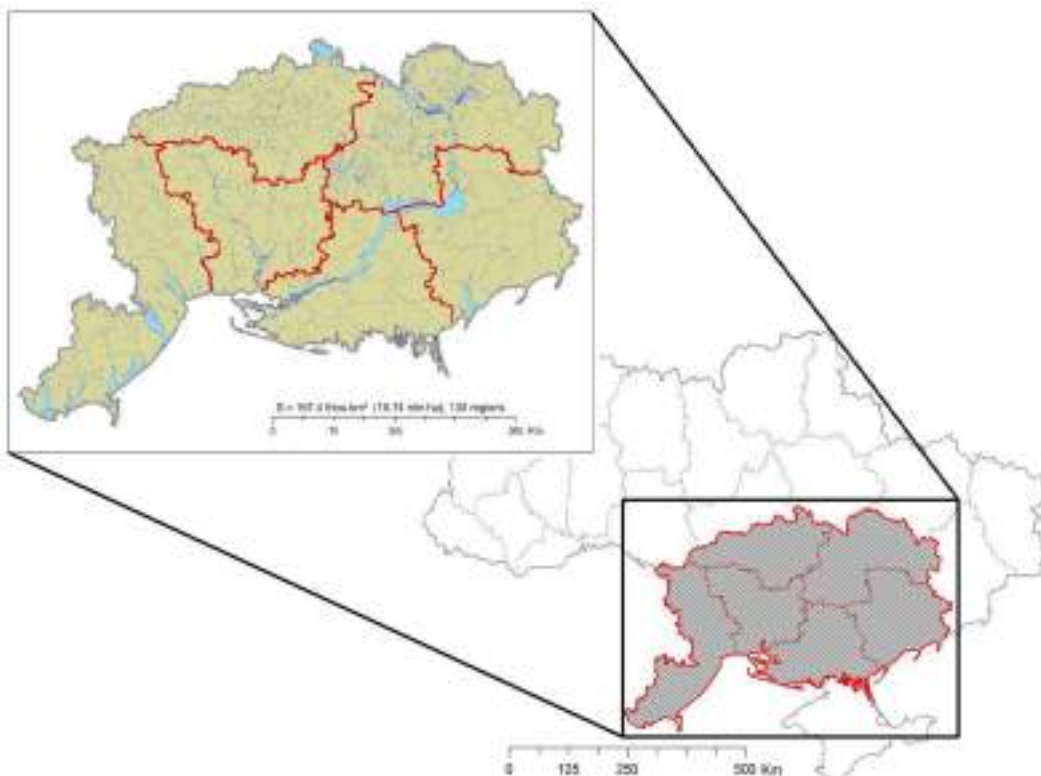
process of obtaining an accurate spatial model of the average protection of the field length, which causes errors in soil loss calculations [21].

In this regard, in the process of determining possible soil losses on the territory of the Ukrainian Steppe, the model of wind erosion of the NSC "Institute of Soil Science and Agrochemistry named after the name of O.N. Sokolovsky", which is adapted to different physical and geographical conditions of the country [9, 10, 22]:

$$E_p = \frac{10^{a-bk} \cdot 0.1K_s \cdot V_{av\_max}^3 \cdot t \cdot K_{spe}}{V_{aer}^3}, \quad (1)$$

when  $E_p$  is potentially possible deflationary soil losses, t/ha per year; a, b – power coefficients that depend on the genesis, granulometric composition, density and some other properties of soils (calculated experimentally); k – lumpiness of the surface (0-3 cm) layer of the soil (content of aggregates or particles larger than 1 mm), %;  $K_s$  is the coefficient of destruction of aggregates of the surface layer of the soil under the influence of impacts of soil particles and their abrasion by air-dust flow;  $V_{av\_max}$  is the average maximum wind speed during dust storms of the 20th reliability, m/s (20% reliability shows that this indicator, determined on the basis of long-term data, is correct in 80 cases out of 100, that is, only in 20% of cases the wind speed during dust storms will be greater); t - the average number of hours of wind erosion per year based on long-term data;  $K_{spe}$  – coefficient of soil protection efficiency of anti-deflation measures;  $V_{aer}$  is the basic flow speed in the aerodynamic installation, which is equal to 23 m/s in terms of vane height (10 m); 0.1 – conversion from g/m<sup>2</sup> in 5 minutes to t/ha per year.

The calculation of soil deflation losses was carried out in the GIS environment of the licensed software product ArcGIS 10.1, for this purpose raster models (cell size 30 × 30 m) of the distribution of individual factors in the territory of the Steppe zone of Ukraine (Fig. 1) with a total area of 167.4 thousand km<sup>2</sup> were created, including the area of agricultural land is 131.6 thousand km<sup>2</sup>. The agricultural development of the research region varies between 20–97%.



**Fig. 1. Spatial characteristic of studied territory**

Spatial models of the distribution of regression coefficients ( $a$ ,  $b$ ), lumpiness ( $k$ ) and destruction coefficients ( $K_s$ ) were created based on assigning the corresponding values to each soil variety of the Steppe zone of Ukraine (Fig. 2). Raster models of the spatial distribution of the average maximum wind speed during dust storms ( $V_{av\_max}$ ), as well as the average number of hours with the manifestation of wind erosion per year ( $t$ ) on the territory of the steppe soils, were obtained based on the extrapolation of decompositions of meteorological map data based on the averaged data of 1990–2018.

The coefficient of soil protection efficiency of anti-deflation measures ( $K_{spe}$ ) is calculated according to the modified erosion index of crop or the coefficient of crop cover ( $C'$ ), which reflects the level of efficiency of growing agricultural crops, as well as the effectiveness of the natural plant cover (trees, grasses) of the territory of the land in reducing soil loss. It has been proven that the increase in vegetation leads to a decrease in soil loss. The coefficient of vegetation cover ( $C'$ ) is the most sensitive to soil loss [23, 24].

To determine the factor  $C'$ , the data of the remote sensing of the earth (RSE) of the correctly calibrated Landsat-8 satellite image with a geometric resolution (spatial resolution) of  $\sim 30 \times 30$  m as of March and August 2018 were used. The factor values were generated based on the dimensionless NDVI (normalized differential vegetation index), using a modified formula [25]:

$$C = \exp(-\alpha((NDVI)/(\beta - NDVI))) \quad (2)$$

$$C' = C/\max(C) \quad (3)$$

where  $\alpha$  and  $\beta$  are dimensionless parameters that determine the shape of the curve related to NDVI and  $C$  factor. Parameters  $\alpha$  and  $\beta$  have values of 2 and 1, respectively. The value ranges from 0 (maximum anti-deflation effect of vegetation cover) to 1 (minimum or no anti-deflation vegetation).

The proposed method of calculating soil deflation losses is the main component of environmental assessment, which allows us to offer the assessment of losses from soil degradation. Cost, income, and comparative methods are used in the evaluation process. To preserve land for future generations, as the main productive resource that is a component of national wealth, it is necessary to determine the amount of social losses from degradation. Social losses, in addition to direct losses of agricultural products and a decrease in the level of economic indicators of production, should include the costs of restoring the fertility of soils and their condition. Researchers [26] suggested calculating losses from soil degradation and depletion, we supplemented the calculation system with an indicator of socio-cultural losses:

$$P_{\text{losses}} = B_{\text{evaluation}} + B_{\text{restoration}} + B_{\text{damage}} + B_{\text{economic services}} + B_{\text{sociocultural}} \quad (4)$$

This method includes the costs for research and assessment of damage, as a rule, it consists of laboratory tests cost and analytical processing; costs for elimination of the negative consequences of erosion processes, and costs for soil restoration (anti-erosion measures to improve and preserve soils); cost of lost and damaged natural objects; the cost of lost ecosystem services in relation to the environmental protection functions of soil ecosystems; socio-cultural losses, which reflect the lost society's capacity based on its perception of information about losses of this kind of resource.

## RESULTS AND DISCUSSION

13.4 million hectares are under the influence of water erosion, which is 31.4% of the total area of rural, areas of land (42.7 million hectares). The impact of wind erosion is 6 million hectares (14.0% of the area of agricultural lands), and in the years of dust storms – 20 million hectares, of which 75% are slightly eroded, and 25% are moderately and strongly eroded. It should also be noted that more than 500,000 hectares of fertile land have been disturbed by ravines. Thus, it was determined that in the absence of ecologically justified anti-erosion measures, there is an intensive transition of lands from the category of weakly eroded to the category of moderately eroded and heavily eroded, which significantly affects the decrease in soil fertility.

It was determined that over the past 40 years, the area of eroded land on the territory of Ukraine has increased by 2.5 million hectares, with an annual increase of 60-80 thousand hectares of eroded arable land.

Soil erosion losses on the territory of Ukraine are on average 10-15 t/ha per year, and the total average annual soil losses, according to various data, range from 260 million tons to 500 million tons of soil [27, 28]. In the period 1960–2015, the area of eroded soils occupied by agricultural land increased by 30–35%, the area of strongly eroded soils increased by 20%, weakly and moderately eroded soils by 2 and 12%, respectively [29].

According to the research results, it was established that Ukraine ranks 9th among European countries in terms of the intensity of erosion processes. Up to 24 million tons of humus from agricultural land, as well as 0.96 million tons of nitrogen, 0.68 million tons of phosphorus, and 9.40 million tons of potassium are removed with erosion products. In this regard, the yield of agricultural crops on eroded soils decreases by 20-60%.

Therefore, losses of agricultural products due to erosion exceed 9-12 million tons of grain units per year, and economic losses under such conditions reach \$6.0 billion [30].

The reason for negative erosion manifestations is the high degree of plowing of the territory of Ukraine, more than 80% of agricultural land is plowed, of which 53.8% is arable land. In recent years, the lands of the hydrographic fund, steep slopes, water protection zones, floodplains, and riverbeds have been intensively plowed. This is the result of an uncontrolled process of land use in the conditions of incomplete land reforms, which is exacerbated by the lack of clear state, regional, and local soil protection programs, the development of effective mechanisms for economic stimulation of agricultural producers to protect soils from erosion, and the lack of a system of scientifically based ecological norms for the assessment of land resources.

If it is necessary to develop a system of soil protection anti-erosion contour-ameliorative measures, it should be taken into account that sloping arable land is erosively dangerous, and about 80% of them are classified as weakly and moderately erosively dangerous; 20% of lands are at increased erosion risk, which require fundamental changes in the anti-erosion organization of the territory based on a soil-protective, resource-saving, biologically clean, ecologically safe farming system. An important component of the process of optimizing the structure of agrolandscapes and land use systems is their agroecological typification and zoning according to the resources of heat, moisture, soil fertility, and risks of erosion processes, which are the main factors of degradation and desertification of agrolandscapes [21].

It was determined that the increase in row crops in crop rotations is accompanied by the intensification of erosion processes and soil dehumification. As well as the increase in the intensity of torrential rainfall and the wind regime against the background of the increase in row crops and the actual cessation of the introduction of anti-erosion measures, causes the acceleration of soil erosion degradation in all soil and climate zones of Ukraine.

During the conducted research, it was established that the natural processes of wind erosion are greatly exacerbated by the lack of a scientifically based and ecologically remedial system of agriculture, which leads to the destruction of the soil cover, a decrease in soil fertility, damage to agricultural crops and, as a result, economic losses (Fig. 2)

To establish the cause-and-effect relationships of the development of wind erosion, it was determined that the increase in arable land occurs mainly due to the reduction of pastures, the vegetation cover of which performs the function of restoring soil fertility. This, in turn, led to an increase in deflationary dangerous areas and the frequency of periods of negative effects of wind erosion. Also, the lack of ecologically justified crop rotations and manifestations of monoculture cultivation caused a decrease in the natural stability and fertility of the soil.

The systematic use of old methods of removing plant residues (burning stubble and straw) leads to a decrease in the soil protective effect and the supply of organic matter in the soil, necessary for maintaining the soil structure and fertility. The lack of ecological justification for the use of mineral fertilizers leads to a decrease in the density of soil aggregates, and the improvement of weed control methods reduces their anti-deflationary role. Cutting of protective forest strips increases the impact force of the wind, which leads to a

violation of the water-holding and infiltration properties of the soil, causing washout and spring erosion, which causes a redistribution of soil material, causing the formation of a complex soil profile.

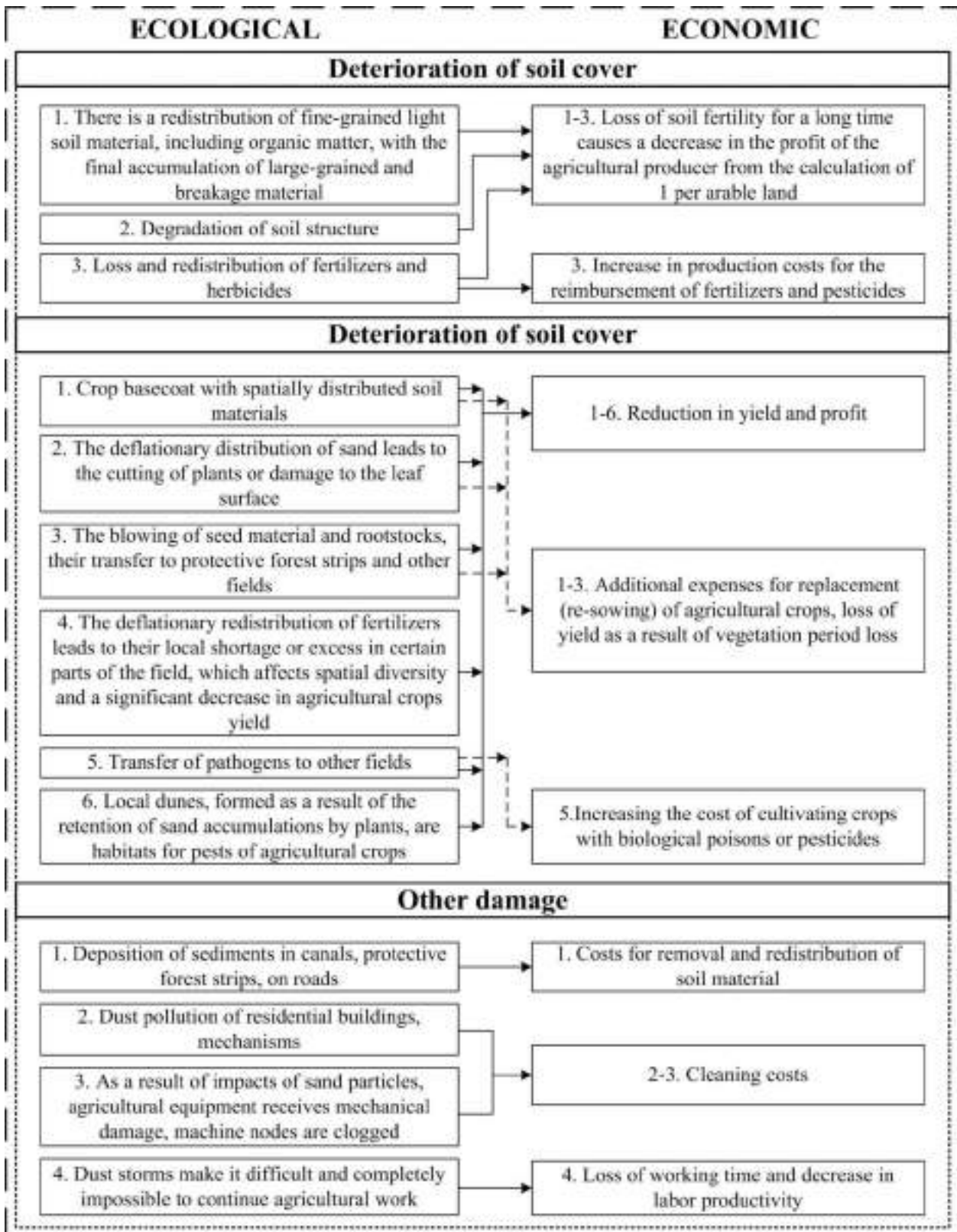
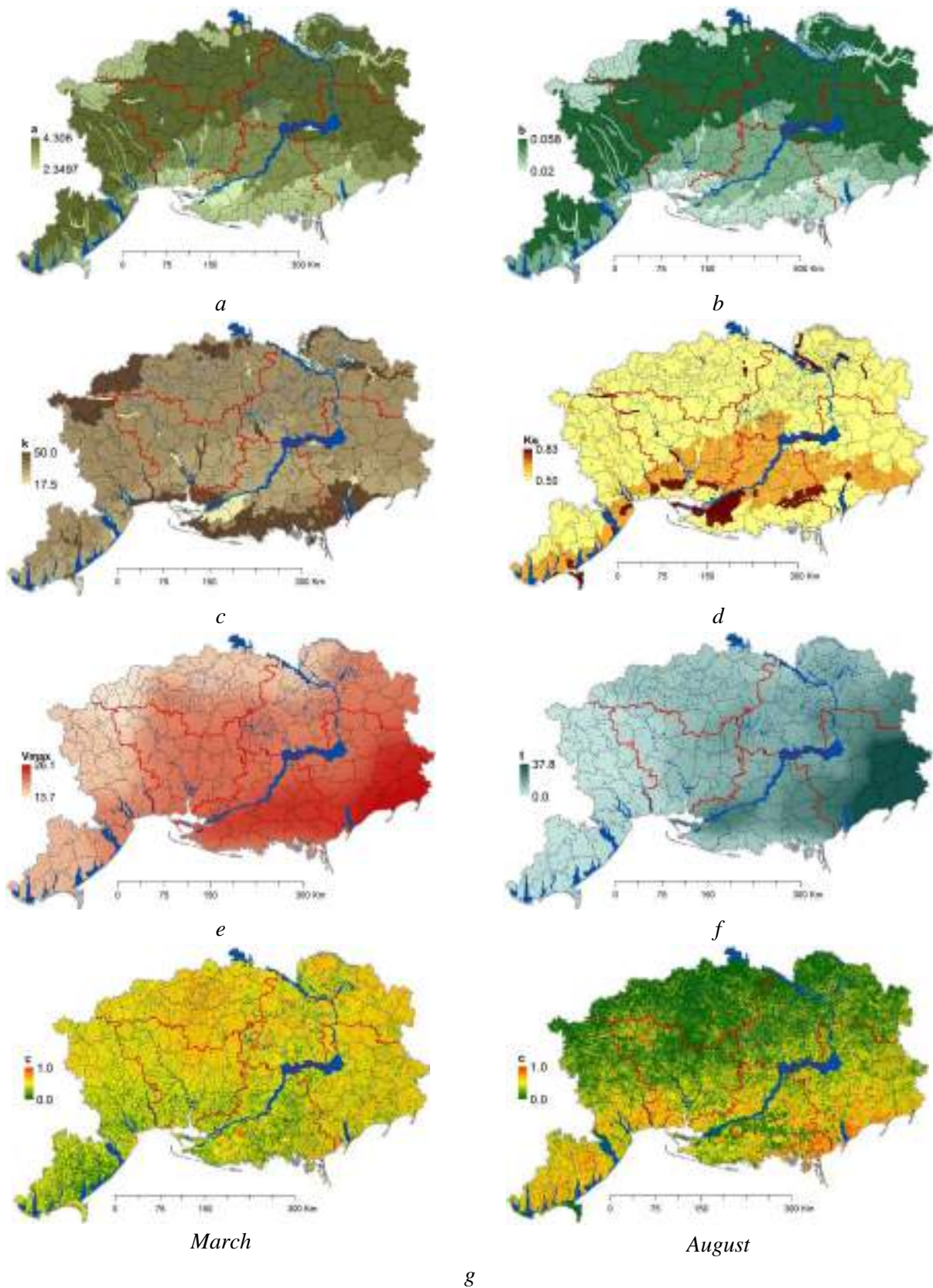


Fig.2. Ecological and economic consequences of wind erosion

The researchers established that the low effectiveness of the existing contour-and-meliorative anti-deflation measures in the Steppe zone of Ukraine caused a large-scale disaster in 2007, when about 20% of agricultural land was at the epicenter of dust storms. In this regard, soil losses ranged from 10 to 400 t/ha [15]. Therefore, the problem of soil protection from degradation processes, especially in the steppe regions of Ukraine, has become particularly urgent and requires detailed comprehensive research in the direction of developing scientifically based regional soil protection systems of agriculture, finding new reproducing methods of eroded lands fertility.

For this purpose, as a result of spatial modeling, raster models of spatial differentiation of wind-erosion factors were created and soil deflation losses were calculated on the territory of the Steppe zone of Ukraine. The regression coefficients ( $a$ ,  $b$ ), lumpiness ( $k$ ), destruction coefficients ( $K_s$ ) for the main soils of Ukraine were calculated in accordance with the method of potential soil losses [9]. Studies have determined that the coefficients of the characteristics of genesis, particle size composition, density and other properties of the soils of the steppe region vary by factor- $a$  (Fig. 3a) from 2.3497 (turf-podzolic, turf-podzolized, gleyed, podzolized sandy, clay-sandy and sandy soils) up to 4.3060 (chernozem (black soils) typical and ordinary medium and strongly eroded soils), factor- $b$  (Fig. 3b) from 0.020 (chernozem (black soils) southern saline soils) to 0.058 (chernozem (black soils) typical and ordinary medium and strongly eroded soils). The average value of the  $k$  factor (Fig. 3c) varies from 17.5% (turf-podzolic, sod podzolized, gleyed, podzolized sandy soils, clayey-sandy and sandy soils) to 50.0% (gray podzolized, chernozems (black soils) with podzol and saline, chestnut saline, saline loam and clay soils),  $K_s$  factor (Fig. 3d) from 0.5 (chernozems (black soils), typical and ordinary medium and strongly eroded soils) to 0.83 (sod-podzolic, sod podzolized, gleyed, sandy soils, clay-sandy and sandy loam soils). Average maximum wind speeds during dust storms with 20% probability ( $V_{av.max}$ ) decrease from the southeastern part of the research region to the northeastern from 26.1 to 13.7 m/sec. (Fig. 3e), the average number of hours per year with dust storms ( $t$ ) in the Steppe zone of Ukraine also varies in this direction from 0 to 37.8 hours. (Fig. 3f).

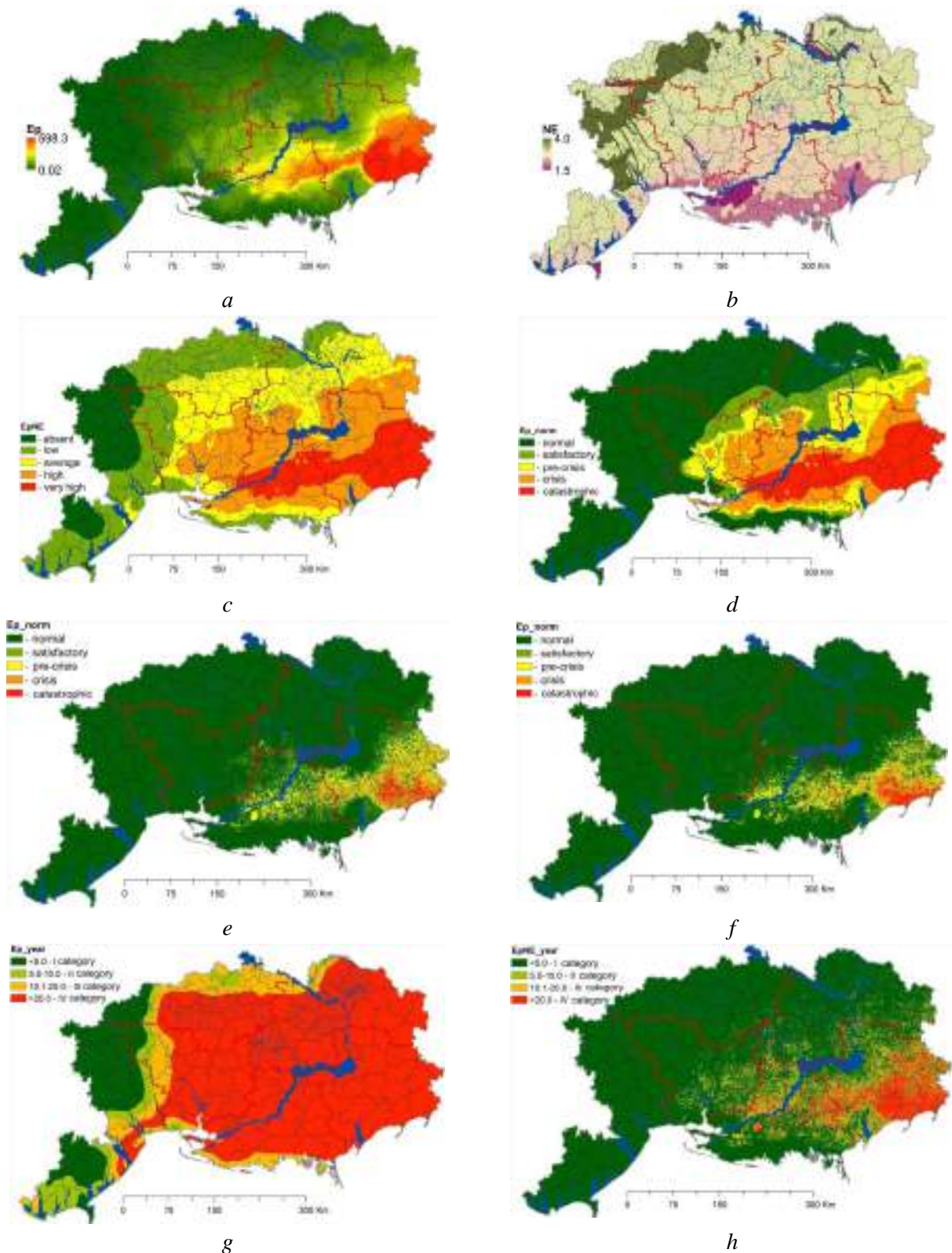
The modified factor- $C'$  – is the crop erosion index or vegetation cover factor, which determines the soil protection effectiveness of anti-deflation measures ( $K_{spe}$ ) on the territory of steppe soils. This index determines the influence of agricultural culture (crop rotation or plant cover) and natural vegetation on deflationary processes. To establish the influence of the modified factor- $C'$  on deflation processes, a correctly calibrated Landsat-8 satellite image was deciphered and a raster model of the spatial distribution of the factor- $C'$  was obtained on the research steppe region territory as of March and August 2018 (Fig. 3g). Spatial differentiation of the factor- $C'$  deflationary impact depends on the distribution of land areas occupied by natural vegetation and agricultural crops, and its seasonal value varies from 0 to 1. As a result of GIS modeling using a model of potentially possible soil losses because of deflation processes on the territory occupied by pure steam, in the absence of anti-erosion measures (Fig. 4a), soil losses in the epicenter of dust storms will range from 0.02 t/ha to 598.3 t/ha.



*a, b – coefficients that depend on the genesis, grain size composition, density, and other properties of the soil; c – lumpiness of the surface layer of the soil, %; d – coefficient of the destruction of aggregates of the surface layer of the soil; e – average maximum wind speed during dust storms of the 20th security, m/sec.; f – the average number of hours with the manifestation of wind erosion per year; g – coefficient of anti-deflationary effectiveness of culture or crop rotation*

**Fig. 4. Spatial distribution of the deflation process factors in the Steppe zone of Ukraine**





*a* – potentially possible deflationary soil losses from areas occupied by pure steam; *b* – annual rates of soil erosion; *c* – degree of wind erosion processes danger according to soil differences; *d* – the degree of wind erosion processes development in accordance with their standards; degree of seasonal wind erosion processes danger taking into account the c-coefficient: *e* – March; *f* - August; distribution of the territory by categories of deflationary soil losses: *g* – in the absence of anti-deflationary measures; *h* – taking into account the coefficient of anti-deflationary effectiveness of culture or crop rotation.

**Fig. 5. Modeling of the spatial distribution of potential deflationary soil losses (t/ha) in the Steppe zone of Ukraine**

In order to determine the dangerous degree of wind erosion for the main soils of the flat territory of Ukraine, the norms of wind erosion processes were taken into account (Fig. 4b): turf-podzolic: turf and glee, their types, sandy and sandy, the rate of erosion is 1.5 t/ha; silted soils, glaciated and regraded types thereof, ordinary chernozems (black soils) of all types – 3.0 t/ha; typical chernozems (black soils) of all types, meadow-chernozem(black soils), meadow and chernozem(black soils) -meadow soils of all types on loess, alluvial and deluvial rocks – 4.0 t/ha; southern chernozems(black soils) of all types, clay-sandy chernozems(black soils), saline chernozems(black soils) on non-forest rocks – 2.5 t/ha; dark chestnut, chestnut salt marsh, meadow-chestnut salt marsh, glaciated salt marsh and sweetened soils of pods, salt marshes and salt marshes, meadow-marsh, swamp – 2.0 t/ha.

There are no deflationary soil losses in the territories (Fig. 4c) without exceeding their normative value (about 11.80% of the area of agricultural land (Table 1); weak erosion is manifested on 26.56% of the area with an excess of the soil loss rate up to 10 times; average – an excess of 10–30 times with an area of 23.5% of agricultural land; strong – from 30 to 100 times, the area of action is 25.96%; very strong – from 100 to 300 times, about 12.19% of lands; catastrophic – more than 300 times with the possibility of abnormal phenomena.

**Table 1. Distribution of arable land areas according to the degree of wind erosion processes danger manifestations**

Degree of wind erosion processes development	Excess soil loss over the standard of erosions, times	Area, thousand hectares	Specific gravity, %
<b>The danger degree of wind erosion processes based on soil differences from the territories occupied by pure steam in the absence of anti-deflation measures</b>			
Missing	0-1	1552.7	11.80
Weak	1-10	3495.5	26.56
Average	10-30	3092.5	23.50
Strong	30-100	3416.5	25.96
Very strong	100-300	1604.8	12.19
<b>The degree of wind erosion processes development in accordance with their standard losses</b>			
Normal (favorable)	1-20	6924.6	52.61
Satisfactory	20-30	1216.2	9.24
Pre-crisis	30-50	1623.5	12.33
Crisis	50-100	1792.9	13.62
Disastrous	> 100	1604.8	12.19
<b>The seasonal danger degree of wind erosion processes, considering the ratio of anti-deflationary effectiveness of culture or crop rotation</b>			
<i>March</i>			
Normal (favorable)	1-20	11404.9	86.65
Satisfactory	20-30	664.8	5.05
Pre-crisis	30-50	585.8	4.45
Crisis	50-100	374.4	2.84
Disastrous	> 100	132.1	1.00
<i>August</i>			
Normal (favorable)	1-20	11715.4	89.01
Satisfactory	20-30	535.9	4.07
Pre-crisis	30-50	475.0	3.61

Crisis	50-100	303.4	2.31
Disastrous	> 100	132.2	1.00
<b>Distribution of the territory by categories of deflationary soil losses in the absence of anti-deflation measures, t/ha</b>			
I category	< 5.0	1864.6	14.17
II category	5.0-10.0	840.4	6.39
III category	10.1-20.0	1581.5	12.02
IV category	> 20.0	8875.4	67.43
<b>Distribution of the territory by categories of deflationary soil losses considering the ratio of anti-deflationary effectiveness of culture or crop rotation, t/ha</b>			
I category	< 5.0	10482.4	79.64
II category	5.0-10.0	1102.8	8.38
III category	10.1-20.0	7981.9	6.07
IV category	> 20.0	777.9	5.91
Total:		13162	100

In accordance with the excess of potential soil losses from deflation processes (Fig. 4d), it is recommended to implement appropriate anti-erosion measures. In particular, in the territories of the Steppe zone of Ukraine with a normal (favorable) degree of manifestation of wind erosion processes with an allowable excess of soil loss above the erosion rate up to 20 times, it is worth implementing conventional soil protection measures on 52.61% of agricultural land; in territories with a satisfactory degree of exceeding the norm from 20 to 30 times on 9.24% of land, it is necessary to carry out additional detailed calculations of soil losses, to implement minimal or "zero" soil cultivation technologies, the design distances between the main forest strips should not be more than 15-20- multiple height of plantings; in territories with a pre-crisis degree of deflationary soil loss (exceeding the norm by 30–50 times) with an area of 12.33% of land, it is necessary to implement soil protection systems of tillage, to carry out additional engineering calculations of soil losses and calculations of optimal distances between the main forest strips; in territories with crisis deflation processes (exceeding the norm by 50-100 times), the area of agricultural land is 13.62%, the frequency of droughts is 1.5-3.5 years with a hydrothermal coefficient of 0.2-0.3, a minimum system needs to be implemented soil protective tillage, mandatory seasonal calculation of soil losses and adjustment of optimal distances between forest strips, in addition, it is necessary to adjust the ratio of the main lands, moderate moistening during irrigation; the catastrophic degree of manifestation of wind erosion processes has territories of steppe soils with an area of 12.19% with an excess of soil loss norms more than 100 times, the frequency of manifestations of droughts is 1.5-2.0 years with a hydrothermal coefficient of 0.2-0.3, according to the data territories, scientific substantiation of soil protection optimization of the structure of the main land areas, implementation of special land reclamations, measures against salinization, soil salinization, and desertification of territories is necessary.

According to the intensity of deflationary destruction of soils manifestations, agricultural lands of the Ukrainian Steppe zone are divided into IV categories of erosion danger, in accordance with which contour-meliorating anti-deflation measures are implemented: I - lands that are not subject to wind erosion, soil loss is less than 6 t/ha; II – lands with weak wind erosion, soil losses of 6–10 t/ha; III – lands with average wind erosion, soil losses of 11–20 t/ha; IV – land with strong wind erosion, soil loss of more than 20 t/ha. Potential soil losses under the conditions of the anti-deflation effectiveness of culture or crop rotation (Fig. 4h) compared to the model of anti-deflation measures absence (Fig. 4g) are reduced by 5.62 times, which allows to optimize additional monetary expenditures for the implementation of anti-deflation measures: 1st category of agricultural land with a specific area of 79.64%, it is recommended to apply zonal agrotechnical measures with preservation and restoration of field protection forest strips; II with an area of 8.38%, the simplest anti-

erosion measures are recommended - the optimal timing of soil treatment, fertilizer application, snow retention, no-till cultivation and sowing with the preservation of stubble on the soil surface, placement of crops and pairs in alternating strips 100–200 m wide and perpendicular to the direction erosive winds, additional creation of field protection forest strips; III-rd category of lands with a specific area of 6.07%, the same measures are carried out as on lands of II category, with the additional implementation of no-throw processing and sowing with maximum preservation of stubble, the creation of curtains from high-stemmed crops, strip placement of crops and pairs in combination with buffer strips of perennial grasses, creation of a system of field protection forest strips; IV-th category of land with an area of 5.91%, the entire complex of anti-erosion measures is recommended, including the introduction of soil-protective crop rotations with a predominant share in the crop rotation of perennial grasses, tillage and sowing with maximum preservation of stubble on the surface of the soil, continuous liming of wind-impacted slopes, placement of crops, steams and buffer strips with perennial grasses in strips 50–100 m wide perpendicular to the direction of erosive winds, creating a thickened network of forest strips.

To reduce the impact of temperature rise, drought phenomena, and water and wind erosion, it is necessary to develop and gradually implement anti-erosion soil protection measures aimed at the rational use of moisture resources. In conditions of high potential danger of erosive processes, it is effective to improve the management of surface runoff in the catchment basins of rivers by implementing a soil-, water-conservation contour and meliorative system of land use, which provide environmental protection and agro-economic efficiency.

The basis of the anti-erosion system is the contour organization of the agricultural land territory, differentiated in accordance with the topography of arable land, the use of hydro technical, forestry, and light improvement measures and the achievement of humus balance as a result of adjusting crop rotations.

In this context, it is necessary to implement the contour-ameliorative organization of the territory, subject to the implementation of the basin principles of land and water use [31, 32], which involves the development of appropriate national and regional soil protection programs from erosion degradation and desertification, adaptation of land use to new climatic conditions.

## CONCLUSIONS

As a result of GIS and ERS technologies application, as well as an empirical and statistical model of possible soil loss from wind erosion in the territory of the Ukrainian Steppe zone, it was established that because of deflation processes in the territory occupied by pure steam in the absence of anti-deflation measures conditions, the value of soil loss in the epicenter of dusty windstorms can reach about 600 t/ha. In accordance with the norms of soil differentiation, about 40% of agricultural lands have a strong and very strong degree of deflationary processes manifestation. Research has proven the importance of the vegetation anti-deflation effect, which causes an increase in erosion-dangerous (favorable) areas of agricultural land by 1.7 times, which reduces soil loss by 5.62 times. According to the intensity of the deflationary process's manifestations and the excess of soil losses, contour-ameliorative anti-deflation measures with elements of soil protection agriculture are proposed. Emphasis is placed on the importance of implementing a scientifically based and ecologically remedial system of agricultural management since its absence contributes to the negative consequences manifestation of soil cover destruction, a decrease in soil fertility, damage to agricultural crops, and, accordingly, economic losses. The conducted research should be used as a basis for the development of soil protection anti-erosion and contour-melioration measures, which will allow an economic assessment of the damage amount from erosion processes using the cost method, which will become the basis for the formation of the sustainable land use concept in the Steppe zone of Ukraine.

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## THE HISTORICAL BACKGROUND OF THE VACCINATION OF MANKIND

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### **ABSTRACT**

*The article analyzes theoretical principles of the history of vaccination as an important aspect of a healthy lifestyle. It is estimated that the beginning of vaccination reaches the Iron time, when the inoculation was practiced in India, and the ideology of vaccination was revealed by the ancient historian Thucydides. It is investigated that Abu Bakr al-Razi continued the development of the above-mentioned ideology after Thucydides. In the Middle Ages, the Ottoman Empire was the main focus of extension of the ideology of vaccination to foreign countries, where Lady Montagu brought the technology of vaccination to the United Kingdom. It investigated the history of spreading the ideology of vaccination in Europe and America in the 17-18 centuries. It is stated that the scientists John Fewster, Daniel Sutton, Benjamin Jesty, and Edward Jenner developed the ideology of vaccination in contrast to inoculation, and the last one invented the vaccine against smallpox based on cowpox. It is concluded that it is important to understand the significance of vaccination in the further development of mankind, which will help to complete the COVID-19 pandemic, despite the Russian invasion of Ukraine.*

**Keywords:** *pandemic, healthy lifestyle, vaccination.*

### **INTRODUCTION**

According to the general theory of a healthy lifestyle, compliance with the rules of rational nutrition, physical activity, a refusal of smoking and alcohol, a social activity are important elements of health preservation in the modern world. However, vaccination as one of the aspects of health preservation becomes urgent to curb the spread of viruses and infections in case of the spread of infectious diseases and the establishment of severe quarantine restrictions. In the 20<sup>th</sup> century the principles of health preservation in pandemic conditions, which are actual now, were fixed in International Health Relations 2005 by WHO's efforts, but the issue of health preservation in pandemic conditions are urgent and priority today and will remain in the future, according to the global problem [13]. According to the WHO, vaccination supports the human immune system and actively fights against the virus and bacteria that cause infectious diseases. Without it, even a person who adheres to the classic rules of health care can get infected or die from viral diseases [10].

Before the Russian invasion of Ukraine, the amount of vaccinated people has been approximately 35%, which indicated the low awareness of the importance of vaccination. Despite the fact that the Russian full-scale invasion of Ukraine continues, the coronavirus pandemic is going on, but with a reduced incidence, as many developed countries have successfully conducted a vaccination campaign.

### **THE ANALYSIS OF LATEST RESEARCHES AND PUBLICATIONS**

The scientific research of the determination the historical background of the vaccination development as one of the key elements of health preservation is outlined in research of foreign scientists. A. Boylston studied in detail the origin of inoculation, the primitive method of vaccination, and also disclosed the biographical information about Daniel Sutton, a forgotten English doctor who had been vaccinated in the UK. G. Williams emphasized that the vaccination in the United Kingdom appeared really well before Edward Jenner and explained the Robert Jesty's role in the further spread of the practice of smallpox vaccination. The Turkish scientists E. Poulakou-Rebelakou and J. Lascaratos disclosed the history of inoculation propaganda, which was recommended by Emmanuel Timonis and Jakob Pilarinos, and their role in the spread of inoculation practice to Europe. The Turkish scientists E. Ö. Evered, K. T. Evered investigated the historical background of vaccination in the Ottoman Empire. The English researcher J. Griffiths explained the role of British doctor Thomas Dimsdale in the establishment of vaccination in the Russian Empire. The

English scientist M. Bennett explained the essential role of Edward Jenner's invention in the subsequent campaign to vaccinate humanity. The Spanish scientists C. Franco-Paredes, L. Lammoglia, J. I. Santos-Preciado disclosed the history of vaccination in purpose of the vaccination expedition to the Portuguese and Spanish colonies of Asia and America, lasted in 1803-1806. I. Kryvoruchko and O. Shukatka analyzed the historical background of vaccination of the times of pervination, antiquity, and 17-18 centuries, when the ideology of inoculation expanded to European countries.

The purpose of the article is to study the theoretical analysis of the historical background of the vaccination of mankind.

## RESULTS AND THEIR DISCUSSION

The first phase of human vaccination covers the period of the Iron time, when people were already immunized against the virus, using materials that were removed from infected individuals, in North and East India, more than 3000 years ago. This process was called an inoculation. Probably, the technology of variation has expanded to China because Chinese scientists visited leading Indian universities for about 1000 years ago. Subsequently, vaccination technology has been expanded to the African continent and modern Turkey [20]. However, there were some shortcomings of the inoculation due to the mortality of cases, despite the less pathology of the virus [10].

The smallpox pandemic wasn't existed in Ancient times, because the Ancient Greeks followed the aspects of a healthy lifestyle, and got used to health care and observance of hygiene rules. However, the construction of the smallpox virus and its distribution conditions have become the subject of research by ancient Greek scientists. In 429 AD, the ancient historian Thucydides noted that those, who survived the infectious disease, would never suffer anymore from it in the future. Thus, those who survived received immunity to the virus by infection. As a result, the effectiveness of vaccination was studied. In Ancient Rome, a pandemic called Antonine Plague in 165-180 AD was recorded for the first time in the period of antiquity, in which more than 7 million people died. It managed to avoid disease through non-traditional medicine and invasive methods. Then the inoculation process didn't use. After the dissolution of the Roman Empire in 476 AD, the Middle Ages followed, when the disease of smallpox was rapidly growing, and the ideology of inoculation for a long time was irrelevant [10]. Spending money became a priority, so it became unprincipled. The population did not care for a healthy way of life, hygiene, and proper nutrition. Europe and Asia have absorbed protracted pandemics. It considered that health preservation could use only by using religious and non-traditional medicine [9]. Ascetics took the declarative position on this issue that recommended "washing the tears". It condemned even elementary hygienic procedures (in particular, visits to public baths) because they were considered as means that produced a "sinful cult of the body" and violated human morality. The fundamental change of human mass consciousness and the research position of the top-aged scientists concerning hygienic knowledge happened only under the influence of the catastrophe of the 14<sup>th</sup> century – the epidemics of plague [12].

In the Middle Ages, Thucydides' theory of inoculation effectiveness was forgotten in Europe: Arab-Muslim conquest of the European continent, Mongol-Tatar captures of Asia and Europe, active trade with the countries of the Old World from Africa, the Great Crusade caused the spread of the smallpox pandemic (in 570 AD Bishop Marij from Avansh first named the disease of smallpox variola in the Latin language). The smallpox epidemic first appeared in China in the 4<sup>th</sup> century and in the middle of the 6<sup>th</sup> century in Korea and Japan. In 737 AD more than 30% of the Japanese died from smallpox. However, at the beginning of the 7<sup>th</sup> century, Christian Egyptian, Greek scientist Ahrun (610-641) first in detail described smallpox as an infectious disease, but a significant contribution to the study of smallpox was made by a well-known Persian cyclist, doctor, and alchemist Abu Bakr al-Rāzī (865-925), who described the measles and smallpox in his work "A treatise on the small-pox and measles". He indicated that it is impossible to get sick repeatedly, or person, who recovered from smallpox, will get a protective immunity and won't be able to get sick again. He also emphasized the variolation against smallpox to avoid this disease in the future. Thus, al-Rāzī for the



second time after Thucydides pointed out the need for vaccination of the population. During the Middle Ages, Buddhist monks drank a snake poison to get immunity from the snake's bite [23].

Indians first invented the technology of variolation against smallpox in the 8<sup>th</sup> century, which consisted in the inoculation of smallpox pus from a mature pustule of a person with smallpox and led to a smallpox disease in mild form. Chinese invented another technology of variolation in the 10<sup>th</sup> century, which consisted in breathing the material of smallpox in powder form (using the jet) and applying a smallpox jet to human skin. Mostly rich girls, teenagers, and children have been vaccinated in order to preserve their beauty from the scar of smallpox. Variolation as a primitive method of vaccination was spread in Africa, Scandinavia, and Türkiye [25].

However, in the times of the Age of Discovery, the rate of smallpox spread was very intensive: for the first time, cases of infection with this disease were found in Indian tribes of North and South America, as well as among French Jesuits and English immigrants in Canada and Massachusetts in 1625-1633 [21]. Due to the large emigration of Portuguese colonizers to India, there was an outbreak of smallpox in 1545, which led to 8000 deaths of children. It's important to note that an epidemic of yellow fever, in addition to smallpox, was developed in Central America (Barbados, Cuba, Yucatán), which has led to the establishment of severe quarantine restrictions for immigrants from Europe to the West Indies in Boston in 1648 [1; 21]. However, the first case of inoculation against smallpox recorded as a folk method of protection against infection with the disease in Thessaly, which now belongs administratively to Greece, and later in present North Macedonia.

The Chinese emperor Xuányè (1654-1722) from the Qin dynasty encouraged him to make variolation against smallpox for his subjects after he suffered the disease [21]. A famous English doctor, "a father of clinical medicine" Thomas Sydenham (1624-1689) published his work "Observationes medicae circa morborum acutorum historiam et curationem" (translation – Medical observations on history and treatment of acute diseases) in 1667, in which he in detail described measles and its difference from smallpox and scarlet fever [17]. A medical brochure about smallpox was published in 1678 in response to the epidemic in New England [21]. In 1684, Thomas Sydenham noted that the mortality from smallpox in rich people, as it turned out, was higher than in poor ones. He concluded that acute treatment, such as bloodletting from the tongue, could be harmful because it was accessible only to rich people [21].

In 1673, Denmark first practiced variolation against smallpox, but Turkish and Greek scientists made a significant contribution to the development of human vaccination and the creation of rules for the correct use of vaccine against smallpox at the end of the 17<sup>th</sup> century and at the beginning of the 18<sup>th</sup> century. Initially, the practice of variation in the Ottoman Empire was used only in some regions: well-known Christian Ali Chelepi widely used this method in Adrianople in 1657 [19]. It was also spread in the regions of Thessaly, Macedonia and Thrace. A Turkish doctor, Jakob Pilarinos, who will be discussed below, wrote in his letters in 1716 that a Greek woman first had made a vaccination in Constantinople in 1660. In 1670, Circassian traders established a variolation in the Ottoman Empire. Women from the Caucasus, who were in huge demand in the harem of the Turkish sultan because of their legendary beauty, were variolated in those parts of body where there were no scars in childhood. To protect children from the spread of this disease, fortune-tellers, mainly Turkish and Caucasian nationalities, dried their liquid from the pustule of patients, who suffered from smallpox, and made scarification of child's skin, forehead, and cheek. Inoculation was widely used by poor Christians, until this practice did not generally spread to the entire Christian community during the severe epidemic of smallpox in 1700. In 1711, the French agent of the Swedish king Charles XII Aubrey de La Mottraye (1674-1743), during his round-the-world voyage towards Europe and Asia, visited the Caucasus, where he saw in his eyes, how they variolated a five-years-old Adigean girl in the village Degliad. He described the inoculation process: "The girl was referred to a three-yers-old boy, who was ill for this disease (here - smallpox) and in which small pustules of smallpox and small pimples began to fester. Old woman took three needles, tied together, which she, firstly, made a shot to the small girl, secondly, in the left chest against her heart, thirdly, in the belly button, fourthly, in the right palm, fifthly, in the bone of her left

leg, until the blood has flown out, from which she had mixed pus, pulled out of the boy's small pustules" [26]. Later, the Greek scientists Emanuel Timonis from the Chios (1669-1720) and Jakob Pilarinos from Kefalonia (1659-1718) actively promoted propaganda of inoculation among the population and described the variolation process in the Ottoman Empire, while ensuring the safety and effectiveness of vaccination [8].

The impetus for active research of vaccination was the visit of a noblewoman with four children to Jakob Pilarinos during the smallpox epidemic in 1707. The purpose of visiting the doctor was the authenticity of the folk methods of inoculation, used by fortune-tellers. As it turned out, a detailed description of time, place and vaccination convinced the scientist that natural and visible ways of inoculation provided efficiency from smallpox spread. Jakob Pilarinos collected all data about the inoculation of people in the Ottoman Empire for some years and published his work with the permission of the Venetian Catholic government "Nova et tuta Variolas Excitandi per Methodus; Nuper inventa & in usum tracta: Qua rite per acta immunia in posterum praeservantu ab huius modi contagio corpora" (translation from the Latin language – A new and safe method of treatment of smallpox through variolation; recently discovered and easily applied, keeping the rest of the body not impressed with such infection), in which he pointed out not an invention of inoculation, but its effectiveness from smallpox disease [6].

Emanuel Timonis was vice-rector of the University in Padua in 1691 and defended his doctoral degree in Oxford. He published his works "Istoria variolarum qua per incisionem excitantum" (translation from the Latin language - "The history of smallpox, cured by cutting") in 1715, and "Tractatus de nova variolas per trasmutationem excitanti method" (переклад - "Tractate on the latest findings about vaccination against smallpox using scarification") in 1721 in Leiden, in which he described conducting experiments of vaccination in Constantinople and Chios [14]. The scientist pointed out that folk methods of vaccination against smallpox had some medical basis, but considered that it was necessary to systematize observations on different methods of inoculation to determine, which of them were effective, and which not [6]. British people did not accept the methods of inoculation properly because of trust in folk medicine, which led to a slow temp of vaccination in England.

However, the above-mentioned works of Timonis and Pilarinos became popular in Europe and were actively used in different countries and colonies. For example, an American surgeon Zabdiel Boylston (1679-1766) first in Boston used the inoculation methods, relying on the work of the above-mentioned Greek scientists, when the pandemic of smallpox happened. A minister of Boston Cotton Mather (1663-1728) saw in 1706 that an African slave Onysim, who was given to him from present northern Libya in 1707, had a scar from smallpox, and found that the scars of many slaves were diverse and considered as immune to this disease. It was confirmed by another minister Benjamin Colman (1673-1747), who described his conservations with several slaves who were also held in Africa. Later, Mather read about the methods of variolation in English journals and publicized practice in Massachusetts [21]. As a result inoculation became compulsory for the population in English colonies in America during the epidemic of smallpox. A doctor from Geneva Théodore Tronchin (1709-1781) after studying at Cambridge University, demonstrated the process of inoculation in Switzerland, and the Greek patriarch publicized methods of variolation in Greece. France practiced methods of vaccination in 1712, but the French parliament banned their use in 1763 [23].

Having learned about the works of Emanuel Timonis about variolation, poet and wife of famous English ambassador in Constantinople in 1716-1717 Sir Edward Wortley Montagu (1678-1761), Mary Wortley Montagu (1689-1762) got acquainted with a black woman who in detail described time, place and procedure of vaccination. She described the inoculation process in her letters: "There is a set of old women, who make it their business to perform the operation, every autumn, in the month of September, when the great heat is abated.

People send to one another to know if any of their family has a mind to have the small-pox; they make parties for this purpose, and when they are met (commonly fifteen or sixteen together) the old woman comes with a nut-shell full of the matter of the best sort of small-pox, and asks what vein you please to have opened. She immediately rips open that you offer to her, with a large needle (which gives you no more pain

than a common scratch) and puts into the vein as much matter as can lie upon the head of her needle , and after that, binds up the little wound with a hollow bit of shell, and in this manner opens four or five veins. The Grecians have commonly the superstition of opening one in the middle of the forehead, one in each arm, and one on the breast, to mark the sign of the Cross; but this has a very ill effect, all these wounds leaving little scars, and is not done by those that are not superstitious, who chuse to have them in the legs, or that part of the arm that is concealed.

The children or young patients play together all the rest of the day, and are in perfect health to the eighth. Then the fever begins to seize them, and they keep their beds two days, very seldom three. They have very rarely above twenty or thirty in their faces, which never mark, and in eight days time they are as well as before their illness. Where they are wounded, there remains running sores during the distemper, which I don't doubt is a great relief to it" [21]. As a result, Lady Montagu made variolation to her six-year-old son with the help of a local fortune-teller in the presence of the Scottish doctor and ambassador Charles Maitland (1668-1748) in 1718. Thus, her son became the first British person who was vaccinated against smallpox. Convinced of the effectiveness of vaccination, she again appealed to Charles Maitland to vaccinate her two-year-old daughter under the supervision of doctors from the Royal College of Physicians. As a result, the President of the Royal College of Physicians in 1719-1735 and the 13<sup>th</sup> President of the Royal Society Hans Sloane (1660-1753) approved inoculation in the United Kingdom. Thus, April 21, 1721 is considered the date of the first variolation in England [11]. Despite critical comments on the propaganda of variolation, the whole of Europe massively began to use methods of inoculation in 1720s: it practiced in Wales, Ireland and Germany [11]. Meanwhile, Lady Montagu actively publicized inoculation, visiting patients and publishing stories about inoculation methods in London and local newspapers. As a result, two daughters of the Princess of Wales variolated from smallpox in 1722, and later George I and his family also variolated.

In the first 8 years, 847 people were vaccinated in England, 17 of whom had fatal consequences. However, variolation did not have a tangible result because of the lack of qualified fortune-tellers, charlatans, and doctors, which led to the great spread of smallpox in England. Later Italian doctor Angelo Gatti published the instruction of proper inoculation, but the variolation lost its relevance: Denmark massively vaccinated at last in 1778, permission for inoculation was in effect until 1840, and the last European country, which carried out variolation among its population in 1896, was Italy [25]. Vaccines against smallpox, polio and other diseases were invented in contrast to inoculation [11].

People have noticed since the Middle Ages that the milkmaids, who have suffered on a cowpox, have never been ill with smallpox. There was even a popular English adage about this statement, and it became a subject of a detailed scientific research of English doctors and scientists in the end of the 18<sup>th</sup> century. An English pharmacist and doctor John Fewster (1738-1824 pp.) noted in 1763 that two brothers were vaccinated against smallpox without inoculation. They replied that they had never been ill with smallpox and had contact with a cow, who had cowpox. Later on, Joseph Wallis, Daniel Ludlow, and young Edward Jenner, who will be discussed below, gathered at the time over dinner to find out, what was the emergence of immunity from the injection of a person who had suffered from cowpox. John Fewster presented his scientific work with the results of his research "Cowpox and its ability to prevent smallpox" in 1765, but the London Medical Society did not recognize his research as plausible, considering that it was a coincidence [15].

Regardless of John Fewster, the results of Daniel Sutton were not recognized at that time [2]. Later, an English daily farmer from rural Dorset (Yetminster) Benjamin Jesty (1736-1816) decided to make sure that the above-mentioned adage was true in 1774, when the epidemic of smallpox lasted: his wife, Elisabeth, and his two sons, Robert and Benjamin (two and three years old respectively) have never had a smallpox, so they were at risk. He decided to inoculate them, using material, based on cowpox blisters. As a result, his sons had no complications, but his wife's hand was infected, so he had to call a local doctor. The spontaneous inoculation caused an indignation among rural population, so family had to move from rural Dorset.

As a result, the farmer convinced of the plausibility of this adage. Benjamin Jesty wasn't going to experiment with inoculation, until he was invited to Original Vaccine Pock Institute in July 1805. Then his experimental results were recognized by many English medical societies [15].

A German teacher Peter Plett (1766-1823) also successfully conducted vaccination against smallpox and presented the results of his research at the medical faculty of Cologne University in 1790-1792 [7; 15]. Later, the English scientist Edward Jenner (1749-1823) decided as Benjamin Jesty to convince of the plausibility of the adage on May 3 (14), 1796: he found a young milkmaid Sara Nelms, who was infected with cowpox, and the scientist publicly and with the presence of doctors, vaccinated her eight-year-old son, James Phipps, using substance from his mother's injuries from cowpox. Later, the boy had a slight temperature and discomfort in the axilla. He felt cold and lost appetite nine days after vaccination, but he felt better the next day. Edward Jenner traditionally inoculated another patient in July. In both cases smallpox did not appear [18]. He sent a message about the description of its research and experiments to the Royal Society of London, but it was rejected. Having added several cases to his initial experiment, Jenner privately published a small brochure "An Inquiry Into the Causes and Effects of the Variolae Vaccinae, a Disease Discovered in Some of the Western Counties of England, Particularly in Gloucestershire, And Known by the Name of Cow-pox", that brought the scientist world fame. He noted in his work that cowpox and smallpox are two forms of the same disease, so transmitting cowpox gives an immune response to smallpox.

The publication of this brochure has caused a mixed reaction in the medical community, but he first introduced the concept of "vaccination", which came from the Latin word "vacca" which meant "cow". Edward Jenner is considered the inventor of the first vaccine against smallpox. Subsequently, his brochure was translated into 6 languages, and the number of vaccinated people reached more than 100000. The term "vaccination" was used by Plymouth surgeon Richard Dunning in his work "Some observations on vaccination" as a process of inoculation with the use of cowpox [26]. Edward Jenner tried through volunteers to deliver a vaccine from cowpox to different English colonies. For example, the vaccine was delivered through a Vienna supplier Jean de Carro to Mumbai (India) in 1802, and a Scottish surgeon Helenus Scott (1760-1821) presented to Indians E. Jenner's vaccine, made of limphe of Swiss cows, who were suffering from cowpox, and vaccinated dozens of children on July 14, 1802 [5]. In 1803, the vaccine was delivered to Ceylon (due to high incidence of smallpox, 2110 cases recorded, of which 477 were fatal, in 1800-1802), Calcutta and other British colonies. In 1807, the number of vaccinated people in India and Ceylon reached a million people. The vaccine from Boston appeared in Thailand in 1840. In 1800, vaccination became compulsory for land and sea troops in England [26].

The Spanish king Charles IV ordered all population to be inoculated by the old method on November 30, 1798, and subsequently by the method of Edward Jenner in 1800 because of the high incidence among the royal family Bourbon in Spain and Portugal. In 1802, there was an epidemic of smallpox in Santa Fe in Colombia, and then the Spanish king convened the Council of Indians (in Spanish - Consejo de Indias), which discussed the issue of vaccination of the population of Spanish colonies in North and South America. The Catholic clergy had to control the vaccination. An official decision was made to conduct a vaccination expedition to America to vaccinate people on March 22, 1803. A Spanish surgeon and supporter of vaccination ideology Francisco Javier de Balmis (1753-1819) led the expedition. 22 boys, who were infected with cowpox, were participants in the expedition to vaccinate the population, using a living chain. The main purposes of the expedition were: 1) to explain the advantages of vaccination; 2) to provide local production of cowpox lymph; 3) to introduce the vaccine; 4) to document immunizations and keeping registers; 5) to develop the monitoring system of the vaccine side effects. This expedition lasted for three years, and people from Peru, Philippines, Venezuela, Bolivia, Chile, Argentina, and the Portuguese colony in China Macao were vaccinated [4].

Vaccination was conducted in Mauritius, Mozambique by Portuguese doctors in 1803-1804. In 1807, Bavaria became the first country in the world, where vaccination was compulsory for population [26]. An English veterinarian William Moorcroft (1767-1825) publicized the vaccination in Nepal and Tibet in 1811,

and the rulers of these countries used it to avoid further smallpox epidemics during the epidemic in 1816 [1]. In 1817, Sweden committed to vaccinating children under two years of age.

Prussia conducted the vaccination in 1810-1829, and the Serbian Prince Michael was vaccinated first in his country in 1826. In 1836, an English surgeon Edward Ballard (1820-1897) introduced more effective vaccine against smallpox [27].

In 1837, smallpox epidemic in the UK prompted the British government to create a special normative act that would set the requirements for vaccination among the population. The Vaccination Act was created in 1840, which prohibited the use of traditional method of variolation and introduced free-of-charge vaccination against smallpox for all that wished. In 1853, an amendment was adopted, which included mandatory vaccination in Wales and England. In 1853, 1867, and 1871 certain changes were made to the act, in particular, a fine of one pound sterling was provided due to the refusal of vaccination of the adult [16].

At that time, the certifications of vaccination appeared: confirmation that the person had been vaccinated was a mandatory condition for travelers in the end of the 18<sup>th</sup> century in the East. It caused mostly pilgrims, traveling to cities such as Pandharpur in British India or Mecca during Hajj. The certificates of vaccination as evidence that a citizen was vaccinated were used in the Ottoman Empire at the end of the 19<sup>th</sup> century. It spread to the USA at the beginning of the 20<sup>th</sup> century.

The end of the 19<sup>th</sup> and 20<sup>th</sup> centuries is the era of the invention of vaccines against different diseases. A famous French scientist Louis Pasteur invented vaccines against anthrax (1879), cholera, plague, rabies (1885), and the bacteriological station in Odesa, which was the second in the world after France (led by Louis Pasteur himself) was created, headed by Ukrainian-Jewish scientist Élie Metchnikoff (1845-1916). It specialized in the development of vaccines. He emphasizes the benefits of vaccination in his priceless works: "It has become generally accepted in a few years that the relaxation of viruses as well as the vaccination using weakened microbes is a real fact, which cannot be refuted from now in no way and which should be passed into the sphere of finally established truths" (1901, «Immunity in Infective Diseases»), reminds "raw materials" against diphtheria and tetanus in his work "Etude About Human Nature" (1903) and supports Louis Pasteur in the continuation of vaccine development [21].

Professor of Lviv University, Head of the Department of General Biology Rudolf Weigl (1883-1957) invented a vaccine against epidemic typhus in 1920. Alexander Thomas Glenny and Barbara Hopkins invented a vaccine against diphtheria in 1923.

Maurice Ralph Hilleman invented vaccines against measles, hepatitis A & B, chickenpox, and other diseases [3]. Jonas Salk invented a vaccine against polio in the middle of the 20<sup>th</sup> century. Thanks to the vaccine inventions, the WHO launched a worldwide public vaccination campaign in 1959. The first disease, which was eliminated due to mass vaccination, was smallpox in 1980. In 1974, the WHO adopted a resolution that focused on conducting a campaign to protect the population from polio, diphtheria, measles, pertussis, rabies, and tuberculosis by 1990. As a result, from 20 to 40% of the population of developed countries were vaccinated against 6 diseases in the 1980s. The issue of achievement of 80% of the people, vaccinated against COVID-19, remains topical, and world society urges vaccinate against coronavirus as one of the key aspects of health preservation with the help of mass media, speeches of heads of different states, and resolutions.

## CONCLUSIONS

The history of human vaccination proves that vaccination is one of the key elements of preservation the physical activity, because the lack of health preservation leads to changes in the physical potential of a person and deformation of the spiritual aspects of a healthy way of life, which significantly affects the quality of life in the future. Physical activity strengthens the first line of protection of the human immune system and increases the concentration of immune cells, which shows that there is a link between physical activity and vaccination. It is the ambiguity in the perception of the leading scientists of the world and ordinary people of the effect of vaccination, the failure of vaccination campaigns in various countries, and

the spread of antivaccination that have led to a long-term international vaccination campaign to curb the spread of the natural virus. The problems that existed during the long period of vaccination against the diseases and today prevent the return to the usual life of citizens of different countries in economic development. That is why the awareness of the importance of vaccination in the further development of humanity, both in economic, social, and health-friendly aspects, will help to stop the spread of the coronavirus, and in the future – to complete the pandemic period.

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## THE CONCEPT OF COLOR IN THE PHRASEOLOGICAL UNIT “GREEN TEA” IN ASIAN LITERATURE

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### **ABSTRACT**

*Colors were closely connected with the life of peoples and became an integral part of their cultural and civilization heritage. Each color has a meaning that depends on different cultures and peoples. Different stories and customs were associated with these colors. In addition to the universal features of the “color system”, due to common origin and uniformity mental processes, different cultures have different relation to a particular color, fixed in the secondary nominations, stable comparisons, phraseological units in the strength of their ability to accumulate sociological, historical, intellectual, emotional information about the character of the nation. One of the important means of expressing national mentality is phraseological unit with color component. Asian literature brought us so called “Manga” which came from Japan and becomes popular nowadays, creating such genres as web manga and webtoons. Sometimes Asian novels are based on manga and vice versa. The concept green, which combines in itself a symbol of youth, naivety, joy of life together with jealousy and wickedness and resulted in such expression as “green tea”. Whereas according to the Urban Dictionary, the slang term “Tea” comes from “the custom in the South of women who gather in the afternoon to drink tea and gossip”. In webtoons, manga and novels the “green tea” has become one of the popular types of negative characters which refers to a woman who presents herself as innocent, sweet, and kind in order to approach guys who she finds useful, potentially in the sense of money, power, or purely fulfilling.*

**Keywords:** *concept of color, “green tea”, manga, webtoon, web manga, novel.*

### **INTRODUCTION**

The novelty of this article is important due to the fact that the concepts of color provide an important significant information about the value hierarchy of the language community and contribute to the creation and development of the concept of “color picture of the world”. So, it is very important to study color from the standpoint of linguoculturology. The article presents an analysis of green color concept sphere, realized in phraseological unit “green tea”.

The objectives of the research were to conduct a comparative analysis of phraseological units with a color feature and color terms in English and Asian languages and identify their universality, difference and uniqueness in compared linguistic cultures.

The most striking confirmation for this theory can be considered the phraseological corpus of languages, since a figurative (and connotative) meaning is realized in phraseological units and verbal phrases. Therefore, as a material for analysis we chose the phraseological units with a color concept “green” and colour designation words extracted by the continuous selections from the translated Asian novels, webtoons, manga, manhwa, manhua and webmanga, webcomics into English language.

### **METHODOLOGY**

The methodological and theoretical basis of the study was scientific works in the field of Cognitive Linguistics (G. Lakoff, M. Johnson, V. Evans), Color Linguistics (P. Kay, R. Brown, E. Lennenberg, J.A. Lucy, B. Saunders), slang (J. Green, M. Adams, C. Eble, E. Mattiello, J. Amari, B. K. Dumas, J. Lighter, A. Lillo, M. Garcarz, L. Soudek), etc.

The purpose and objectives of the work determined the choice of the following methods of analysis: semantic analysis, cognitive analysis, elements of etymological analysis, comparative analysis, interpretive analysis.



Colour is one of the ways of understanding and studying the world. Colours are connected with human consciousness, occupy in it certain parts. The problem of color concept and color naming in language has been studied by many researchers from different points of view.

The system of colour concepts that make up the concept sphere of colour, is a means of orientation of a person in the surrounding world and shows a color picture of the world. Verbal explication of colour forms a linguo-colour picture of the world. The linguo-colour picture of the world is a set concepts of colour, which received an explication by lexical means and have an element of colour naming in their semantics. As language expression and division of the colour space are not the same in different language systems, which depends on the natural and climatic living conditions of people, as well as cultural and historical events and social conditions for the development of society, then the national specifics of linguo-colour pictures of the world can be discussed.

## RESULTS

### *Meaning of the green colour*

Nowadays, people pay attention to colours in different aspects. "Language, culture, and colour: How do they fit together? Does every language have the same number of words for each colour, or do some languages identify colors with more words, or less words? Such as *blue* and *green*, some languages may recognize *blue* as a shade of *green*. While in English, *green* may often be an all-encompassing term for many shades, though some languages may distinctly and consistently differentiate these shades in everyday use. Can this affect perception of color or ease of identification? I believe that difference in the quantity of words for certain colors, may in some ways, affect identification of color for the user of that language. More so, what if a language does not have specific color words? Perhaps it's possible to express sensory experiences pertaining to color without using a color term itself" [1].

*B. Berlin and P. Kay* allocate the common regularity of the appearance of colour names in the language, explaining the differences in the color palettes of different languages by the development of language and culture in general. If there is no designation for any colour in the language, it means that the language community is at the stage where it lacks such a need. In the study of B. Berlin and P. Kay, there is an attempt to connect the language with culture and the way of life of the ethnic group. However, the disadvantage of their approach is that they did not take into account the fact that, despite the objectivity of color as physical characteristics of an object, its perception by different cultures is subjective [2].

Almost all peoples have noticed the convenience of using colour as symbols. But, based on the different conditions of the existence and development of civilizations, one and the same colours in different nations symbolize different phenomena. However, there is a classical folk tradition in the European symbolism. Individual ideas, impressions and feelings are associated with color designations. Based on the symbolism of colour, semantic micro-systems of symbolic values of colour was created. For example, *green* color. The semantic content of the microsystem is "allowing": *green light* — permission to do something, *to give somebody a green light* — to give someone a permission. The *green* color, has other symbols such as a symbol of youth, naivety, joy of life. For example, *green youth* means inexperienced young people, not yet mature; *to see green in someone's eyes* – to think someone is naive, *green horn* – a person who lacks experience or sophistication). So, in the visual arts, *green* symbolizes hope, joy and youth.

In heraldry, *green* colour means joy and abundance, and is also a symbol of love, which is often mixed with jealousy. So the key idea is that one of the components of the meaning of the adjective "*green*" in English and Asian languages is "jealousy": *the green-eyed monster* – jealousy, *green-eyed* - jealous, *look through green glasses* – to be jealous.

### *Manga, manhwa, manhua, webtoons in modern society.*

In recent years, the popularity of manga has increased. "Manga are comic books created in Japan using their specific style of drawing characters. Everyone in Japan reads manga; it is a very popular art form that

features every genre one can imagine. Their popularity in the west has been growing for the past few decades. Manga should not be confused with anime, which are Japanese animated shows and movies. However, many anime (animated shows from Japan) are adapted from a manga source.

The manga industry is huge, with certain series rivaling even the comic book titans such as Spiderman in sales. Artists in other parts of the world are greatly inspired by manga. Some countries even have comic books that are so under the influence of mangas that they make up their own category. Some examples are “manhwas” in South Korea and “manhuas” in China” [3].

By 2007, the influence of manga on international comics had grown considerably over the past two decades. "Influence" is used here to refer to effects on the comics markets outside Japan and to aesthetic effects on comics artists internationally.

Traditionally, manga stories flow from top to bottom and from right to left (Many East Asian scripts can be written horizontally or vertically. Chinese, Japanese, Vietnamese and Korean scripts can be oriented along either axis, as they consist mainly of disconnected logographic or syllabic units, each occupying a square block of space, thus allowing for flexibility for which direction texts can be written, be it horizontally from left-to-right, horizontally from right-to-left, vertically from top-to-bottom, and even vertically from bottom-to-top [4]). Some publishers of translated manga keep to this original format. Other publishers mirror the pages horizontally before printing the translation, changing the reading direction to a more "Western" left to right, so as not to confuse foreign readers or traditional comics-consumers. This practice is known as "flipping". For the most part, criticism suggests that flipping goes against the original intentions of the creator (for example, if a person wears a shirt that reads "MAY" on it, and gets flipped, then the word is altered to "YAM"), who may be ignorant of how awkward it is to read comics when the eyes must flow through the pages and text in opposite directions, resulting in an experience that's quite distinct from reading something that flows homogeneously. If the translation is not adapted to the flipped artwork carefully enough it is also possible for the text to go against the picture, such as a person referring to something on their left in the text while pointing to their right in the graphic. Characters shown writing with their right hands, the majority of them, would become left-handed when a series is flipped. Flipping may also cause oddities with familiar asymmetrical objects or layouts, such as a car being depicted with the gas pedal on the left and the brake on the right, or a shirt with the buttons on the wrong side, however these issues are minor when compared to the unnatural reading flow, and some of them could be solved with an adaptation work that goes beyond just translation and blind flipping [5].

Nowadays we can find such varieties as 漫画 (manga), 漫畫 (manhua), and 만화 (漫畫 manhwa), etc. So, the what is the difference between them? While reading East Asian comics, you can encountered many different terms. The difference between manga, manhwa and manhua is based on the country they came from. So, manga is from Japan, manhwa is from South Korea, while manhua is from China, Taiwan, or Hong Kong. Taking into account today's attitude and attention to this kind of literature let's take into consideration the views of ordinary readers on quora.com, who are the consumers of this product and influence on its increasing popularity, widening of genres and forms [6]. So, according to the viewer Rahil Mohan , who Studied at Delhi Public School, R.K. Puram (Graduated 2017) (5y), Ankit Kumar Rawat who is Village Development Officer at Government of Uttar and Masters in Sociology (has read more than 172 mangas and counting Author has 72 answers and 197.6K answer views 2y ), viewerMina Anugrah (watched 50 animes Author has 339 answers and 434.2K answer views 4y), Vigneswara, a Site File Operations Specialist, Kochi, Kerala (Read over 400 books across assorted Genres Author has 162 answers and 321K answer views Updated 1y), Sohith D. (Read a lot of manhwa. Author has 85 answers and 140.6K answer views 1y), Raunak Sapkota (I watch a lot of anime Author has 302 answers and 4.9M answer views 5y), etc. [7]:

**1. Manga** is multi-panel, almost always black and white (often with full colour first pages) and is read from right to left. The plot is super wide where you can find a lot of genre in this type of comics, among which are Shounen, Shoujo, Seinen and Josei (for example, **Death Note**, **Tokyo Ghoul**, **Naruto** and **One**

**Piece** ). Most manga style developed in Japan at the end of the 19th century, although the art form has a long prehistory in Japanese literature. In Japan, the term manga is used to refer to comics and cartoons. Outside of Japan, the term is generally used to refer to comics originally published in Japan. Manga is harder to make, since it needs shading and an actual good sketching.

**2. Manhwa** is usually horizontal, left to right, can be vertical and is read from right to left and top from bottom. They consist of computer generated webtoons and traditional black and white novellas (for example, **Noblesse, The Breaker, Solo Leveling** ). Manwha is a general Korean word for comics and print cartoons (common use also includes animated cartoons). Outside Korea, the term typically refers to South Korean comics. Nowadays, the names in Manwha is in Korean, well colored, and the plot usually has elements of comedy (so that we are more enjoyable when read this type of comics) also the genres are pretty wide (there are some isekai genre, comedy-romance, etc). According to viewer Runa who has 131 answers and 268.8K answer views and was updated Nov 11, manhwa tend to overuse cliché plots a lot: sometimes the authors change the storyline a little but still have a lot of the same plot points. She writes that they have over-dragged storylines. She thinks that manhwa authors/artists are paid per-episode/chapter, so they will stretch it out as much as possible and will also add a lot of useless plot points that it feels like a filler. Manhwa usually have totally different digital art because they were allowed to grow independently due to the ban of Japanese manga in Korea until 1990s. Manhwa are often fully colored because they don't have to be printed in expensive ink and are usually read online. Famously known as webtoons or webcomics.

**3. Manhua**, word from where Manga and Manwha are derived is full coloured with some panels which are almost entirely in paint and has a single issue format. It has realistic drawings of people and environment and read from right to left (for example, **Song of the Long March, Prince, Martial Peak**). These Chinese comics are produced in China and the Greater China region. Although Chinese comics and illustrations have existed in China throughout its history, the word 'manhua' first appeared in 1904 in a comic titled 'Current Affairs Comics' in the Shanghai-based newspaper Jingzhong Daily. Mostly they use Chinese names, and all scenes are well colored and the plot is usually about CEO, reincarnation, etc. The viewer Vigneswara states that generic & subpar manhua titles are flooding the market with uninspired storylines in large numbers, which is affecting the reading quality and lowering their standards in the eyes of readers. Tushar Kaushal thinks that manhua stand out from others in the level of detailing and details in the background. He points that the first pages are often beautifully hand painted, and so are the key moments. Rongo Rem says that Chinese stories follow some sort of guideline that includes [7]:

- a) Japan: Bad
- b) Americans: Arrogant
- c) Africans: Poor and useless

Implying that China is only the best nation in the world and that other nations are automatically bad, except when they're half Chinese and get accepted into MCs Harem. He says that Manhua are wasted potential. If they had focused on making use of their tropes properly then he wouldn't have said this.

So, mostly the differences have already become widespread because of the culture, where we can see a lot of differentiations based on the culture itself. Also, in some way, according to viewers, there a lot of racism and misogyny. In Japan, they adore so called “weak” and “cute” girls, depending on a type and taste, a misogynist one. They love so called Tsundere-types and dandere-types of girls. In Korea there is a straightforward kind of sexism. The viewers also mention racism. According to them there's a lot of racism and toxic nationalism in manhwa. The key idea that the nationalism becomes toxic at this point: the authors paint other countries as bad, lazy villains, while painting Korea as a victim, weak (because of other countries), and “the best”. Also manhwa according to viewer Runa, really shines in romance. She states that she found romance in Manhwa better than manga: maybe because the romance in general has already it's “formula”, so manhwa authors can use it to the fullest potential adding their own quirks. According to Tushar Kaushal, “Manga and Manhua make a very good use of of their spaces and pages and try to make a very good use of the space they are allotted with and try to add as much content as possible while Manhwa is

pretty liberal about its spacings and does not shy away from adding blank pages or pages with almost near to no art or anything. also their panels are loosely spread around” [7]. South Korea’s manhwa makes impact on the Asian-comics market, especially online. Many people expect it to grow as the global impact of comics grows.

With the development of the internet, the digitalization of society the mangaka got the opportunity to upload and sell their manga online. It influenced the creation of web manga and webtoons. This phenomenon originated in Korea in 2000 when Chollian Webtoon launched an online comics platform. It was filled with the scans of print comics which differed from today's webtoons. At that time, comics with non-linear narratives arose. Although being different from nowadays’ stories, they are considered to be pioneers and have cemented vertical scrolling when reading from a smartphone and computer for the next generations of digital stories in pictures. The improvement in the quality of webtoons coincided with important changes that caused them to move to a paid basis in 2012. Access to the webtoon became paid, and 90% of the proceeds were returned to the author. Paid content is not only about making a profit for the publisher, but also the only possible way that will help to make the uninterrupted production and consumption of webtoons. Also since the mid-2010s, the genre assortment of comics has expanded, which gave the authors new possibilities. So, currently there is a great expansion of Korean, Chinese and Japanese publishers into the global digital market. Nowadays dramas, animated series, and movies are based on webtoons.

If we talk about South Korea, over half of Korean 만화 today are published online as either Webtoons (웹툰), free Webcomics, or digital Manhwa, while the rest is published in an offline format making up about 25% of all book sales in South Korea [7].

So, “unlike real manga, webmanga are designed for online consumption, most likely on panel-pages, or video format. They can have similar themes to real manga, or to LINE Webtoons. In video format, these tend to look like storyboards. This is different to a webcomics as the style aims to be as close as possible to a real manga, whereas webcomics are usually more western-styles. Most LINE webtoons are therefore webmanga”[8].

As manga, web manga and webtoons becomes popular, they are translated into many languages, especially English. Webtoons are much more comfortable to read on your phone. A lot of Korean comics are also in full colour which can appeal more to a Western public. According to Daniella Orihuela-Gruber who is travel agent, world traveler, occasional manga editor (Freelance Manga Editor, off and on since 2010 Author has 133 answers and 337.5K answer views 4y), webtoons, which are a form of manhwa, have been formatted to be read on your mobile device. “There are lots of webtoons out there and many of them will never be collected into a physical print version and published that way. Since that’s the case, why bother with the mechanism of turning pages? In a digital format, that’s often a more complicated task than it needs to be. You need to find and press a button, which might cause all kind of problems for the reader. Hence, why webtoons are made longer, so you can just easily scroll down to continue reading [9]”. She writes that Webtoons aren’t the only form of manhwa out there, but it’s just one of the more popular and prevalent kinds nowadays. According to her professional point of view, there are many manhwa that are intended to be printed first and are drawn in short pages, the same thing with a printed book would be.

### ***The impact of YouTube on manga, manhwa, manhua, webtoons and novels.***

According to Google: “YouTube is ever-changing, whether it's “borrowing” features from other platforms, finding new ways to monetize, or making the platform more accessible to creators and viewers. If YouTube continues on the current path, the future will include more streaming, more eCommerce initiatives, and more immersive experiences” [10]. “The powerful content distribution platform encourages people to connect and inspire others through big and small content creators and advertisers. More so, YouTube is leaving no stone unturned in improving its software with latest features and updates for the masses” [11]. For example, the masterpieces of the famous Japanese mangaka, Junji Ito, who strikes his readers with the fear

of the unknown. His stories provide only enough information to frighten us, and then we are left to our thoughts to find answers to the fear that comes from something we are well-acquainted with, but still don't understand. As you will see, this YouTube video has 10 k likes and 328 047 views:



**Fig. 1. YouTube video “9 Deranged And Nerve-Wracking Junji Ito’s Twisted Stories Explained - Japan's Master Of Horror!” [12].**

Nowadays people come to it with a specific goal: to have fun, to find out something, to learn. Having stumbled upon a video, it is important for the user immediately to understand its specifics. So, you can choose, at least, 1-3 formats that will be the basis: talk show, challenge, podcast, lectures, product review. So, more and more content-users are into watching voice-acted and animated manga, manhwa, manhua or webtoons. Content-makers who are mostly young people, who are fond of Asian manga, manhwa, manhua or webtoons try to voice-act and animate them, creating long video (YouTube) and shorts (TikTok). For example:



**Fig. 2. Short from YouTube “Yor being Spiderwoman Shinunoga e-wa” [13]**

In this short we can see that the number of likes is 686 k and 1,9 k comments.

The series “Love In the Palace” was animated and voice-acted in Chinese, but it has English subtitles that helped to achieve 1 k likes and 71 k views in a month:



Fig. 3. YouTube video “Love In the Palace” [14].

The same thing goes with “Master Li's Heartthrob Wife”. It was also animated and voice-acted in Chinese, but it has English subtitles that helped to achieve 2,4 k likes and 129 k views in 4 weeks:



Fig. 4. YouTube video “Master Li's Heartthrob Wife” [15].

The original RomCom Manga “A Scary Punk Girl Started Crying Unexpectedly After I Doodled On Her Face While She Was Taking A Nap” was voice-acted in English subtitles that helped to achieve 3,3 k likes and 27 925 views in 2 hours:

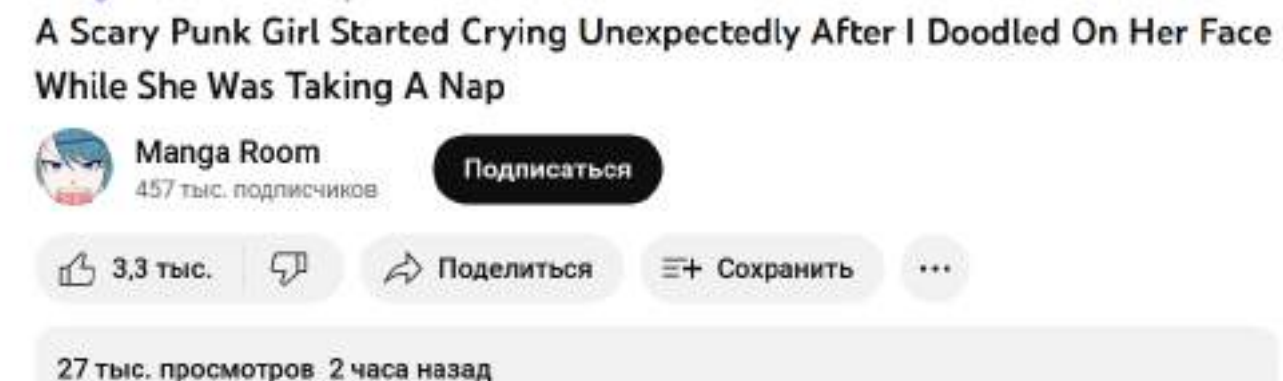


Fig. 5. YouTube video “A Scary Punk Girl Started Crying Unexpectedly After I Doodled On Her Face While She Was Taking A Nap” [16].

Manga “The Son of The Big Company Is Kicked Out by His Little Brother. His Fiancé Helps Him” was voice-acted in English subtitles that helped to achieve 757 k likes and 6,6 k views in 4 hours:

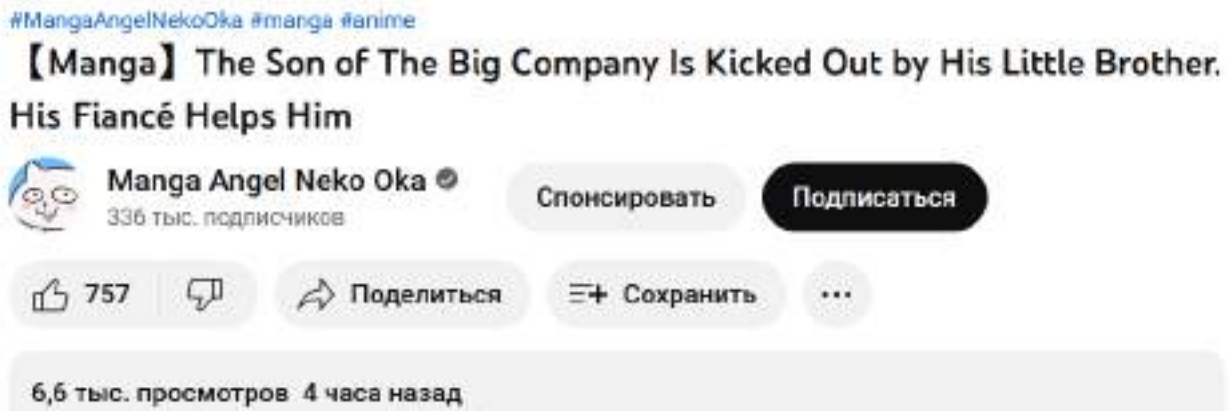


Fig. 6. YouTube video “The Son of The Big Company Is Kicked Out by His Little Brother. His Fiancé Helps Him” [17].

The series 《反派皇子走着瞧》 第1-52集 全集 (完整合集) / "Villain Prince Will See" is animated and voice-acted in Chinese with English subtitles. It’s got 15 k likes and 1 mln views in 9 months:

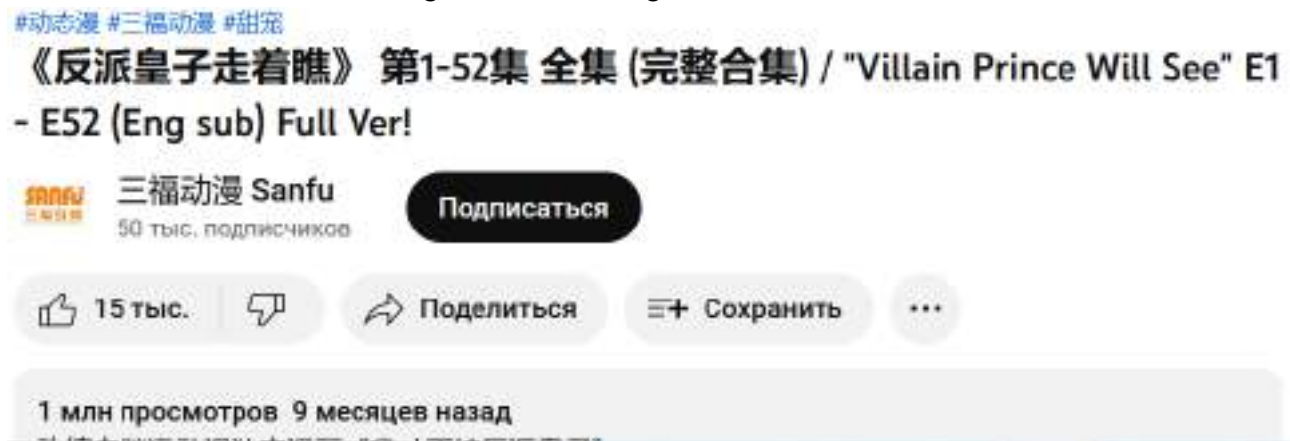


Fig. 7. YouTube video “Villain Prince Will See” [18].

### *The concept of green tea.*

Taking into account the colour concept, let’s pay attention to the novels, webtoons, manga, manhwa, manhua and webmanga, webtoons, webcomics. Colour term is a layer of vocabulary that was studied by linguists from different positions. The interesting connection referring to color terms can be found in non-standard vocabulary, particular, in slang. Colour coding is very ancient units carry the cultural memory of the language community, accordingly, they have some symbolism in the mind of the wearer and are capable of evoke certain associations. Colours are the subject of psychology study because of their ability to influence the psychophysical human condition and the alleged relationship between color preferences and personality of the individual. The close connection of color with consciousness and the ancient history of color words as language units is prerequisite for attempting to reconstruct a fragment of the picture of the world of slang, including the help of analysis color terms.

In the sections of discussion or in reviews, people use such terms as FL (Female Lead) or ML (Male Lead) or MC (Main Character). For example:

Speaking about concept of green colour, let’s pay attention to its usage in our materials of research. Nowadays among the main typical characters of Asian novel we can find so called “green tea” female

characters (due to modern times we can also read about green tea male characters). The concept green, which combines in itself a symbol of youth, naivety, joy of life combined with jealousy and wickedness and resulted in such expression as “*green tea b\*tch*” (*Green Tea Bitch*). Usually it refers to FL or second FL or villain as the opposite one. For example:

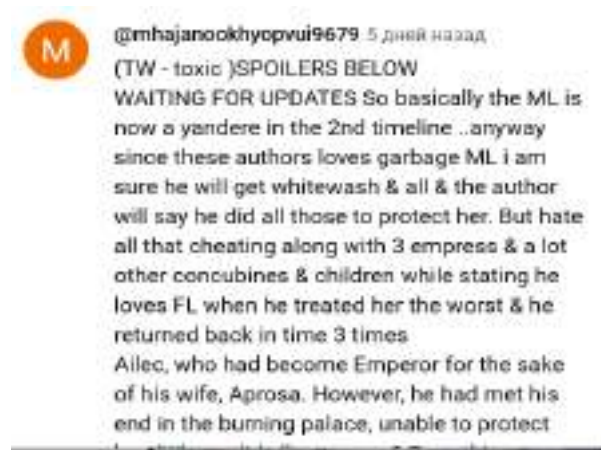


Fig. 9. Comment to YouTube video №1.

According to the Urban Dictionary, the slang term "Tea" comes from "the custom in the South of women who gather in the afternoon to drink tea and gossip." "T" or "Tea" is slang for gossiping about a situation, story, news, or some juicy information. You can give tea, get tea, or spill tea" [19]. For example, in comments you can find:

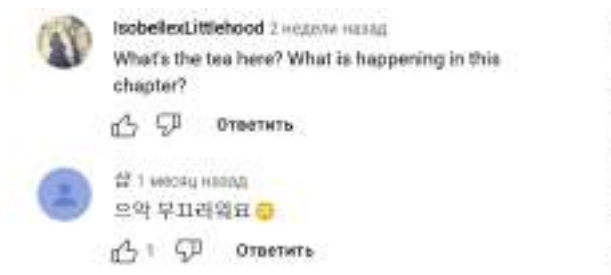


Fig. 10. Comment to YouTube video №2.

According to Urban dictionary “Green tea b\*tch refers to a woman who presents herself as innocent, sweet, and kind in order to approach guys who she finds useful, potentially in the sense of money, power, or purely fulfilling. (This is the *green tea* part). Yet this woman is actually calculating and all her good qualities are fake merely in order to appeal the guy. This woman uses many methods to achieve her goal, usually involves lying and being immoral. (the b\*tch part)” [20].

“This strongly implies that this woman wants to intervene and destroy an existing relationship. “backgrounder The ‘*Green Tea B\*tch*’ – Stereotyping Chinese Women The ‘*green tea b\*tch*’ (绿茶婊) is a new term launched over the Chinese Internet to describe a certain ‘type’ of woman. It is one among series of new terms (*milk tea b\*tch*, *black coffee b\*tch*, etc) that stereotype Chinese women. Manya Koetse Published 10 years ago April 10, 2013 By Manya Koetse In the spring of 2013, a new term was launched over the Chinese Internet [21]: ‘*Green Tea B\*tch*’ (绿茶婊 *luchabiao*). According to Chinese netizens, the term is used to describe ambitious women who “pretend to be very innocent”. Somewhere between March and April of 2013, the term “*green tea b\*tch*” (GTB) emerged on Chinese social media platforms. Weibo netizens



joined in a collective effort to formulate a suitable definition of what a ‘*green tea b\*tch*’ actually is. As a result, a short essay was composed and shared online. The essay lists twenty-four different characteristics of a GTB. ‘*Green tea b\*tch*’ is not the only term to categorize young Chinese women in an overall derogatory manner. Other examples include ‘*coffee b\*tch*’, ‘*black tea b\*tch*’ or ‘*milk tea b\*tch*’. According to Chinese netizens: “*The green tea b\*tch* appears to be very innocent. She normally has shiny long hair, but if it is not long, it is neat, straight, and parted in the middle. She has good looks, but is not exceptionally beautiful. She uses her eyes as her magic weapon to look at men with big bright eyes. She is especially energetic around her male friends, but somewhat dull around her girlfriends, complaining about how slim they look and how fat she is (although she is not). She hardly eats and gets drunk without hardly a sip of alcohol. She is overly dramatic during the night, when she complains about how hard and lonely her life is. She likes to take long walks and talk about the books she reads and the movies she sees. She loves Chinese art, literature and politics. Despite her intelligence, she will repeat how dumb she is. The GTB appears angelically innocent, harmless and pure, while she is anything but that: she is ambitious and would sell her soul for money [21]”. Weibo commenters mention the Chinese Lin Huiyin as the archetype of the ‘*green tea b\*tch*’. Lin Huiyin, or Phyllis Lin (1904-1955), was a famous architect, poet and writer. She was married to Liang Sicheng, who is also known as the ‘Father of modern Chinese architecture’. Lin supposedly also conquered the hearts of writer Xu Zhimo and philosopher Jin Yuelin. She is generally described as an ambitious, successful and plain woman who managed to win the love of rich and talented men, which is why Chinese netizens take her as the typical example of a green tea bitch. Lin\_Huiyin *The green tea b\*tch* is one amongst many terms categorizing different ‘types’ of Chinese women. The ‘*coffee b\*tch*’ (咖啡婊) is often mentioned on Weibo and other social media platforms to describe high-end office ladies who constantly mix English with Chinese, dress according to the latest fashion craze and love to take pictures of themselves in fancy restaurants or on sunny beaches. The ‘*black tea b\*tch*’ (红茶婊) is a promiscuous girl who smokes, drinks, and likes eyeliner and low-cut clothes that show her cleavage. The ‘*milk tea b\*tch*’ (奶茶婊) is the kind of woman who talks in a girlish voice and has extremely sweet looks. She is always kind to everyone around her, but only to attract men who will give her presents that she will kindly accept. “Not your *tea*, not your *b\*tch*!” [21]. Public debates that attempt to define Chinese feminine roles have emerged since the 1990s. The decades before this era were times of political and social constraint. Under the rule of Mao, women were expected to be asexual and sacrifice themselves for the collective. The 1990s brought sexual liberation and a renewed awareness of what Chinese femininity entailed. China’s social environment was changing and increasingly influenced by the West. Female sexuality now also started to be used for commercial purposes, and new types of female identities were formed (Hung et al 2005; Evans 1995). The discussion of female identities is nothing new, but in recent years, it seems that the online social debate has taken a derogatory tone towards women. *The green tea b\*tch* phenomenon is just one of many examples. As reported by Women’s Voice, there are small signs of resistance, as women refuse to be categorized in these terms. Their message: “Not your *tea*, not your *b\*tch*!” It will take more protests like theirs to get the message across. For now, it is only a matter of time before the next something-bitch pops up” [21].

So, nowadays “*green tea b\*tch*” has become among other popular types of negative characters:

The novel “Seeking Good Temptation”: When Bai Xun was bored, she played a dating game recommended by a friend.

She entered the game and must keep up the affection with seven different types of men as the only way to clear the game. Only when she gets seven hearts safely can she go home?

After many deaths, Bai Xun knew it, and could only live by paying closer attention!!

This game is also known as “Jianzhen Handbook”, “My Seven Boyfriends”, “I was Careless in a Shura Field”! *Green tea bit\*h* is in a fragrant garden, and the white lotus is a *b\*tch*! [22]

The novel “*The Green Tea’s Crushing Victories in the ’70s*”: Tong Xuelu had the nickname Queen of *Green Tea*.

She was stunning in look, has a shapely body, and had a lot of suitors though she had never been in any serious relationships.

By the time she was done being *a green tea* and was about to be a nice person, her retribution had caught up to her!

She had transmigrated into a book. In the 70s where materialistic goods were rare and she was a poor soul who was the fake daughter of a wealthy family!

Per the story, she would be face slapped by the real daughter who was rebirthed, be married to an old man who had once been married, and finally die from domestic violence.

Tong XueLu: .....I'd rather continue to be *a green tea* [23].

The novel "Villainess Wants To Turn Over A New Leaf": Lin Feilu, or better known by her nickname - *Green Tea* Princess, was the best of all the scheming b\*tches that the world had ever seen. She was the Oscar-winning actress among the masses with real life as her stage. Acting coy, slandering, feigning innocence, or playing the saint, she aced it all. Simply put, she was the proverbial villainess.

Ah, but retribution came way too early for this malicious personage and she died on her 27th birthday.

In death, Lin Feilu reflected on her career of 20 years as the *Green Tea* Princess. She was full of regret and remorse over the life she once led. She vowed, if there was an afterlife, she would atone for her misdeeds and be a good person.

She transmigrated into a five-year-old princess of the Dalin Dynasty. In the name of family, she had a sickly mother disfavoured by the emperor, a mentally challenged and daft older brother [24].

The novel "*Green Tea* Cultivation Manual ": Xue Qiao went on the road to becoming a *green tea* because she met a bitch in the game.

But later, she went on this road and never returned... Xue Qiao grabbed Huo Xiaoxiong's sleeve to act like a baby, "Although I am not skilled and not good, you still have to take me till I get in the king rank."

Huo Xiaoxiong: " Good."

Xue Qiao stood on tiptoe and put her arms around his neck, "My teammate scolded me, you have to scold them back as soon as possible." [25]

The novel "Please Have a Cup of *Green Tea*": As a senior *Green Tea*, Bi Ming recently became addicted to watching love variety shows and she found a very interesting phenomenon:

As long as the girls are more popular and people can't find any real black spots, they like to call them "*Green Tea*".

As long as you don't like a girl, using "*Tea*" to describe the other party seems to be able to win back a city and humiliate her maliciously.

No matter what the character of the girl is; innocent, lively, gentle, kind, or bright and generous, as long as they use the word "*Tea*" to label the other party, they can scold her to their heart's content.

"She is also *green tea*?" Bi Ming watched the sour netizens in the comment area jumping up and down to scold the most beautiful and well behaved girl in the show as '*Green tea girl*,' and she couldn't help sneering, "I still have too little knowledge."

Real *green tea* can make you cry without crying. As a *green tea* herself, Bi Ming was well versed in the '*tea art*'. Even if she changed men like she changes clothes, whenever she hooked her finger, someone will lick it. Moreover, she could also render the lemon essences who were jealous of her speechless [26].

So you can see that green color is used not only in an applied sense, but also in a figurative sense – in phraseological unit "*green tea*" referring to the characteristics of a person, typically in Asian novels. And it becomes widespread in European countries.

## CONCLUSIONS.

In conclusion, I'd like to say that during our research, we came to the following conclusions: each person perceives the world around him or her in the form of color. The color accompanies almost all our life. Each linguistic culture has its own ethno-priority and ethno-relevant colours, that is why color acts as an

exponent of universality, diversity and uniqueness in the perception of the outside world. Thus, colour plays an important role in a person's perception of the world around him or her, which helps to evoke certain associations.

Colour associativity can be clearly traced in the language in the form of various kinds of stable combinations containing colour component (since they are frozen, have a constant lexical composition and general value).

The naming of the color *green* in the substandard lexicon past semantic, descriptive and phrase-illustrative derivation. The analysis carried out indicates significant coincidences in conceptualization of the studied colour designations, which are caught by some universal features of the perception of phenomena such as reality, similar climatic conditions, separate coincidences of living conditions, language contact and interaction of cultures.

Differences in the semantic structure of color terms in English and Asian languages are due to national and cultural characteristics, the symbolism of colour in specific language; similarities, in turn, also depend on the presence of common features in the symbolism, perception of color by native speakers of both languages.

This research is an attempt to analyze the phenomenon of *green* colour in the expression *green tea* as a kind of concept of worldview, giving a wide nominative potential, versatility and semantic polysemy. As a prospect for further research, we can consider the study of the concepts of other colours in texts of various genres in different languages, which will allow more deeply explore the national and cultural specifics.

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## **BIOLOGIZATION OF AGRICULTURE AS AN ELEMENT OF INCREASING ECONOMIC EFFICIENCY OF CROP PRODUCTION IN THE TERRITORY OF SOUTHERN UKRAINE**

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### **ABSTRACT**

*Extensive system of agriculture applying mineral fertilizers and pesticides has caused ecological imbalance in agro-ecosystems, soil degradation, negative consequences in the biosphere and problems of food safety. The research establishes that application of biological preparations and plant growth regulators in crop production is a promising trend in agriculture ensuring high potential of agricultural production with a minimal impact on agro-ecosystems. The purpose of the study is to determine effectiveness of application of bio-preparations and plant growth regulators for growing agricultural crops in the Southern Steppe zone of Ukraine. The research was conducted using field, analytical, economic-statistical, comparative and abstract-logical methods. The study on productivity of agricultural crops under arid conditions of the Southern Steppe of Ukraine was based on application of the plant growth regulators Hreinaktyv C and Nano-Hro. The highest increase in winter wheat grain yield was identified in the crops treated three times with Hreinaktyv C at the stage of tillering, flag leaf emergence and grain filling (3.2 c/ha, 18 %). In this case the greatest effect was observed in the crops treated at the stage of tillering, where an increase in the yield was 2.9 c/ha, +16 % to the control variant. Treatment of the crops at the stage of a flag leaf contributed to an increase in the yield by 0.7 c/ha (4 %), and at the stage of grain filling – by 0.8 c/ha (4.5 %). Pre-sowing treatment of sunflower hybrid seeds with Nano-Hro and treatment of the crops at the growing stage (before a flowering stage) resulted in an equal increase – by 0.9 c/ha of seeds (+12 % to the control variant). An increase in the yield was only 0.32 c/ha (4 %) when sunflower crops were treated after flowering. The highest increase in the sunflower yield was observed when the crops were treated three times at the mentioned development stages being 1.6 c/ha (+22 % to the control variant). A positive effect of the preparation was identified at the initial stages of the industrial crop development due to the growth of the root system and an increase in absorption of nutrients from the soil. The research establishes that the preparation Hreinaktyv C is environmentally friendly, it decomposes quickly in soil, does not cause an effect of adaptation and reduces a risk of plant diseases, has a positive impact on agricultural crop productivity. Pre-sowing treatment with the plant growth stimulator Nano-Hro contributes to immune effect of plants, increases their resistance to unfavorable weather conditions, decreases pesticide loads on soils and protects against pests. Application of bio-preparations contributes to a rise in economic efficiency and improvement of agricultural production, allows reducing norms of the pesticides used, increasing productivity and quality of grain and industrial crops. It was established that total costs for seed treatment or herbage treatment with Hreinaktyv-C and Nano-Hro equaled 30–65 UAH/ha, the level of profitability amounted to 10 thous. UAH/ha. Implementation of biological technology elements increases profits of agricultural production to 80% that is a precondition for sustainable development of agro-industrial complex and a further rise in productivity of Ukraine's economy.*

**Keywords:** *economic efficiency, profitability, biological technologies, agricultural production, soil quality.*

### **INTRODUCTION**

Intensive development of the global civilization has caused irreversible degradation processes in natural ecosystems. A reduction in the quality of soils, water resources and atmospheric air has affected productivity of plant cover which plays a key role in fixation and transmission of energy to living beings, products of organic matter and oxygen. The existing technologies in agricultural production based on extensive system of soil tillage, application of mineral fertilizers and pesticides disrupt balance in all components of the environment. A further tendency for intensive use of land resources with application of chemical preparations will cause negative global consequences in the biosphere, problems of food safety for humans and emergencies threatening the existence of life on Earth. A promising trend in agriculture ensuring high poten-

tial of agricultural production with a minimal impact on agro-ecosystems is application of biological preparations and growth regulators in crop production.

### **ANALYSIS OF THE RECENT RESEARCH AND PUBLICATIONS**

A wide application of biological methods for plant protection in agricultural production occurred in the 60's of the 20<sup>th</sup> century. Advancement of scientific research was based on the development of new technological decisions concerning an increase in efficiency of bio-preparations, plant growth regulators and complex application of them in agriculture [1]. The issue of introduction of alternative biological agriculture, specificity of application of biological and growth-regulating preparations aimed at achieving environmental safety was considered in the scientific studies by O. L. Dubytskyi [2], S. A. Yashchenko. [3], M. Kozhushko [4], H. M. Sedilo [5], O. A. Kovalenko [6], I. V. Honcharuk [7], Ye. O. Domaratskyi [8], T. P. Shepilova [9], H. A. Chuhrii [10], T. O. Hrabovska [11], M. H. Vasylenko [12], A. T. Farniev [13] and others.

The global scientific community faces the problem of searching for innovative methods for increasing the global food supply because of a rise in the number of people living on Earth. The studies of the foreign scientists [14-18] confirmed the effect of bio-preparations and plant growth regulators on productivity and improvement of agricultural product quality. In their studies, Jubi Jacob [19]; Shagufta Afreena [20]; Archana Singh [21]., presented nanotechnologies for increasing productivity of agricultural crops on the basis of plant growth regulators containing carbon and cuprum, protecting plants against pathogenic organisms and negative factors of the environment. Reda Ben Mrid suggested applying bio-stimulators and bio-protectors on the basis of extracts of sea weeds, humin substances, protein hydrolysates, aminoacids, plant extracts for improving plant growth and productivity, reducing a negative impact of abiotic and biotic factors of the environment [22].

Main purpose of the chapter is to substantiate appropriateness of applying bio-preparations and growth regulators for increasing economic efficiency of crop production in the Steppe zone of Ukraine.

### **METHODS OF RESEARCH**

The research was carried out by means of field, analytical, economic-statistical, comparative and abstract-logical methods.

The territory of the research is located in the Steppe zone of Ukraine characterized by unfavorable natural climatic conditions for agricultural production which manifest themselves as intensive ineffective rainfalls and periods without rainfalls under conditions of high summer temperatures. The soils are mainly chestnut, alkali and soloth. The thickness of humus horizon is 45–55 cm. The density of composition is 1.25–1.35, the density of a solid phase of soil is 2.65–2.69 g/cm<sup>3</sup>. The total porosity is 45–50 %. The humidity of withering is 6–8 %, LMC – 21-30 %. pH of the environment is 7.2–7.4. Waterproof aggregates of more than 0.25 mm make 40–42 % [8].

The effect of the stimulator Hreinaktyv-C on productivity of the winter wheat Driada-1 was determined using the following experiment scheme:

1. Without plant treatment (control).
2. Plant treatment at the stage of tillering.
3. Plant treatment at the stage of the flag leaf.
4. Plant treatment at the stage of grain filling.
5. Three-time plant treatment.

The experiment was replicated four times. The area of the registered plot was 100 m<sup>2</sup>.

The effect of the stimulator Nano-Hro on productivity of the sunflower hybrid Siuzhet was determined using the following experiment scheme:

1. Control (without treatment).
2. Seed treatment before sowing.
3. Treatment at the stage of growth.

4. Treatment after flowering.
5. Three-time plant treatment.

The experiment was replicated four times. The area of the registered plot was 100 m<sup>2</sup>.

## RESULTS AND DISCUSSIONS

The territory of Kherson region is dangerous in terms of erosion with strong winds – more than 6 m/s, dry, with a high average annual air temperature and an insufficient amount of precipitation. Groundwater is located 3–4 m deep. Disruption of the hydrodynamic regime of groundwater caused a decline in the water table, an increase in the number of dry days and a reduction in air humidity, that led to a drop in productive moisture in the soil and a fall in the crop productivity of 20–70 % [23].

The agro-meteorological conditions of the research territory are unfavorable for obtaining high yields of agricultural crops, therefore, it is necessary to apply biological preparations in order to increase productivity of agricultural products under dry conditions and ensure ecologically balanced agricultural production.

The mechanism of the effect of bio-preparations consists in fermentative fixation of atmospheric nitrogen and fermentative assimilation of poorly soluble phosphates ensuring intensive development of a plant root system that has a positive impact on the ability of winter crops to survive winter. It should be mentioned that treated agricultural crops are more resistant to diseases due to improvement of their general immunity, there is a significant increase in energy of seed germination, there are favorable conditions for the formation of plant stand and generative organs, intensity of ontogenesis and photosynthesis improves.

Seed treatment with biological preparations facilitates activation of nitrogen-assimilation ferments in plants that causes additional protein synthesis in grains. Examination of the effect of the preparation Hreinaktyv-C on winter wheat crops showed its positive impacts on the crop productivity. Hreinaktyv-C is an innovative preparation with a systemic positive impact on agricultural crops. The active ingredient is a soluble biologically active organic compound containing nitrogen atoms boosting exchange processes in plants, facilitating processes of nitrification and ammonification in soil and plant growth under conditions of moisture deficit. Formation of plant-bacteria association contributes to substantial accumulation of nitrogen in soil, that improves indexes of its fertility and increases winter wheat productivity. It was established that the effects of the preparation Hreinaktyv-C depended on the stages of plant development in which the crops were treated with the growth stimulator (Table 1). According to the data in Table 1, the most considerable increase in winter wheat grain productivity was observed under 3-time treatment of the crops at the stages of tillering, the flag leaf and grain filling (3.2 c/ha, or 18 %).

**Table 1. The effect of the growth stimulator Hreinaktyv-C on winter wheat productivity**

№	Variants	Productivity, c/ha				Average	+	-	Ranking
		Replication							
		I	II	III	IV				
1	Without treatment (control)	18.2	16.8	19.4	17.6	18.0	0	5	
2	Treatment at the stage of tillering	20.1	21.2	21.6	20.9	20.9	+2.9	2	
3	Treatment at the stage of the flag leaf	19.1	18.6	19.2	17.9	18.7	+0.7	4	
4	Treatment at the stage of grain filling	18.0	19.6	18.5	19.0	18.8	+0.8	3	
5	3-time treatment	21.3	20.6	22.1	20.5	21.2	3.2	1	

LSD<sub>0.05</sub> – 0.92 c/ha

The most significant effect was observed under the crop treatment at the stage of tillering, when an increase in the yield equaled 2.9 c/ha, or +16 % in comparison with the control variant. The crop treatment at the stage of the flag leaf contributed to an increase in the yield – 0.7 c/ha (4 %), and at the stage of grain filling – 0.8 c/ha (4.5 %), which were within the limits of the experiment error being 0.92 c/ha.

The preparation Hreinaktyv-C is environmentally friendly, because it decomposes in soil, does not cause the effect of habituation and reduces the risk of damage by plant diseases and has a positive effect on crop productivity.

A positive impact of the preparation Nano-Hro on sunflower hybrid productivity was also established (Table 2).

**Table 2. The effect of the growth stimulator Nano-Hro on sunflower hybrid productivity**

№	Variants	Productivity, c/ha					+	Rankin g
		Replication				Average		
		I	II	III	IV			
1	Control (without treatment)	7.0	6.8	7.9	7.7	7.3	0	5
2	Seed treatment	8.3	7.8	8.9	7.5	8.2	0.9	3
3	Treatment at the stage of growth	8.1	8.6	7.8	8.0	8.2	0.9	2
4	Treatment after flowering	7.6	8.0	7.2	7.4	7.6	0.3	4
5	3-time treatment	8.7	9.2	8.5	6.4	8.9	1.6	1

LSD<sub>0.05</sub> – 0.54 c/ha

According to the data in Table 2, the effectiveness of the preparation also depends on the time of application.

The identical increase – 0.9 c/ha of seeds (+12 % in comparison with the control variant) – was observed under pre-sowing seed treatment at the stage of growth (before flowering), and an increase in the yield under sunflower treatment after flowering was only 0.32 c/ha (4 %). The most considerable increase in the yield was observed under 3-time treatment at the above stages of sunflower development – 1.6 c/ha (+22 % in comparison with the control variant). A positive effect of the bio-preparation was observed at the initial development stages of the industrial crop due to the growth of a root system and more intensive absorption of nutrients from the soil.

Pre-sowing treatment with the growth stimulator Nano-Hro contributes to a rise in immune activity of plants, increases their resistance to unfavorable weather conditions, protects against pests and results in a reduction in pesticide loads in soils.

Application of bio-preparations of a complex effect in agricultural production is especially important for the zone of Southern Ukraine which is characterized by unfavorable climatic conditions. Since productivity of agricultural crops depends on abiotic and biotic conditions of the environment, plant treatment with growth regulators facilitates improvement of immune and productive potential of plants and increases resistance of agricultural crops to unfavorable ecological factors of the environment. Apart from a positive effect on physiological processes of plants, growth stimulators have a positive impact on micro-biological processes in soil, in particular, on assimilation of carbon dioxide by heterotrophic microorganisms. Accumulation of organic matter occurs and soil formation process in agrocenoses improves.

Due to their growth-regulating, anti-stress and protective functions, the preparations Hreinaktyv-C and Nano-Hro allow obtaining environmentally friendly agricultural products and contribute to ensuring food security of Southern Ukraine. Application of poly-functional growth-regulating preparations is an effective technology for treatment of grain and industrial crops.



Application of biological methods for plant protection contributes to an increase in economic efficiency of agricultural production and a rise in productivity under extreme weather factors. The values of economic indexes for each agricultural crop of field crop rotation depends on agro-technical production and duration of a direct effect of the applied bio-active substances.

An increase in the volume of agricultural products under treatment of agricultural crops with bio-preparations ensures an increase in profitability up to 800 conventional units per hectare. Therefore, it is recommended that agricultural enterprises improve technologies for agricultural production on the basis of application of biological and integrated plant protection products, reduce use of chemical methods with a dangerous prolonged effect on the environment and human health in order to increase the level of profitability.

Application of the bio-preparations Hreinaktyv-C and Nano-Hro allows reducing the norms of pesticides, increasing productivity and quality of grain and industrial crops. It was established that the total costs for seed treatment and herbage treatment equal 30–65 UAH/ha, the level of profitability is about 10 thous. UAH/ha.

Under current conditions of agricultural production, the system of biological agriculture is considered as a scientifically substantiated complex of agro-technical, organizational and economic measures, ensuring efficient use of land resources, contributing to a reduction in anthropogenic loads on agrocenoses, humus regeneration, an increase in productivity of agricultural crops, plant resistance to diseases and pests, competitiveness of agricultural products on the domestic and global markets.

In Ukraine, the most widespread biological methods for plant protection used in the system of agriculture are bio-preparations of bacterial, fungal and entomological origin. Their main functions consist in increasing productivity of agricultural crops, fixing atmospheric nitrogen, mobilizing poorly available phosphorous and stimulating plant growth. In spite of considerable advantages in application of bio-preparations, their introduction into agricultural production occurs at a slow pace and has an unstable tendency for further use. The share of biological methods for plant protection over the past 20 years has reduced by 11% and application of chemicals has increased three times (Fig. 1).

In 2020 the share biological methods for plant protection equaled 8.3 %, that is 8 % more in comparison with 2018. Bio-preparations are mostly applied in Cherkasy, Khmelnytskyi, Chernihiv, Chernivtsi, Poltava, Kyiv, Sumy, Rivne and Volyn regions [1].

According to the data of the Food and Agriculture Organization of the UNO (FAO), there is a reduction in productivity of agricultural crops by 40 % as a consequence of the impact of pests. Application of chemicals to soil causes an excessive increase in the amount of pollutants in agrocenoses, a reduction in pest resistance to plant protection products, delivery of them through food chains and accumulation in food products.

Because of the global tendencies aimed at ensuring stable and secure economy, a reduction in application of chemical for plant protection, the following is forecasted: a rise in the share of alternative methods of biological orientation in the European agrarian sector to 10 %, an increase in the area of agricultural lands for organic agriculture, a reduction in application of pesticides by 50 %. Since there is an intensive anthropogenic pressure on land resources, the priority problems are safe food for humans and ecological safety of the environment, which can be solved due to transition to alternative biological methods of agriculture.

The process of biologization is aimed at reducing anthropogenic loads on agro-ecosystems, obtaining a high level of productivity of agricultural crops and profitability of agricultural production of about 115–135 %. The scientific studies [24, 25] prove a positive effect of biological methods for plant protection on biometric and qualitative indexes of sunflower and grain crops.

The scientific data obtained by P. V. Pysarenko [26] allowed determining that unstable symbiosis between plants and microorganisms at the initial stages of their development leads to an increase in the effectiveness of biological preparations provided that minimum doses of mineral fertilizers are applied to soil. M. Novohatskyi emphasizes integrated application of traditional agricultural technologies and biological

methods for plant protection with further development of adaptive techniques under global climate change [27].

The scientific studies confirm an increase in productivity and quality of winter wheat due to the growth stimulator Melafen. There is a rise in fiber content by 3 %, protein and nitrogen contents – to 11%, and there is a reduction in the content of pollutants in plants by 8 % [28].

In order to create favorable conditions for plant growth in agrocenoses, it is highly important to provide them with micro- and macro-elements. Samriti Mankotia et al., 2022 examined the mechanism of assimilation of nutrients by plants by means of application of bio-technological methods resulting in improvement of mineral nutrition of plants and qualitative characteristics of agricultural crops [29].

Thorough scientific research on application of innovative bio-preparations in crop production contributes to regeneration of ecological conditions of agro-ecosystems, production of high-quality environmentally friendly food products, ensures food safety on the globe and a rise in the level of profitability of agricultural production. Application of biologized elements of technology increases profits of agricultural production to 80%, that is a precondition for sustainable development of the agro-industrial complex and a further increase in the efficiency of Ukraine's economy.

## CONCLUSIONS

The research allowed identifying a positive effect of the growth-regulating preparation Hreinaktyv-C on winter wheat productivity. The most significant increase in yields was observed under crop treatment at the stage of tillering, the level of productivity being 2.9 c/ha (+16 % in comparison with the control variant). When sunflower plants were treated with the preparation Nano-Hro, the highest level of productivity was observed under 3-time treatment at all the stages of sunflower development – 1.6 c/ha (+22 % in comparison with the control). A positive effect of the growth-regulating preparation Nano-Hro was observed at the initial development stages of the industrial crop due to growth of a root system and more intensive absorption of nutrients from soil.

Application of micro-biological and growth-regulating preparations of biological origin in crop production is a promising trend for further research on their complex effect on productivity of agricultural crops and ecological conditions of agro-ecosystems.

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## THE CONCEPT OF MARKETING MANAGEMENT AS A BUSINESS PHILOSOPHY ON THE BASIS OF HR MARKETING

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### **ABSTRACT**

*The chapter substantiates the role and importance of marketing management in the conditions of innovative development of equipment and technologies, increased competition. The content of the modern concept of socially responsible consumer-oriented marketing is revealed. Modern functions of marketing management at the enterprise are defined. The importance of internal marketing management in the concept of social and ethical marketing is argued. The areas of HR-marketing activity in the field of personnel attraction have been determined in order to achieve the goal of marketing management. Modern innovative methods of personnel training and development are characterized. The content of corporate culture and philosophy with their details is defined as the conceptual basis of marketing management. The need to create a marketing service at the enterprise to implement the goals and tasks of marketing management is substantiated.*

**Keywords:** *marketing, management, marketing management, HR-marketing, marketing management, consumer, personnel, socially oriented marketing.*

### **INTRODUCTION**

In today's conditions of rapid development of science, technology and technology, increased market competition and market orientation of enterprises, success can only be achieved by an enterprise that is constantly looking for new ways to adapt to the constantly changing market conditions of its operation and development. This requires creative approaches to the application of the latest effective management methods. Marketing is one of the most dynamic spheres of economic activity.

In conditions of competition, marketing management is a determining factor in the development of the enterprise. Today, one of the most important tools for influencing the performance of an enterprise is the management of marketing activities. Management is present in all spheres of society. Enterprises are interested in effective management of marketing activities and finding a qualitatively new approach to the organization of production and sales of goods. Marketing management forms the skills of planning, organizing, motivating and controlling the marketing activities of the enterprise.

This will provide an opportunity to strengthen economic activity, increase entrepreneurial spirit, and expand business. Today, there is a need to use an innovative approach in production and sales management based on the principles of marketing and management.

In this connection, the study of marketing management methods and technologies, which are used in their business models by the world's leading companies, becomes especially relevant. The research of the problems of marketing management in general and the use of its methods in modern business models of retail in particular are devoted to the works of famous foreign and domestic scientists. It is believed that the introduction into scientific circulation of the concept of "marketing management" ("marketing management"), as well as its further spread in the theory and practice of management, is closely related to H. Armstrong, P. Drucker, F. Kotler, K. Keller and others.

Modern Ukrainian scientists continue researching various aspects of marketing management: L. Bala-banova, O. Bilovodska, V. Vorobyov, I. Komarnytskyi, I. Koshova, V. Kutsenko, V. Rossokha, N. Yazvinska. However, despite the large number of studies in the field of marketing management at the enterprise, this issue remains relevant and necessitates additional in-depth research.

The purpose of the research is the theoretical substantiation of the conceptual provisions of marketing management at the enterprise and the determination of directions for the implementation of its internal direction - HR-marketing.

## METHODS

As a business philosophy, marketing orients management to activities aimed primarily at satisfying the needs of consumers, since they are the ones that ensure the company's profit. The choice of the most effective means of marketing management of the enterprise depends on the ability of managers to take into account the trends characteristic of the development of the modern market in a timely manner. The main ones are increasing the value of quality, price and customer satisfaction, the need to build sustainable relationships with them; the ability to think globally; strengthening the role of high-tech industries in business; increasing the importance of marketing services.

Marketing as a concept of company management (hence "marketing management") forms the basis of its intra-company management aimed at achieving high efficiency of economic activity in the conditions of the modern market.

The modern system of views on management involves rational organization of production, cost reduction, development of specialization, i.e. influence on internal factors of production. The problem of flexibility and adaptability to constant changes in the external environment, the use of a situational approach to management, recognition of the social responsibility of management both to society in general and to the employees of the organization comes first.

According to O.I. Kovshova, marketing management is an innovative approach to enterprise management that allows achieving optimal economic performance and a positive social effect at the same time, reconciling the various interests of owners, managers, employees, partners, consumers and society. In contrast to the socio-ethical approach to management, where the enterprise declares certain corporate values and further adheres to them in its current activities, marketing management proceeds from the needs of customers and adapts in accordance with the modification of their desires and requirements for goods, services or ideas offered on the market [ 1, p. 5].

The modern concept of socially responsible marketing is related to studying the needs and interests of target markets, ensuring their desired satisfaction more efficiently and productively than competitors, in ways that simultaneously preserve or strengthen the well-being of the consumer and society in general. Within the framework of such a concept, marketers-managers are forced to establish a balance of conflicting indicators that determine the company's income, satisfaction of consumer needs, and public interests.

Socio-ethical orientation to consumers keeps marketing management within the limits of the main purpose and offers exactly what the consumer needs. Businesses need to produce such products that solve certain problems of customers, and not to create them themselves. There is no need to get attached to technologies, since the basic needs are almost unchanged, and the options for their implementation quickly become obsolete. Refusal to apply this principle in practice leads to cluttering of warehouses with the remains of unusable products, significant financial losses of the enterprise, pollution of the environment with unnecessary garbage.

The competence of the marketing management organization is the basis of the quality implementation and functioning of marketing management at the enterprise by qualified personnel who have the necessary knowledge and experience. General competence is determined by the effectiveness of management decisions of a top-level manager in accordance with the set strategic goals. Such efficiency is achieved by: qualification, knowledge and hard work of every employee at his workplace; the manager's ability to distribute and delegate authority and responsibility for certain economic processes; the art of effectively performing work under normal or extreme conditions, etc. Also, this principle ensures that all employees of the enterprise are aware of the main eight principles of marketing management organization.

Thus, in the Glossary of the European Education Foundation, it is stated that competence is the ability to adequately apply learning outcomes for professional activity, personal and professional development [2]. That is, it is a set of integral qualities that allow the enterprise to work efficiently and effectively on the market regardless of the changing environment. Accordingly, the competence approach defines marketing management as a set of integral qualities, the principles of defining goals and setting tasks, selecting their content, organizing the management process and evaluating performance.

Given this approach, the role of HR marketing in the marketing management system is growing. HR-marketing is designed to provide the company with quality personnel. The purpose of internal HR marketing is training and development of personnel. In HR-marketing, motivation is considered as an activity aimed at energizing people working in the organization, encouraging them to work effectively to achieve the goals defined by the company's plans. So, in the process of their activity, marketing managers not only make plans, but also organize their implementation, forming structures, processes and methods that contribute to joint and effective work. That is why marketing managers are called people who achieve their goals using the work, intelligence and motives of other people's behavior. There are many definitions of marketing management in the scientific literature. Thus, according to F. Kotler, marketing management is a process of planning and implementation of concepts regarding pricing, promotion and distribution of ideas, goods and services, aimed at carrying out exchanges that satisfy individual and organizational goals [3].

So, marketing management is a process, the main components of which are analysis, planning, implementation of plans and control over the implementation of measures aimed at establishing, strengthening and maintaining mutually beneficial exchanges with target markets to achieve the company's goals under the condition of active use of HR resources.

According to this definition and general concepts of management functions, the main functions of marketing management include (Table 1):

**Table 1. The main functions of marketing management**

<i>Function of marketing management</i>	<i>Function content</i>
Definition of goals	Organization of collection and processing of marketing information; development of the concept, goals and tasks of the enterprise, the main strategic principles of its activity, coordination with the goals of marketing management.
Market analysis	Determination of its potential, capacity, situation, demand, consumer behavior, evaluation of competitors) and, accordingly, the market opportunities of the enterprise, taking into account its resources.
Planning	Development of enterprise strategy, determination of product sales markets, potential consumers, formation of production and sales marketing programs based on market and economic forecasts, procurement of material and technical resources, production, price policy, distribution channels, a complex of marketing communications, evaluations of the development of scientific and technical progress and changes in the quality of products, requirements for the level of qualification of the furrier.
Organization	Formation of the organizational structure of marketing at the enterprise; implementation of established plans (development of specific tasks, determination of powers and responsibilities for the implementation of marketing activities). Providing the enterprise with everything necessary for the performance of work - personnel, materials, equipment, buildings, finances.

Motivation	Development and implementation of material and moral incentives for employees in order to increase the efficiency of their work and to achieve the goals defined by the company's plans.
Control and analysis of the implementation of marketing plans (measures)	A system of activities aimed at performing marketing functions. Quantitative and qualitative assessment and consideration of work results enterprises by means of observation, verification of all aspects of the company's activities, accounting and analysis.
Decision-making	Formation and implementation of product and price policy, ways and directions of product promotion, HR-marketing policy. Involvement of company employees in the decision-making process, use of leadership as a method of effective group influence on joint activities.

Marketing management as one of many functional tasks of the enterprise must be carried out in accordance with the approved marketing plan, which, at the same time, is part of the general business plan of the business entity. Of course, marketing management is implemented within certain limits external and internal environment, which affects the development of its concept, formation goals, limits and methods of implementation [4].

Marketing management can function only on the condition that the management of the enterprise is carried out on the basis of marketing principles, that is, the consumer should be at the center of the organization, and the marketing and management system should combine all efforts to satisfy the needs of consumers as much as possible [5]. Marketing managers and product managers perform marketing management processes. Customers can see the results of this process in the form of products, prices, advertisements, promotions, etc. Marketing managers must balance the value of the benefits and solutions to problems offered to customers against the profitability of certain customer groups.

Organizations have their own unique culture that can help or hinder the marketing function. Marketing management is a mechanism that eliminates the imbalance between the needs of consumers and the capabilities of the enterprise. The task of the enterprise is to motivate employees to do high-quality and productive work, the duty of the staff is to faithfully fulfill the assigned tasks.

The function of motivation is closely related to other functions of production management - planning, organization, control. When planning work, the manager is obliged to direct the efforts of the organization's employees in the direction that will lead the organization to accomplish the task. The goal set for employees should be clear, realistic and achievable. The motivation of the company's employees makes it possible to eliminate the lack of initiative of the staff and low performance indicators.

The modern concept of marketing management is implemented on the theory of individual selection, which is based on the principle of consumer priority based on the development of a complex mechanism of his involvement. The organization produces products or provides services, thanks to which it is possible to solve the problems of consumers or society in general. At the same time, the loyalty of partners increases the basic value of the company's manufactured goods, and therefore the level of competitiveness also increases. An increase in the company's income level makes it possible to pay employees a decent salary and various bonuses. Stimulated and encouraged employees implement innovations, as a result of which the company's effective operations are ensured. Since the priority approach to the implementation of the principles of marketing management is to focus consumers on the company's activities by individualizing relations, the final result of marketing management is the complete satisfaction of consumer needs.

Interactive marketing management involves achieving a certain goal with the help of information exchange between departments, employees, partners and customers, which increases the effectiveness of relationships. This type of marketing management actively uses various information and communication



systems, actively and adequately responds to participants' signals and offers options for management solutions. Thus, interactive marketing management functions in a system with three elements (people, machines and interactivity) to improve the performance of the enterprise [1, p. 35].

According to the criterion of the level of use, internal, external and integrated marketing management are distinguished. Internal marketing management is implemented within the enterprise and is mandatory for all departments and employees. The external manifests itself only during activities with counterparties for the formation of partnership relations and the creation of a loyal attitude towards the enterprise. Complex marketing management covers all processes of the business entity and is implemented both internally and externally.

## RESULTS

Our research is aimed at the effectiveness of the application of internal marketing management. HR-marketing today plays a leading role in the enterprise management system. It is an integral element in the strategic management system of the enterprise. Therefore, specialists in this field must be highly qualified and knowledgeable not only in the field of personnel management, but also understand the general requirements for the successful functioning of the enterprise as a whole. In turn, constant monitoring of HR-marketing indicators will allow to improve personnel management processes at the enterprise and prevent the occurrence of critical situations related to inefficient use of personnel.

HR marketing can be defined as the activities undertaken by an organization to attract and retain top talent, such as marketing employment opportunities, marketing training programs for internal employees, etc. HR marketing applies marketing concepts to HR, thus facilitating the recruitment and retention of resources for the organization [6].

HR marketing is a type of management activity aimed at long-term provision of the organization with human resources.

These resources form a strategic potential, with the help of which it is possible to solve specific target problems. Knowledge of the basics of personnel marketing by specialists and company managers is an important condition for the effectiveness of the organization's functioning. HR goals:

- support the company in achieving its goals through the implementation of the HR strategy (which is built on the basis of the business strategy);
- participate in creating a culture of high efficiency;
- to create positive relations between employees and managers;
- to build an atmosphere of mutual trust and constant feedback.

There are two global functions in HR marketing; such as:

- information, which is responsible for collecting information;
- communicative, responsible for communication of HR with candidates and existing employees.

To implement the informative function, you need to study labor market statistics, programs of higher education institutions that interest you, data from employment services and sociological research. In addition, useful information can be obtained during the interview, when the candidate talks about his needs, desires, what he found / did not find in your competitors (if he worked for them).

Analyzing statistics and received information, you can prepare a report on the market situation for management. What are the specialists, what are their needs, how much should they be paid and what results can be expected.

The communicative function involves communication with potential candidates and employees. To implement this function, the HR specialist cooperates with educational institutions, singles out the best graduates for himself, broadcasts the employer's brand not only to specific individuals, but also to the entire market. At the stage of the communication function, one cannot forget about the employees who work in the company in order to increase their loyalty, work efficiency, and reduce staff turnover. You can conduct surveys and interviews with employees to understand the situation and problems in the company.

HR marketing is related to the communication system, which is responsible for the formation of information about jobs, rewards for work offered by the employer and which are formed in the personnel management system, as well as for the transfer of this information to the appropriate target audiences.

One of the manifestations of the communication function of personnel marketing is the implementation of intra-organizational connections. Measures to support communications are: formation of a management style that would ensure the involvement of employees in the decision-making process; completeness and objectivity of personnel evaluation; regular meetings and conversations with employees, during which measures related to the management of the enterprise are discussed; an effective intra-organizational system for receiving and considering employee proposals.

HR marketing is influenced by external and internal factors. The situation on the labor market, changes in the economy and professions, labor legislation, the needs of candidates are external factors. The company's values, goals and development strategy, financial condition, personnel potential and reserve are internal. With the correct use of HR-marketing tools, you will be able to easily adapt to the factors that affect it.

First of all, HR is the management of human resources, which are the greatest value of any organization. Based on this, the main task of HR is to attract professionally trained employees to the organization, correctly assess their competences and potential, the ability to analyze and forecast the development of a specific employee, the selection of the best option for professional development, appropriate training and development, maintaining a general comfortable climate in the company.

Today, in order to select the necessary employees, marketers are involved who know how to satisfy the needs of customers, and therefore, what kind of people are needed for this. Professional recruiters have developed personal tracks of employees in various positions, points of contact with the employee and his life cycle, and known hiring indicators. There is also a well-thought-out loyalty program and other non-standard solutions for attracting employees. HR marketing is, in fact, a well-constructed recruitment strategy from the point of view of customer orientation. The HR manager divides personnel into two categories: internal (employees of the company) and external (candidates for positions in the company), and each of these categories has its own engagement strategy.

HR processes include: selection, adaptation, stimulation, training and development. These processes are designed on the basis of new approaches, such as: design thinking, behavioral economics, HR analytics, etc.). HR processes must be examined from the point of view of creating value for the employee, the possibility of redesigning and implementing processes. At the same time, the corporate culture must support these changes at all levels.

The key to the successful operation of the enterprise is the selection of professional employees. According to one of the studies, 27% of the company's sales staff will make 52% of all sales. Differences in the productivity of employees are largely determined by errors in the selection of personnel. The average turnover rate of the company's sales staff is almost 20% (for all industries). When a sales employee is fired, the costs of finding and training a new employee, along with losses from unsettled deals, are expressed in five-digit numbers. In addition, the effectiveness of the sales service, in which most employees do not have sufficient experience, decreases [3, p. 434].

After determining the selection criteria, employees are hired for vacant positions. In the search process, the HR department listens to the recommendations of the company's employees, applies to recruiting agencies and educational institutions, posts announcements about available vacancies in print media and on specialized websites. Recruitment and selection of sales personnel should be carried out on the basis of previously developed criteria. In developing such criteria, the company focuses on the qualities it wants to see in its future employees. Actually, candidate selection procedures vary from a simple interview with candidates to extensive testing and interviews. And although test results are considered one element in a number of such as individual traits, reviews, previous work experience and behavior during interviews, they are given great importance in many companies.

Personnel training programs help employees: get to know the specifics of their company's activities, form an understanding of shared goals; study the supplier's products; learn the characteristics of the company's customers and competitors; learn how to effectively conduct sales presentations; to understand the specifics of "field" sales. The training period depends on the complexity of the tasks and the personal qualities of the employee. In the process of personnel training, new innovative teaching methods are widely used: business games, audio and video equipment, information on CDs, distance learning using new computer technologies.

Under any options, training will be effective (effective) only when it is carried out according to a certain system. At the same time, special attention should be paid to the following pedagogical and psychological rules of learning:

- the prerequisites for successful learning include regularity. Without systemic actions, they are ineffective;

- readiness for learning. Therefore, another important prerequisite for successful learning is the presence of those who learn, motives for learning.

Today, there are many directions and methods of personnel development. Classic and innovative ones are usually distinguished. Traditional methods include seminars, conferences, lectures, courses. Innovative methods in Ukraine are just beginning to be widely used. They include [7; 8]:

- video training – visual training, which is carried out thanks to the provision of audio and video programs, electronic documents to the staff;

- distance learning – the use of telecommunication technologies for remote training of personnel. This training method was widely used by Ukrainian companies at the beginning of the Covid-19 pandemic. An example is pharmaceutical companies. They used e-learning based on LMS Collaborator;

- modular training – face-to-face training consisting of separate thematic blocks (modules) aimed at achieving a specific result (solving a specific business problem, developing certain competencies);

- brainstorming – a method that allows you to generate a large number of ideas for solving a problem situation in a limited period of time with further analysis and selection of the most appropriate management decision option;

- case studies – consideration of practical situations from the experience of various enterprises, which involves analysis and group discussion of hypothetical or real situations. Case training for personnel is used by the Ukrendfarming group of companies.

As Nataliya Romanenko, head of the Ukrlanfarming personnel management department, tells us, the personnel training system is built in such a way that 60% of all knowledge is formed on the basis of experience and real cases, which are solved by the employees themselves and then share experience and knowledge with other employees. 30% is self-education and self-learning, and 10% is a training system that supports, shows where there is a need to improve one's competencies [9];

- in the training education, the main attention is paid to the acquisition of practical competences, while the theoretical block is minimized. The purpose of the trainings is to simulate situations close to reality with the aim of developing certain practical skills, mastering new models of behavior, changing the attitude towards the performance of tasks;

- the method of behavioral modeling is designed to develop a certain model of behavior in standard and non-standard situations in employees. This method is based on finding an example to follow ("behavioral model"), its analysis and reproduction in practice;

- storytelling (motivational narration) – a method of training new employees of the organization to familiarize them with the organizational structure, corporate culture, and local regulatory documents;

- action-learning – a learning method for solving real problems in practice in the process of the organization's activities;

- basket method – a method of simulating situations of "managerial activity", by which an employee joins the role of a manager;

– coaching – a method of consulting, in the process of which a person (trainer), who is called a "coach", helps the employee under his supervision to achieve a professional goal, transferring his experience to him with the help of certain supervision and training. This method of personnel training is gaining popularity in the HR marketing system today. However, it was used back in 2011 by the cosmetic company Mary Kay. In the fall of this year, a staff coach was invited to conduct training for employees of this company. This project provided new experience for HR and new perspectives from the point of view of staff qualification improvement [10];

– a master class is one of the forms of effective professional, active training, during which a leading (recognized) specialist tells and shows how to apply a new technology or a new method in practice;

– Secondment (a kind of "business trip") is a type of rotation that involves the temporary transfer of an employee to another place of work, to another unit of the organization, with subsequent return to the performance of previous duties. Secondment is considered to be the most effective method, because it is believed that this approach gives strong and "aware" skills;

– Shadowing – providing an opportunity for an employee who is presented for career advancement, retraining, rotation to be a "shadow" of an employee occupying a certain position for at least two days;

– Buddying is a method that consists in assigning a partner (buddy) to an employee, whose task is to provide constant feedback on the actions and decisions of the assigned employee in order to identify "bottlenecks" in his work. Ukrainian companies use this method when adapting newcomers;

– Edutainment – the concept of staff training, which comes from "education" and "entertainment" and implies the dissemination of educational material using an entertaining approach. Video content, virtual assistant, game techniques, non-standard performances and lectures - all this can be adapted as elements of edutainment. The main goal is to educate the audience of employees while entertaining them. This technique was used by many famous companies, including Procter & Gamble and Google.

Procter&Gamble's health assessment program created a simulation in which employees were introduced to the release of a new product in a virtual manufacturing facility. A 3D model of the factory was reproduced, where the employees of the corporation trained without the risk of injury. At the end of the virtual conveyor, students were awaited by a test on attentiveness and vigilance. Google won in terms of innovation. Back in 2017, he first started using the practice of whispering training courses into employees' headphones [11].

Modern technologies of training and professional development of personnel constitute a wide space for the creativity of HR-marketing. In fact, today the head of the company can implement any idea in the field of training and professional development of personnel. It is important that the chosen method meets the learning goals and is used systematically. After all, practice proves that personnel development should not be considered as an end in itself, but as a component of the company's internal HR-marketing system.

Creating a knowledge management system that will ensure high competitiveness of enterprises and organizations and their innovative growth in the concept of innovative progress is a specific quantitative indicator of the effectiveness of social capital development. In Social philosophy is a phenomenon of the ideology of the information society, which is based on information anthropology and axiology, information ethics, culture, consciousness and digital culture. The information society lives in an age of ideas and creative leadership. The formation of digital culture, ethics, tolerance and virtual patience in the period of formation of the information society are also specific qualitative indicators of the effectiveness of the system of social capital development [12]. These social development trends must be taken into account in the marketing management system, and in particular, when developing HR-marketing measures.

For most employees, incentives and special incentives are necessary to work with full commitment. Priorities in personnel motivation are material incentives, followed by promotion, personal growth and a sense of achieved success. Location, respect, job stability and recognition are the least important. In other words, monetary rewards, opportunities for growth, and satisfaction of internal employee needs are impor-

tant in motivating staff, while recognition and stability are less important. Researchers have also established that motivation varies depending on the demographic characteristics of employees [3, p. 437].

An important role in the process of professional development of personnel is given to the development of training programs for labor skills. Personnel development programs help employees improve their professional skills, contribute to the formation of personnel with strong motivation to perform work.

In order to attract highly qualified sales staff, the company must develop an attractive remuneration system. It is necessary to determine the level and components of an effective employee compensation system. The "current market price" for workers of a certain specialty and the required qualification should be taken into account in the level of remuneration. It is necessary to determine the procedure for applying the components of labor remuneration – fixed salary, flexible payment, reimbursement of overhead costs.

Older workers, with more work experience, and even those with large families are more sensitive to financial compensation. Moral reward (recognition, position and respect, sense of achievement) is highly valued by young workers, usually single or with small families, and also with higher professional training. In addition, the results of scientific research demonstrate differences in the motivation of personnel in different countries.

Many companies set annual sales rates for sales representatives. Trade quotas include value or kind indicators of sales volumes in general and by different products, profit objectives, a list of promotional activities. The compensation system for sales staff is often aligned with the level of fulfillment of established quotas. Trade quotas are developed on the basis of the annual marketing plan. Some companies abandon or minimize quotas to ease the psychological pressure of short-term results, and instead increase the value of customer satisfaction in the long term. For example, at Siebel Systems, there are no quotas, instead criteria such as customer satisfaction, repeat business, and profitability are used. This helped Siebel gain 80% market share in its industry.

One of the modern trends in marketing is digitization and automation of HR processes. During the pandemic, technological priorities changed at many enterprises. Digitization has gradually penetrated all spheres of organizational activity, including HR processes, and has become their natural stage. Digitization of HR processes, automation of routine tasks enable HR teams to free up time to focus on more strategically important projects that have business value. In the conditions of the digital economy, it is necessary to constantly update the knowledge and skills of employees. Therefore, it is necessary to carry out measures to improve the qualifications or requalify the employees of the organization.

Effective marketing management involves the functioning of reliable feedback, that is, regular receipt of information from employees in order to assess the effectiveness of their activities. The company's management receives information about the activities of its employees from several sources: trade reports, personal observations, letters and complaints from consumers, customer surveys, conversations with other sales and marketing employees. To implement a client-oriented approach, responsible, highly organized and proactive employees who strive for self-realization and count on the evaluation of their high results are needed. Therefore, personnel marketing management is a comprehensive, planned, organized influence on the company's employees for the effective use of all the potential of the workforce. This causes the need to assess the functionality of the company's personnel using quantitative and qualitative methods.

HR-marketing is also aimed at evaluating the performance of employees. It should also be added an assessment of the degree of satisfaction of consumer needs during sales and an assessment of the qualifications of the sales staff. The latter will be important when moving employees to higher positions, which can be considered as one type of their motivation.

The optimal operation of the enterprise can be achieved thanks to the creation of a service that deals with marketing. The marketing service of the enterprise should study the indicators of the enterprise's activity and analyze the marketing process and bring up-to-date ideas and proposals for further improvement. Successfully constructed marketing management is able to bring the company to a leading position on the market and create special offers for consumers and counterparties in competitive conditions.

In the conditions of a market economy, enterprises are under the influence of a huge number of various internal and external factors, therefore, for effective functioning, the enterprise needs to occupy its special niche and recognizable image, distinguishing itself among competitors. Employees' understanding of the company's goals helps to achieve the final result faster and maximize profits through the development and improvement of optimal marketing programs. Enterprise marketers develop a program that should serve as the basis for all enterprise plans, this will make it possible to avoid work miscalculations and accurately assess one's capabilities [13].

The marketing department should have the appropriate professionals. The head of the marketing department and company managers should take care of this. First, it is necessary to determine the need for personnel – to establish standards and requirements, to choose methods of calculating the number of employees. When determining the number of employees of the marketing department in each area, it is necessary to take into account the direction, level, number of business operations, stocks, number of suppliers, intermediaries and customers. The need for qualifications, that is, the need for a category, profession, knowledge, level of education, is calculated in accordance with the qualification component (job requirements specified in the job description), staff list. The calculation of the qualitative need is consistent with the simultaneous determination of the number of employees in each category. Personnel are appointed from internal and external sources.

In the new economic conditions, the direct use of force, as a rule, does not lead to the achievement of the goal for which it is used. Power causes resistance, to overcome which energy, time and other resources are spent, which are needed to satisfy consumers, create new products and services. Therefore, a leader is a person who does not need to use force and overcome resistance. Leadership is also characterized by such a trait as responsibility. The leader is responsible not only for himself, his decisions and their consequences, but also for his subordinates and for the entire business as a whole. Today, the usual functions of the chief and manager are disappearing. A completely different function replaces administration and control. The leader becomes a teacher, adviser, mentor and helper. A leader is a necessary condition for sustainable success.

Managers and leading specialists of the marketing department must meet the general needs of management personnel: professional skills, organizational skills, risk-taking skills, high ethical standards, etc. In addition, they must meet certain requirements determined by the selection of vacancies in the field of marketing: strategic knowledge, advanced analytical skills, the ability to anticipate the situation and make informed decisions.

The distribution of functions, rights and responsibilities between departments and employees in the marketing management system is of great importance in marketing management. The head of the marketing department performs direct functions between the departments and employees of the enterprise, which specialize in product development, production, sales, distribution of goods among customers, after-sales service, on the one hand, and consumers of goods – on the other. Employees of the marketing department conduct research of the business environment, educate first of all customers and competitors. With this in mind, they develop marketing strategies and plans, form directions for improving marketing activities, and convey relevant marketing information to other company departments. Thus, the marketing department affects the performance of all important business functions.

Appropriate organization of marketing communications with other divisions of the company. Effective communication between departments during marketing activities requires a balance of roles and responsibilities between them. For this, a map of the distribution of responsibility is used, showing the level and nature of the force, which reflects the scope and nature of the duties of each administrative employee in joint participation in the implementation of marketing functions, when the spheres of authority and responsibility of two or more people overlap.

Marketing management is implemented in management system of enterprises by trade implementation of a number of interrelated processes and are considered as a management system. Since he is a component

of strategic management and occupies central place, it can coordinate results activities and increase the efficiency of production, financial, innovative, organizational management and other types of it. Marketing management is not considered as a separate species management, but is formed in close connection with them. Marketing management is one of the main functional tasks of management, which is carried out in accordance with the requirements of the marketing plan, which is also part of the strategic plan of the business entity.

Marketing management should be considered in the general management system of the enterprise, i.e. in a holistic management system. Success will be achieved by the enterprise that creatively applies marketing management in its activities and is constantly looking for new ways to adapt to the constantly changing conditions of existence.

An even more complex concept is the second part of the conceptual base – corporate culture, which is formed by a set of the following components: one's own organizational style, principles, special methods of solving problems and decision-making technologies, one's own business practices, a code of values, as well as a peculiar system of internal corporate relationships. Based on this, corporate culture is a system of personal and collective values that are perceived and shared by members of the organization, as well as a set of techniques and rules for solving the problem of external adaptation and internal integration of employees, which have justified themselves in the past and confirmed their relevance in the present.

The purpose of organizational culture is to shape the behavior of personnel. In order to achieve this goal, it is necessary to solve the following tasks:

- development of the staff's sense of involvement in the company's affairs;
- support of individual initiative of employees;
- strengthening the stability of the system of social relations;
- employee qualification improvement and the possibility of career growth;
- creation of coordinated interaction between managers and staff;
- delegation of responsibilities [14].

The toolkit for forming and developing the corporate culture of enterprises is quite broad. Conventionally, it can be divided into two blocks:

- 1) customary forms and means: rites, ceremonies, traditions, rituals, legends;
- 2) specific tools:

- the universality of the sign and symbolic system, which contains names, signs, and the system of corporate identification;
- system of communication factors: "official" corporate language, colloquial languages, jargons, slangs, system of informal communication;
- activity and renewal of management and staff (stability, permanent rotation, interchangeability, distribution of rights and responsibilities);
- joint or separate work, training or participation in corporate events of employees who represent different social groups based on national, racial, gender, age, political, ideological, clan and other characteristics.

The famous economist and manager Thomas Watson, as the executive director of the IBM company, defined the importance of corporate philosophy and culture – components of the general conceptual base of the enterprise: "The basic principles of corporate philosophy and culture, the sense of spiritual community inherent in the company's employees, have a much greater impact on performance than technological or economic resources, organizational structure, innovation or time allocation. Of course, all this is also necessary for success. However, the main factor of the company's successful activity is the dedication of its employees to the basic principles of corporate culture and philosophy" [15].

Corporate culture and philosophy are of decisive importance for the enterprise, because:

- is a tool by which management controls, supports and develops production, commercial and even social processes;

- are the most important factors of the internal order, which determine the long-term effectiveness of the profile and territorial activities of the organization in the external environment;
- they form a certain system of values, which, in turn, forms the moral and social foundations of the corporate atmosphere (spirit) and the corresponding aspirations that underlie the viability and success of the enterprise;
- they "work" both on the formation and development of the internal environment of the enterprise, and on the formation and development of identified corporate features, which are revealed due to the specificity of multifunctional activities and the nature of the behavior of the business entity in the external environment.

The development of corporate culture is supported by certain ways and methods, such as:

- recruitment of employees who share corporate principles and values, or those who can easily adopt them later, and systematic familiarization of new employees with the basics of the company's corporate philosophy and culture;
- regular reminder in conversations with staff that, when performing their work, they should take into account, first of all, the company's value system;
- cultivation of legends, myths, fables and stories related to the company's history and activities;
- periodically encouraging those who adhere to the worldview and punishing those who disagree or violate it.

Corporate culture can be strengthened and developed by recruiting new employees, who are given the status of a "team member", whose inclinations, behavior and worldview correspond to the principles of the conceptual framework of the enterprise or contribute to its progress. A change of leaders or renewal of management can play a big role in changing or adjusting the conceptual base of the enterprise. Diversification of activities is often the reason for the transformation of corporate philosophy and corporate culture; development (conquest) of new markets; growth of the enterprise and change in its type and status in the corporate community; changing positions in the competitive environment (leader, vice-leader, outsider). To increase the predictability of the consequences of cultural dominance, it is necessary to clearly define what the culture should be, which cultural factors should be influenced, what threats and opportunities may be from the internal and external environments.

## CONCLUSIONS

The conducted research made it possible to conclude that marketing management does not have a specific definition as a concept, but it is customary to consider this term as the process of managing all links and departments of the enterprise on the basis of marketing in combination with the principles of management and control over all functions of the business entity.

Marketing management in the strategic management system of the enterprise involves the implementation of marketing principles in the management system, which means the priority role of the consumer in meeting his needs. The role of strategic management of enterprises is to create favorable conditions and resource opportunities for optimizing the activities of enterprises.

Thus, marketing management is a necessary element in the system of strategic management in modern market conditions with constant changes in the internal and external environment, the use of which allows you to increase the efficiency of enterprises, ensure a high level of their competitiveness based on the development of a detailed marketing plan, the choice of the optimal option for the formation of a future strategy development, timely detection and elimination of possible shortcomings. The direction of further research should be the development of management tools for the formation of an effective system of marketing management of the enterprise.

Necessary conditions for the rational use of qualitative personnel characteristics from the standpoint of HR marketing are the introduction of such measures as:

- directing manufacturers to search for material labor incentive systems that would correspond to the level of labor productivity and the characteristics of the enterprise's production activity;



- development of the system of personnel training and professional development, career planning;
- application of standards of social responsibility of business in order to develop and improve organizational culture;
- digitization and automation of personnel management processes;
- improvement of working conditions due to the creation of safe technological processes, effective forms of work organization and production;
- increasing labor activity and labor productivity, improving the mechanism of labor motivation. As evidenced not only by foreign, but also by modern domestic experience, it is the personnel that is today becoming a long-term factor in the competitiveness and survival of the enterprise. In conditions of frank weakness and underdevelopment of the domestic labor market, one of the most difficult, but at the same time, vital tasks for an enterprise is to ensure the effective work of HR managers.

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## ENVIRONMENTAL EDUCATION AND TRAINING IN UKRAINE

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### **ABSTRACT**

*Ecological issues, having reached a world-wide basis, form a new social reality. Nowadays, ecological knowledge, skills, and beliefs are of prime importance for the development of a new environmental friendliness and formation of a value perception of the world. The implementation of Ukraine's integration pursuits demands a compliance with the generally accepted environmental norms of behaviour by all the citizens of the country, which consequently requires a substantial revision of a structure and content of the educational process in the direction of strengthening the ability of young people for continuous environmental education on the principles of formation of civic consciousness and activity. Environmental education, aimed at the formation of skills of tolerant and careful attitude to the environmental objects, contributes to the formation of environmental competence of a prospective specialist, who would be able to deal with the problems of national economy and to solve the problems of rational nature management in a professional manner. Implementation of education in the interests of sustainable development is one of the priority tasks, and this is impossible without active participation of educational establishments, awareness of a need for sustainable use of natural resources and careful attitude to nature. An important link is an organization of educational process by informing children and youth about environmental issues. Children and youth are exactly those driving force that can influence a state of the environment in future. A successful solution to the complex environmental issues requires a transition to a new ideology of life, ecologization of economy and production, and formation of an ecologically oriented civilization. A key role in this will be played by the formation of a high level of environmental culture and development of environmental education in the interests of sustainable development. Nowadays, the ecological imperative and ecological paradigm should become the guiding principles in the practice of training specialists of any activity profile. Mentality of specialists of a wide variety of professions should become ecological. Formation of a new way of relations between people, technology and nature is a primary task of modern civilization. This means that environmental education, in particular its components, should be taken to the next, high-quality level. All these issues actualize the aspect of environmental education for modern Ukrainian society. The task of environmental education consists in the formation of life-values-based orientations of modern society and modern consciousness - their ecologization. Orientation of modern Ukrainian society towards sustainable development requires ecologization of education as well. Therefore, environmental education shall form a person's responsibility to preserve nature and to implement its vital value in practice.*

**Keywords:** *environmental education, environmental training, sustainable development.*

### **INTRODUCTION**

The current ecological status prompts a rapid restructuring of mentality of humanity and each particular person, formation of ecological consciousness and environmental culture. In this regard, environmental education and training becomes a new priority area of education. The experience of the EU countries shows that a state of the environment could be improved based on the principles of a country's environmental policy, a high level of environmental culture and active position of people in environmental protection activities. At the same time, a high level of environmental culture is not possible without environmental education, which shall be carried out on the basis of comprehensiveness and continuity of education. The issue of increasing a level of people's education based on the integration of knowledge [1, 2] and modernization of an entire educational space with elements of sustainable development [3] is becoming relevant.

Modern and urgent issues of the relationship between society and nature cause urgent tasks, and one of them is education of young generation able to coexist with nature in a harmony, to use it rationally and reproduce its natural blessings. This requires a commitment of environmental education to the possibility of pro-active training of a person for the transition to a strategy of sustainable development, which is a new principle of human common life, the essence of which is that future generations should have the same resource opportunities as are available now. Thus, society puts forward a need for a competent personality

who, based on independent critical thinking and responsibility, will be ready and able not only to identify ecological problems, but also to find rational ways to solve and prevent them [4, 31].

The way to a high environmental culture of society lies through the effective environmental education. The training of citizens with a high level of environmental knowledge, environmental awareness and culture based on new criteria for assessing the relationship between human society and nature should become one of the main factors in solving extremely urgent ecological, social and economic problems of modern Ukraine [5].

Humanity pays a high price for shortcomings of environmental education and training, because unawareness in environment protection often causes the global environmental problems [6].

In recent years, in Ukraine, as well as in many countries of the world, the concept of ecologization of education has been declared at the state level. Environmental consciousness should not be taught – it should be developed. Another reason for low level of environmental consciousness lies in the inactivity of a person herself\himself. Therefore, the ecologization of the entire system of education and training is an extremely relevant issue of the modern development of society [7].

### **ANALYSIS OF RECENT RESEARCHES AND PUBLICATIONS OR METHODS OF RESEARCH**

The methodological studies of H. Bilyavskiy, V. Bogomolov, V. Dobrovolskiy, A. Zakhlebniy, I. Zverev, L. Lukyanova, A. Nekos, M. Romanenko, V. Skrebets, O. Troshina and R. Furdudiy were of great importance for the study of content of environmental education. Besides, special attention should be paid to the works of Ye. Vershinina, I. Zyazyun, O. Kudryavtseva, V. Lypytskyi, N. Nasonkina, O. Romanova, and T. Tymochko, who not only defined the tasks of environmental education, but also tried to substantiate the specifics of environmental education. The scientific works of V. Kutuzov and M. Pokolodna, devoted to the aspect of environmental knowledge and environmental activity, which still have not been researched sufficiently, should be emphasized separately. The works of Ye. Glazunov, V. Gorokhov, O. Kilimnyk, M. Kiselyova, S. Podmazina, Ye. Podolska, M. Tarasenko, A. Chelingarova, dedicated to the study of system of environmental values and beliefs, environmental responsibility, their role in the ecologization of social consciousness, and general ethical ideas of life philosophy. In the studies of R. Amfield, V. Boreyk, Y. Bromley, N. Mankovskaya, Ye. Marushevskiy, M. Moiseev, L. Sydorenko shows a very important ethical and ecological aspect [8].

The work of many scientists, such as N.L. Avramenko, V. Andrushchenko, K. Bystryakov, V.O. Grachev, L.V. Yehorova, E.P. Zhelibo, O.I. Pometun and others are devoted to the study of issues of environmental education and strategy of a sustainable development un Ukraine [9].

The issues of mechanism of environment protection or its individual elements were the subject of study of such scientists as V.I. Andreytsev, A.G. Bobkova, M.M. Brynchuk, A.P. Hetman, S.M. Kravchenko, M.M. Kiselyov, V.S. Krysachenko, M.I. Khilko, Ye.V. Pozniak and others. The works of these authors constitute a theoretical basis for solving a number of problems in the field of environmental education and training as prerequisites for the formation of ecological consciousness and ecological cultures that correspond to the system of values in the modern society [10].

The issues of higher environmental education in Ukraine are considered in the works of many domestic scientists V.P. Andrushchenko, G.O. Bilyavskiy, G.A. Biletska, V.M. Bogolyubov, O.I. Bondar, O.P. Voytovych, N.O. Voloshina, M.I. Drobnohod, V.M. Isaenko, M.O. Klymenko, V.S. Krysachenko, V.P. Kucheryavy, D.V. Bast, O.I. Lyubynskiy, M.S. Malyovanyi, O.V. Mudrak, M.M. Musienko, V.Yu. Nekos, A.N. Nekos, V.G. Petruk, O.I. Pometun, N.M. Ridey, T.V. Sayenko, R.G. Synelshchikov, Yu.A. Skiba, S.M. Stepanenko, A.V. Tolstoukhov, M.I. Khilko etc. [11].

Main purpose of the chapter is to study the organization of environmental education and training in Ukraine.

## RESULTS AND DISCUSSION

Environmental education is a continuous complex process of formation of environmental outlook, environmental consciousness and culture of all strata of the population, social groups and society as a whole. This is a consistent mastering of the system of knowledge about laws of functioning and vital activity of all living world, ecological systems and a role of human in preserving the natural environment; process of environmental education and training, development of professional knowledge and skills necessary for environmental protection activities. Environmental education combines such components as environmental knowledge, environmental thinking, environmental outlook, environmental ethics and culture. The strategic task of environmental education is a development of scientific basics of environmental education, its gradual reformation taking into account the positive national and world traditions of relations with nature, and with proper consideration of the provisions of the Education Strategy in the interests of sustainable development, raising generations with a new level of environmental culture [12].

Environmental training is a continuous (throughout life) process of formation of traits, skills and qualities of human behaviour, her\his respectful and responsible attitude to nature, which encourages her\him to be active in environmental protection activities and in solving environmental problems. Environmental training takes place in the family, educational establishments and beyond them, with the help of mass media, natural history museums, centres and groups, public environmental organizations, etc. Environmental training is closely related to moral, ethical, patriotic, labour, physical, aesthetic, legal education, as well as environmental education with the same goals and principles. Recently, ecological and legal training, aimed at formation of legal culture of individual, knowledge of environmental laws, human responsibilities in relation to nature, compliance with the norms of ecological law and respect for them, has become increasingly important [12].

All over the world, more and more attention is paid to the environmental education and training. For this purpose, the concepts of development of environmental education and reformation of education systems with the consideration of environmental components have been developed and implemented at the state level for the purpose of transition to the development of society under the laws of sustainable development.

The problem with qualified, environmentally-educated staff is acute in modern Ukraine. The problem of environmental education and training of the Earth's population appears in the world's perspective as a main factor in human life and activities. At the current stage of society's development, a new type of education is needed to understand problems and their complexity more deeply as well as to determine the ways to solve them.

Conflicts that constantly arise in the relationship between human and nature as a result of traditional consumer's attitude to the environment, have placed the existence of higher forms of life, including human life, in jeopardy. This gave an impulse to scientific thought and practical activity of mankind to solve environmental issues. For this purpose, a number of international scientific conferences and seminars were organized and held starting from 1968, this fundamentally influenced the formation of environmental education and determined the strategy of its development. Environmental education had been developed and affirmed in the educational systems of many countries of the world since the 70s of the XX century. And for this, everyone should have at least some minimal environmental knowledge. Combination of all above mentioned factors determines the urgency of environmental education [13].

Environmental education is aimed at: professional environmental training, methodology and acquisition of fundamental environmental knowledge, public awareness campaign, and ecologization of special disciplines [13].

The general goal of environmental education in different countries is a formation of a culture of behaviour in the surrounding environment and careful attitude towards it. This includes the integration of natural-scientific and social-humanitarian knowledge as a factor in the formation of environmental responsibility, moral and ethical education as a component of environmental culture development, development of a responsible attitude to the environment and their health in young people [14].

The environmental education shall:

- 1) consider the environment from all angles: natural and man-made, technological, social, ecological, political, cultural, historical, moral, and aesthetic;
- 2) be a long-term process, in other words, it begins in preschool age and continues at all stages of formal and informal education;
- 3) be interdisciplinary in nature, to include special content in each subject, creating an opportunity to form an integral balanced perspective;
- 4) study the main environmental problems taking into account local, national, regional and international points of view in order to gain knowledge about environmental conditions in other geographical regions;
- 5) focus on current and possible environmental situations, while taking into account the historical perspective;
- 6) explain importance and necessity of local, national and international cooperation to prevent and solve environmental issues;
- 7) report on various aspects of environment in the process of economic and social planning and development;
- 8) provide the population with the opportunity to apply their knowledge and experience in planning, decision-making and determining consequences;
- 9) relate aspects of environmental sensitivity and knowledge of it, teaching problem-solving skills and clarifying values to any age group, but putting emphasis upon the development of understanding of environmental sensitivity in pupils of an early age;
- 10) help pupils to identify signs of environmental issues, as well as to study some of its acute real issues;
- 11) solve environmental issues and in this connection – need to develop critical thinking and acquire the skills to solve emerging problems;
- 12) use a diversity of examined environment and wide range of methodological techniques, acquisition of knowledge about environment [15].

The goals of environmental education have been determined based on its leading principles. First of all, to enable people to understand a complexity of environment, which is a consequence of the interaction of its biological, physical, social, economic and cultural factors, to promote awareness of the importance of environment for economic, social and cultural development [16].

Citizens of all categories, age groups and spheres of activity shall master the ecological knowledge, form ecological thinking, consciousness and culture. In accordance with the international requirements, globalization and eco-safe development shall be basic and primary ideas and methodological basis of environmental education. The main components of the system of environmental education shall be its formal and informal parts, forms and methods of which are different, but the goal is the same: all-round training of citizens who are able to study, understand and optimally solve social and ecological problems of the regions of residence based on the scientific knowledge of processes of biosphere development, sound judgement, common human experiences and values. The introduction of ecological component into the content of education is connected with a rapid development of production forces, which created a number of negative factors affecting the state of environment. At the current stage, the environmental education is a common task of humanitarian, aesthetic, social, historical and environmental measures. The content of this task reveals the unity of connections in the system “nature – human – society” [17].

The implementation of environmental education involves well-defined stages aimed at all age, social and professional groups of population [18]. The main components of the system of environmental education and training shall be its formal and informal parts, which have a common goal: development of environmentally competent individual who, based on independent thinking and responsibility, is able not only to identify ecological problems, but also to look for optimal ways to solve them [19].

Formal education covers all links of the general system of education existing in Ukraine: preschool, school, out-of-school, higher and postgraduate education. The second direction is a non-formal education; it has an educational nature and is aimed at formation of environmental culture of population through church, mass media, public environmental organizations, parties, etc. [7].

Formal environmental education and training are mainly focused on the transfer of special knowledge, mainly in the field of theoretical foundations of fundamental and applied ecology.

In the system of continuous environmental education, the most important is its first link – preschool education. The basic component of preschool education in Ukraine involves the formation of a child's sense of responsibility for what is happening around her/him and for her/his actions in the environment. The curriculum of children's preschool establishments shall be a basis for the formation of environmental culture in a child [20].

Today, school, as a basic educational establishment, shall provide a sufficient level of environmental knowledge and development of environmental consciousness and culture in young people based on modern criteria for assessing the relationship between human and nature. The close interaction of public environmental organizations with general educational establishments is necessary not only for the development of children's and youth's movement in Ukraine, but also for the establishment of pupil environmental organizations and associations on the basis of schools, which is one of pressing issues, a guarantee of the effective functioning of pupil self-government, the formation of civic, organizational and leadership skills in pupils [8].

At the current stage, the society requires of school education to provide the maximum development of intellectual abilities and formation of universal human qualities [21]. First of all, spiritual development of individual, inherent in the ecological way of thinking, environmental culture, morals and ethics. Therefore, it is exactly the school that shall play a main role in the formation of environmental thinking. School environmental education shall be implemented on the basis of ecologization of educational disciplines.

An important link in the system of environmental education is a network of out-of-school ecological educational establishments. It is necessary to create an educational environment based on the principles of sustainable development [22]. A qualitatively new result in raising the level of environmental education and development can be achieved due to the cooperation, and in the future – integration of school education with higher education.

Qualitatively new training of educator, school teacher, and teacher of a higher education establishment (HEE) who would be able to restructure the educational process in the direction of its ecologization on the basis of knowledge, acquired abilities and skills is especially relevant [18, 22]. She\he shall re-structure the educational process from transferring knowledge to examining a problem and developing possible ways of its solution. Environmental education in the higher educational establishments is distinguished by the formation of organizational skills in young people, for example, in carrying out environmental activities, striving for an independent solution to a particular environmental issue with obtaining a practical effect. It is necessary to involve students in ecological and educational activities. For this age category, it is important to carry out informational and educational activities with pupils of general educational establishments. Students, in the form of a conversation, with the help of presentations and self-shooting videos and movies for children of primary and secondary school, starkly illustrate ecological issues and need to be careful with the environment. In the form of training, students show and help high school pupils to justify ways to solve a particular ecological problem. And this stage is the final one in the ecological formation of personality and the culture of ecological human behaviour. Each of the stages of the formation of environmental consciousness, child – pupil – student – specialist, shall take into account the psychological age-specific development of individual [7].

Postgraduate environmental education provides a continuity of environmental education and includes a system of advanced training and retraining of civil servants, management staff of enterprises, organizations, institutions, entrepreneurs in the various aspects of environmental protection activities and rational use of

natural resources, environmental education of adults in accordance with personal needs and labour market, as well as training of highly qualified ecologists – candidates and doctors of science in the field of ecology and environmental protection, on the basis of leading establishments of higher education [12].

Non-formal education is a mass education and development of all strata and categories of population, both employed in the industrial and military spheres of activity, as well as beyond these spheres with the help of scheduled training classes, mass media (television, radio, newspapers, magazines, brochures, electronic media), organizations of permanent, stationary, temporary and mobile photo exhibitions of environmental content, environmental festivals (school, university, youth), skills contests, competitions, organization of thematic environmental popular scientific lectures by various environmental protection societies and public environmental organizations. Besides, theatres, cinema, local history museums, religious institutions, zoos, nature reserves, tourist and local history organizations shall also contribute to the informal environmental education of population [23].

An important step in the development of the system of a continuous environmental education, in particular, higher ecological education, was the development of the Concept of Environmental Education of Ukraine (KEEU), by a collaborative writing team (Bilyavskiy G.O., Bogolyubov V.M., Zaomostyan V.P., Levkivskiy K.M., Navrotskyi V.M., Pustovit N.O., Satalkin Yu.M., Safranov T.A., Stepanenko S.M., Shevchuk V.Ya.), approved by the Collegium of the Ministry of Education and Science of Ukraine, Minute No. 13/6-19 d.d. December 20<sup>th</sup>, 2001 [23]. Higher ecological education is a central link of the system of continuous environmental education in Ukraine, as it is directly and indirectly connected with the social and economic components of society and ensures training of environmentally conscious specialists who already have knowledge, abilities and practical skills in the field of ecology, environmental protection, balanced nature management and sustainable development. KEEU was the first important step in the development of environmental education and culture in the state, it played its positive role during the past decade, but today it has to be updated and upgraded taking into account all new legislative requirements, pan-European trends in the development of environmental education [11].

The concept of environmental education is an important regulatory state document determining the strategic directions and specific tasks of the development of environmental education of all strata of population, from childhood to old age, for the purpose of forming environmental culture and consciousness of citizens, skills and fundamental environmental knowledge. It considers the current state and perspective of the development of social knowledge, aimed at restructure of the content of education in accordance with the imperative of our time, at the formation of environmental culture as a component of the system of national and public education of all population groups. This document provides a basis for developing and implementing new programs of environmental education and development for preschool and school-aged children, as well as for students of vocational schools, technical schools, colleges and universities, as well as for managers of various institutions, specialists of various profiles, and industries [24].

Education was and remains to be one of the priority areas of social and economic progress in various periods of social transformations. Today, there is no alternative to sustainable development in the modern world, and education and enlightenment are irreplaceable means to introduce it into society. Environmental education is the most effective tool to form the environmental outlook [13, 28].

The need for environmental specialists is caused by a worsening of environmental crisis in Ukraine and its regions, suffering from irrational, unbalanced management, over-depletion of natural resources, industrial and domestic waste on an extraordinary scale. Economic stability of Ukraine, its ecological and national security are impossible without solution of environmental problems, which most important prerequisite is environmental education of its population. The necessity, generality, and bindingness of environmental education as a condition for the formation of environmental culture of society is determined in the numerous laws on environmental protection and documents on higher education in Ukraine. Thus, the field of study 10. Natural Sciences, specialty 101. Ecology used for students training, was approved by the Order of the Cabinet of Ministers of Ukraine No. 266 of April 29<sup>th</sup>, 2015 [25]. The growing urgency of the problem connected with the implementation of concept

of sustainable development in Ukraine brings up a question of improving quality of environmental education and development. The training of specialists who are able to perceive new requirements of ecological and economic policy quickly and to solve modern environmental problems effectively is possible only subject to further improvement of the entire system of environmental education and training, since the development of the national education system with its main component, environmental education, is one of the driving forces in the process of transition of the Ukrainian society to harmonious development. This is also due to the fact that the issues of environmental education and training go beyond national boundaries and increasingly acquire an international scale [24].

It is impossible to form environmental awareness and to solve this issue without a new educational model. Therefore, the environmental and educational model is considered as a component of the National Concept of transition to sustainable development for Ukraine and is an integral component of liberal education. It covers all population groups and all levels of education, and considers the functions of ecology in social life and is based on the traditions, customs and historical experience of the Ukrainian people to the maximum extent. The environmental and educational model provides for: subordination, consistency and integrative unity of educational and teaching processes, which will ensure a continuous increase in the level of environmental culture formation; development of scientific, educational and methodological basis for the formation of all links of continuous environmental education, including family education and education of adults; creation of anthologies, scientific publications and textbooks; development and implementation of new methods, original approaches to the optimization of educational process, etc. [24].

In virtue of the Law of Ukraine “On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030” dated February 28<sup>th</sup>, 2019 under No. 2697-VIII [26], the goal of the state environmental policy is to achieve a good state of environment by introducing an ecosystem approach to all the directions of social and economic development of Ukraine in order to ensure a constitutional right of every citizen of Ukraine to clean and safe environment, introduction of balanced nature management and preservation and restoration of natural ecosystems. One of the main means to achieve this goal is to improve the quality of education for the sake of balanced (sustainable) development, which will make it possible to establish methodological foundations and introduce continuous ecological education. Comprehensive ecological education and development of the younger generation shall be developed at an accelerating pace by supporting the activities of out-of-school educational establishments, ecological and naturalistic centres and naturalistic sections of children and youth, centres and specialized public organizations. A significant increase in the level of environmental education, enlightenment and teaching of citizens of Ukraine will create conditions for the introduction of sustainable consumption models into the everyday life of the citizens, activate their role in preventing pollution and monitoring the state of environment, sustainable use of natural resources, and restoration of the natural resource potential of Ukraine [24].

It is necessary to develop a professional responsibility for the preservation of environment, to develop a culture of attitude towards the natural world. One of the peculiarities of formation of a social, creative and responsible person is a development of positive motives for behaviour when communicating with nature. Reasoning from this fact, it is possible to determine certain aspects of the motivation of environmental training of a specialist:

- scientific and cognitive (study of laws, principles, and regularities of the biosphere system, understanding the mechanisms and consequences of human impact on nature);
- economic (assessment of economic value of nature as a source of human existence, natural resources for the development of modern society);
- ethical (feelings of kindness, compassion, desire to protect all living things);
- aesthetic (feeling and understanding of the beauty of nature, enjoying it);
- wellness (understanding of the value of nature for physical development and health preservation, striving to prevent its pollution) [17].



## CONCLUSIONS AND FURTHER RESEARCHES DIRECTIONS

At the current stage of human development, the role of environmental education and training is growing. The modern ecological situation requires a new moral view of the relationship between human and nature, new norms of human behaviour in the surrounding environment and a sense of responsibility for the future generation.

The formation of sustainable development and provision of the national ecological security of Ukraine is impossible without an appropriate level of environmental education and training of population.

Environmental education at all levels of education shall become one of the main factors in solving global ecological, social and economic problems of modern Ukraine. Environmental education and development shall be aimed at the formation of environmental consciousness in young people, their knowledge of the laws of nature, and understanding of essence of the relationship between living organisms and the surrounding natural environment.

High-quality environmental education is a necessary prerequisite for sustainable development of society, and besides, it is a goal of the modern educational process as the only possible means of continuation and development of human civilization.

The educational content of environmental education shall teach the preservation of ecological values, culture, which educates the younger generation at all the stages of life, especially during the period of formal and informal education.

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## CONCEPTUAL APPROACHES TO CREATING INNOVATIONS IN THE FIELD OF CROSS-BORDER TRANSPORT

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### **ABSTRACT**

*Innovation marketing is the basis for constant growth and development in all spheres of modern life, so the formation and development of innovations require close attention and a certain type of competency that specialists in various fields of activity must possess. In the field of cross-border transportation, innovations have certain specific, which motivates them to study these features in the conditions of modern reality. To create a successful innovation requires a clear and well-founded course of action, which motivates the study of various approaches to the analysis of the conditions identified as the sphere of influence of innovative solutions. This article presents an example of an analysis of the organization of the delivery of goods from one of the largest Ukrainian manufacturers of fast food products to customers abroad. Based on the results of the analysis, an innovative solution was proposed in the form of a mobile application that can be used to optimize and reduce the cost of cross-border transportation of goods. An analysis of the effectiveness of the proposed innovative solution is also provided.*

**Keywords:** *innovation marketing, logistics, cross-border transportation, mobile application, innovation analysis.*

### **INTRODUCTION**

Modernity requires constant, qualitatively new, and significantly influencing processes and phenomena, or "innovations." Such a requirement is often conditioned by the need for a more rational use of resources, consumer requests for the quality of manufactured goods and services, or some fundamentally new qualities of previously known goods requested by consumers. Whatever the nature of innovation requirements, a clear mechanism is needed for their development, formation, implementation in practice, and analysis of the impact on the final result of activity. In modern conditions, innovation marketing is one of the drivers of progress in various fields of activity, including the economy, since innovation processes affect all spheres of life. When studying the mechanism of the innovation process, it is worth considering it comprehensively. Since innovations often affect the field of engineering and technology to a greater extent, it is also necessary to consider the infrastructure that provides innovations, study the requirements for changing the labor skills of employees in order to timely correct training programs for relevant specialists, compare and identify possible economic problems in the implementation of innovations, and plan appropriate transformations in this area.

### **LITERATURE REVIEW**

The problem of studying the marketing of innovations is relevant, since an innovative idea in itself does not guarantee success and cannot always be translated into reality, since it is not objectively and logically complete from the point of view of practice. The study of a set of actions accompanying innovation and determining the degree of practical relevance will be considered in this article. To study the conceptual foundations of innovation marketing, one should consider historical examples that illustrated the emergence of innovation marketing, consider a modern enterprise that needs an innovative idea, analyze it and predict its effectiveness.

Scientific developments of well-known foreign and Ukrainian scientists such as I. Ansoff, G. Assel, P.R. Dixon, V. Kondratiev, F. Kotler, M. Porter, F. Hayek, J. Schumpeter, L.V. Balabanova, T.P. Danko, N.V. Kudenko, S.M. Ilyashenko, T.S. Maksimova, V.L. Pylyushenko, I.V. Semenyak, A.O. Starostina, I.L. Reshetnikova, P.G. Break, N.V. Kuznetsova and others.

Considering the various definitions given in the literature, to such a term as innovation marketing, they can be classified in two ways:

- in relation to the type of marketing activity;
- according to the way of action.

However, one should take a more global attitude to the marketing of innovations, since the quality of the resulting innovation as the final product of this type of action depends on the quality of the marketing activities carried out, regardless of the chosen methods of activity (Brem, Tidd, & Daim, 2019).

Innovation marketing is a set of measures aimed at identifying, structuring, algorithmizing and adapting new approaches to previously known types and methods of activity. A set of marketing activities can lead not only to an innovative product, but also to an innovative, fundamentally new solution to a specific problem that has been revealed in the course of marketing. For example, in the article [12], scientists do not offer a new project for mankind, but a project on the construction and organization of the work of a passenger transport hub that is quite relevant at the moment in Ukraine and is already successfully operating in other countries. Similar premiers can be found in other industries, not only in the field of transport services.

The marketing of innovations is a multifaceted and multi-purpose process, which in the gradient direction represents the desire for economic growth, technological improvement and the implementation of the whole range of economic activities at a fundamentally new, much more efficient level.

If we consider examples from different historical and economic eras, we can see that the type, structure and sequence of actions have changed, however, the essence of the process has not changed. Let's look at examples of innovations that have been driven by global diseases, as this is very instructive in the post-COVID era (Machado & Davim, 2022).

The most striking example is the plague pandemic of the 14th century, when, according to various sources, from 30 to 60% of the population of Europe died out. However, this pandemic has led to such changes as rapidly developing medicine, the functions of which until then were often taken over by the church with its prayers for the salvation of the soul and fasting to complete exhaustion. Following medicine, other sciences developed, the progress of which was held back by the repressive church organizations of that time. People began to pay more attention to personal hygiene, and the authorities began to pay more attention to the sanitary condition of the territories. Due to a sharp decline in the population, craft workshops, often representing family clans, began to allow outsiders to their sacraments. This means that crafts began to actively develop, that is, an opportunity was obtained to attract new intellectual opportunities. For the same reason, the cost of hired labor increased, and as a result, the standard of living of hired workers. In addition, more and more attention was paid to the mechanization of production. That is, scientific and technological progress has begun, so to speak. Labor shortages and mechanization opened up opportunities for women to take up crafts in the cities, which had previously been the prerogative of men. Therefore, the roots of emancipation also grow from these times. The destruction of the halo of divinity around the rulers who died during the epidemic, as well as ordinary mortals, led to a rise in the level of self-esteem of the lower strata of the population. And the increase in taxes, with the help of which the authorities and the feudal lords tried to keep the growth of the well-being of the masses, caused a series of uprisings and all this eventually gave rise to the Reformation of the Catholic Church and a chain of bourgeois revolutions that led to the change of the feudal system to a more progressive capitalist one (Aram, Baxter, & Nutkevitch, 2019).

The given historical example shows the consequences that have become innovations as a result of the pandemic. The COVID pandemic can also be considered in more detail in the future and can be classified as a prerequisite that led to innovation. Obviously, both external and internal factors, that is, processes, can serve as prerequisites for innovation, flowing within the enterprise and giving reason to think about the need for innovation.

## RESULTS

In general, various factors can serve as prerequisites for innovation. This is a decrease in the profit of an enterprise due to obsolescence of products, changes in the amount of available resources, their cost, changes in market conditions, including due to a change in the phase of the economic cycle. Such a complex of factors can be attributed to the economic prerequisites for innovation. However, there are other preconditions as well. The main prerequisites for the introduction of innovations at the request of consumers include a change in consumer requests for the properties and quality of the final product, a change in the age composition of consumers, a change in demand under the influence of factors caused by increased requirements for the quality of life. If we consider the prerequisites for innovation from a technological point of view, then their main driving force can be called the development of science and technology, as a result of which fundamentally new machines and equipment, materials and technologies can be obtained.

Consider an example of the development of a specific innovation in logistics. Since logistics currently lags far behind the growth in other areas and does not meet the requirements, the technology of the origin and development of a specific innovation in this particular industry is very interesting. As an enterprise for which the analysis will be carried out, we will choose Marven Food Europe LLC. Limited liability company "Mareven Food Europe" is one of the largest food enterprises of the Kyiv region, specializing in the production of fast food products. "Mareven Food Europe" LLC was founded on November 21, 2007 in Bila Tserkva, Kyiv region, Ukraine. The company belongs to the FMCG category, which characterizes the production of consumer food products. In particular, the enterprise is a subsidiary with 100% Vietnamese-Japanese capital of the international holding "Mareven Food Holdings", which has enterprises in Europe and Asia.

Also, the company's products are sold both on the domestic market of the country and abroad. At the moment, the products of "Mareven Food Europe" LLC are represented in more than 20 countries of the world. The enterprise includes various structural subdivisions that ensure the operation of the enterprise. "Mareven Food Europe" LLC has a broad organizational and management structure and consists of a management apparatus, that is, a directorate, 9 departments, 1 department and a factory, where the production of all products is directly carried out. Two departments directly organize the delivery of goods. These are the export department and the sales department in Ukraine.

"Mareven Food Europe" LLC sells its products under two well-known brands TM "Rollton" and TM "BigBon". "Rollton" is a trademark of this enterprise, which represents fast-cooking products in the form of various pasta products, mashed potatoes, seasonings, and traditionally prepared pasta products. "BigBon" is another trademark of this company, which is instant noodles with sauces and its unique taste qualities, and the product is positioned as a food for energetic people who are in a constant rhythm of life. The peculiarity of the products of "Mareven Food Europe" LLC is that they differ in quality and affordable price for the consumer.

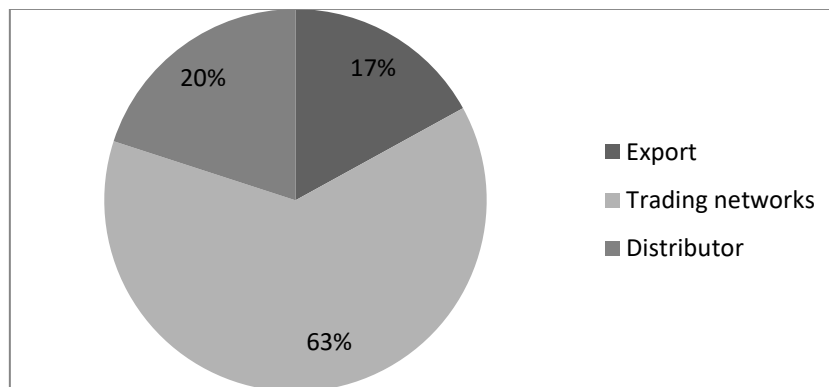
Cargo delivery of "Marven Food Europe" LLC is created according to the following types of shipments: SPEC, SPEC\_AP, STAN. For the type of shipment STAN, vehicles are used without the use of specialized means of transportation of food cargo. This type of shipment includes long-term storage products, the transportation of which does not require additional conditions, except for the norm of loading and positioning in accordance with the packaging and labeling of the goods.

The SPEC shipment type is characterized by the need to maintain the appropriate temperature regime. It should be noted that the transportation of perishable products, such as: confectionery, meat and fish, chocolate and candies, flowers and fruits, is strictly limited in time, but there are often traffic jams on internal roads, which can cause travel delays. Therefore, it is very important to maintain the optimal temperature in the refrigerator during the entire transportation, even if the temporary limit is exceeded. Refrigerated transportation requires high-quality containers and packaging materials for products. Materials and packaging must meet the necessary transportation standards. It is not allowed to transport goods in

defective or damaged container boxes, bags, boxes. High humidity, extraneous pollution, and unpleasant odors are also unacceptable.

To carry out transportation according to the shipment type SPEC\_AP, it is necessary to maintain both the temperature regime and maintain the real air humidity. To carry out this mode of transportation, you can use refrigerators and isotherms, which are additionally equipped with devices that do not allow you to adjust not only the temperature, but also the humidity of the air. Modern means to do this not only in the device for transportation, but also remotely.

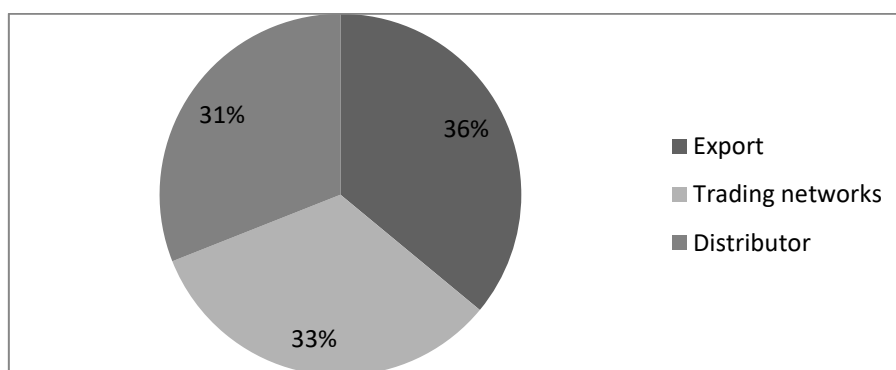
Delivery of goods of "Marven Food Europe" LLC is carried out by three main categories not directly related to the products - exporters, distributors and distributors. In 2021, 20,801 deliveries of goods were made for a total amount of UAH 6,058,881,817.00. (\$162,289,209) and with a gross profit of 3,973,895.66 tons.



**Fig. 1. Number of carried out transportations**

*Source: compiled by the author based on the reports of Marven Food Europe LLC*

In fig. 1 shows the number of deliveries of food products in 2021. As we can see, the main consumers in terms of the number of deliveries are networks (63%). Approximately the same number of shipments were made to exporters and distributors (17% and 20%, respectively).



**Fig. 2. Distribution of the cost of the delivered goods**

*Source: compiled by the author based on the reports of Marven Food Europe LLC*

If we consider the value component of the delivered deliveries, we have the following results. As we can see from the diagram in Fig. 2, the value component of goods deliveries is significantly different from the quantitative indicators. All three groups of recipients have approximately equal shares in the value equivalent, which indicates equal profit from various intermediate and final consumers. However, there is a small advantage in the value volume in favor of exporters, that is, it is advisable to consider the possibilities of development of activities in this direction in more detail.

"Marven Food Europe" LLC provides cargo delivery to many customers. Let's consider in more detail the customer base of the enterprise in terms of cross-border deliveries. The company's clients are many foreign companies, which can be obtained in more detail about the geography of foreign supplies left by "Marven Food Europe" LLC (Table 1). As you can see, the geography of deliveries indicates a developed cargo delivery system, that is, the company has some experience in cross-border transportation of food cargo. However, if we analyze the cost characteristics of the delivery of a unit of cargo, then this indicator does not always correspond to the distance in distance for a given delivery, that is, it is necessary to think about some innovative approach to the formation of cargo turnover in the field of cross-border transportation.

The information presented in Table 1 is a motivating basis for creating an innovative solution for the logistics system of this enterprise. If we consider the ratio of the cost of delivered goods to their mass, we can see that for the countries of the same region they can differ greatly, which leads to the conclusion that there is a need for a more transparent and open pricing system for the transportation of goods to end consumers.

**Table 1. Cross-border transport information for 2021**

No	Name of consumer	Country/es	Cost of goods, USD	Mass of goods, t	Cost/mass
1	Abdullatif Ahmad Al Arfaj Co. & Partner	Saudi Arabia	60,169	37,941	1.6
2	AL MERSAL TRADING COMPANY	Kuwait	155,108	61,173	2.5
3	AL WAZEER Company for General Trade/Ltd	Iraq	1,585,221	982,401	1.6
4	Albatros Scandinavia ApS	Denmark	609,898	316,244	1.9
5	Althuraya Sons International Trade Co.	Yemen	107,526	86,513	1.2
6	ASIL GROUP GIDA SANAYI DIS TIC STL SDN BHD	Turkey	34,874	26,129	1.3
7	BaltOven, UAB	Spain	174,424	52,421	3.3
8	Brand Masters BV	Netherlands	39,846,184	742,714	5.4
9	DAISENA UAB	Lithuania	5,945,444	3,001,683	2
10	DOLINA TRADE LTD	Israel	410,559	139,052	3
11	DUNIA DIS TICARET LIMITED SIRKERTI	Sudan	65,524	50,785	1.3
12	EKOL GIDA ÜRÜNLERİ SAN.VE DIŞ TİC.	Turkey	137,664	69,310	2
13	Euro-East Oy	Finland	643,913	301,155	2.1
14	FAL ALKHEER FOR TRADING IMPORT	Yemen	28,130	25,317	1.1
15	FOODNET ZRT	Hungary	222,409	176,463	1.3
16	FOTIADIS-CHRYSANTHOS ETHNIC FOODS	Greece	166,021	93,778	1.8
17	Gubernija Trade s.r.o.	Czech Republic	280,215	125,514	2.2
18	Intrade LLC	Georgia	276,288	177,325	1.6
19	Johanns SARL	Lebanon	614,119	467,427	1.3
20	Kontzoglou Bros Distribution Network SA	Greece	142,955	61,130	2.3

21	LOUTFI A. ALSHALFOOH Company	Palestine	126,676	57,426	2.2
22	MARATHON DISTRIBUTION GROUP SRL	Romania	9,715,253	5,351,731	1.8
23	Monolith (UK) Ltd	United Kingdom	745,596	300,926	2.5
24	Monolith Mitte GmbH	Germany	3,627,038	1,746,454	2.1
25	NORD-EXIM SIA	Latvia	7,137,630	3,715,671	1.9
26	Piwa Food Aktiebolag	Sweden	263,981	115,545	2.3
27	S.C. CVIN-COM SRL	Moldova	5,039,871	3,072,866	1.6
28	SI Commercial 7 Ltd	Bulgaria	2,844,367	1,544,908	1.8
29	SIPROMAD INDUSTRIE COMMERCE	Madagascar	189,610	123,318	1.5
30	SLCO GmbH & Co. KG	Germany	3,907,855	2,337,147	1.7
31	TRADE SUPPORT Włodzimierz Szybicki	Poland	4,958,387	3,133,379	1.6
32	TRUST me s.r.o.	Czech Republic	1,816,005	833,118	2.2
33	UK FOOD TRADING LTD	United Kingdom	4,204,152	1,720,642	2.4
34	White Lake Kft.	Hungary	1,225,858	751,656	1.6

*Source: compiled by the author based on the reports of Marven Food Europe LLC*

Existing services partially reflect this possibility, but practically there is not a single service that would allow conducting an open bidding system for the execution of a contract for the delivery of goods. Every company or organization that has its own fleet faces the problem of organizing the delivery of goods with the involvement of third-party transport. Accordingly, there is a need to obtain complete, non-stop active information about carriers ready to fulfill the contract for the delivery of goods from the manufacturer to the customer. These measures are now called "monitoring of free transport", or, in other words, a system of monitoring the performance of the contract for the supply of goods is being implemented.

Effective management of freight traffic, the organization of which is determined by the movement of goods from the producer to the final consumer, both domestic and foreign, is hindered by the following problems:

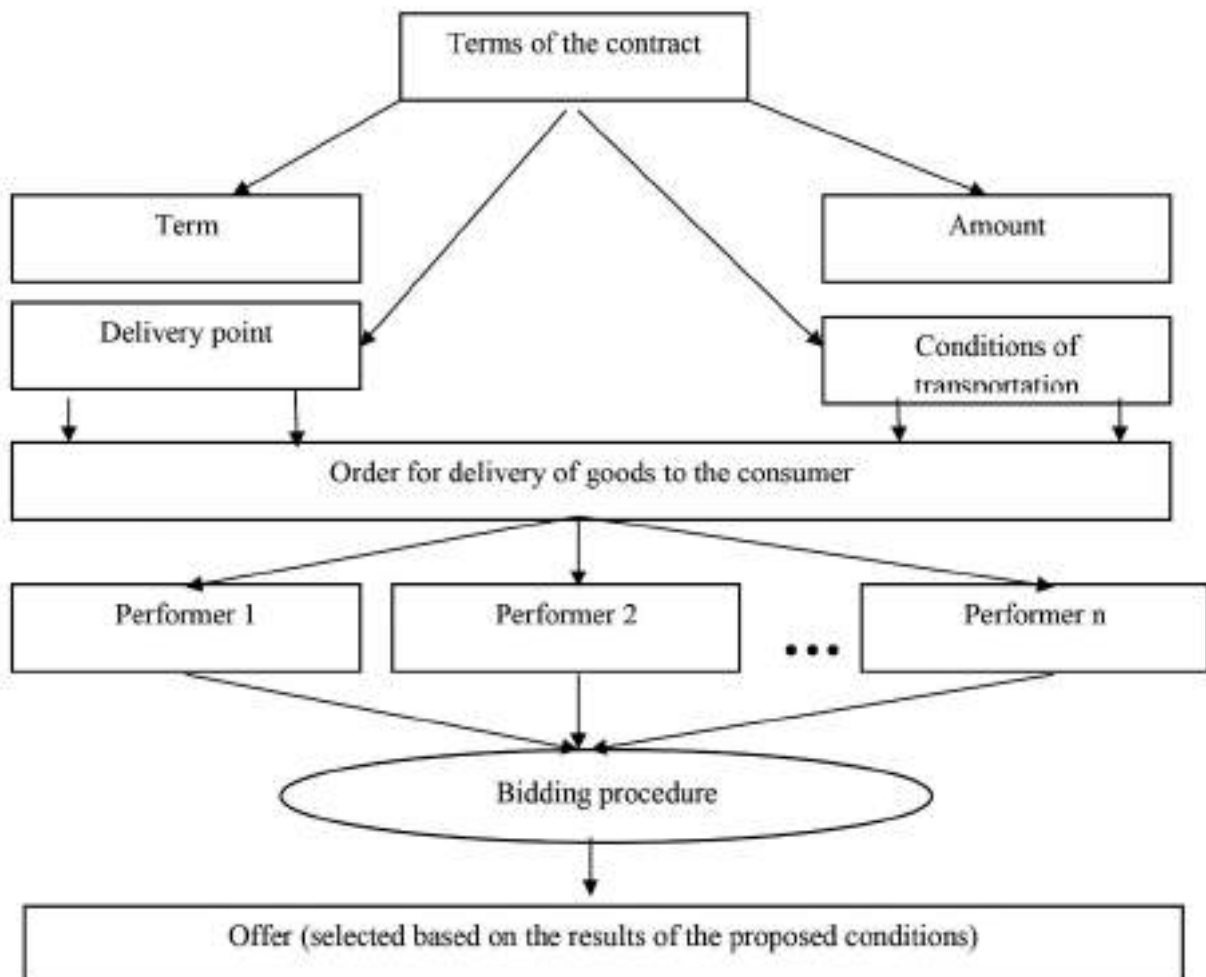
- unforeseen costs in the case of suboptimal selection of the carrier to comply with the terms of delivery of goods;
- impossibility to timely identify a carrier of goods that offers the most profitable option for cargo delivery;
- the difficulty of determining the real time of delivery of goods due to the incompetence of representatives of carrier companies with information about the specifics of specific routes;
- accurate determination of the actual mileage of the vehicle and the amount of fuel consumed.

The creation of a mobile application, with the help of which the executor of the delivery of goods from the manufacturer to the consumer will be selected, will solve problems with: determination of the optimal delivery route; organization of work on transshipment of goods from one type of vehicle to another; search for the most economically expedient executor of goods delivery; cargo insurance, as this service can be selected automatically if necessary, just like the insurance company; planning the work of individual specific production chains, the results of which must be delivered to the consumer (individual types of culinary products) in a short period of time with the fulfillment of appropriate sanitary conditions.



Real-Time Supply Chain (SCV) - Real-time data is now more in demand by more and more customers, which means that logistics and supply chain management companies need to focus on it. Currently, a large number of startups have emerged, whose solutions provide transparency of the supply chain, provide technology that facilitates rapid response to changes, allowing companies to use data in real time.

Such data includes traffic patterns, weather conditions in a certain area to the condition of roads or access roads to ports, which allows for the optimization of delivery routes (eg Hapag-Lloyd, Globe Tracker, Uber Freight and similar). All of the mentioned products differ from the proposed mobile application by the lack of contract bidding and feedback functions in one application. The proposed structure consists of two main modules - an order for the delivery of goods to the consumer and a formed offer. The order consists of the terms of the contract for the supply of goods to consumers. If we consider the list of executors, it is possible to propose a rating system for potential executors of orders, which will allow for a healthy competitive struggle for the fulfillment of orders for the delivery of goods to end consumers. This rating can be based on the results of previous orders. That is, information about the quality of order execution begins to be entered into the mobile application only after the start of its operation, that is, all potential performers initially have equal starting conditions. The structure of the proposed mobile application is shown in Fig. 3.



**Fig.3. The structure of the mobile application**

Based on the results of the execution of each order for the delivery of goods, the quality of the provision of transportation services is evaluated, that is, the terms specified in the contract are compared with the actual delivery terms, the presence of products damaged during transportation, the integrity of the labeling and packaging of products at the final destination.

The bidding system includes a system of offering the price of transportation of each specific batch of goods from "Marven Food Europe" LLC to the final consumer. In order for the trading system to work in automatic mode, the following sequence of actions is proposed. To receive information about existing orders for the delivery of goods, potential performers register in the application, open a personal account and choose a method of information convenient for them. When registering, each potential performer indicates their wishes. These wishes may include the following:

- receive information about deliveries with the appropriate weight (selected from the list);
- preferred directions of goods delivery (a list of final destinations is provided);
- active/passive work dates (dates on which it is not necessary to send offers for deliveries are selected from the calendar, i.e. days off or days required for vehicle maintenance).

When uploading information about the availability of an order for the delivery of goods to the mobile application, each potential performer will receive information about it in the way indicated during registration. After familiarizing himself with the conditions for the delivery of goods, he is offered to make a choice: he is interested in the offer, or he is not interested in the information received. If the proposal is of interest to the potential performer, he will be asked to enter the following data through the appropriate form: a proposal for the cost of delivery of the entire batch of goods; delivery terms; the term up to which the information provided by the potential performer in the relevant offer will be relevant.

Since the potential executor may have circumstances which will not contribute to the fulfillment of a certain order, therefore, the function of rejecting a previously made offer should be available in the personal account, however, this can be done only before the conclusion of the contract for the provision of forwarding services.

All offers from potential executors of goods delivery are displayed in the customer's personal account, i.e. in the representatives of the customer service of "Marven Food Europe" LLC. All offers are sorted in the following order: by the rating of the potential performer in the system, by the proposed cost of the delivery of goods, by the terms of delivery. The system selects the three best offers from which the specialist manually selects the performer and sends a request to confirm the execution of a specific order. When entering the confirmation into the system, the performer will receive a notification containing a proposal to confirm the previously specified information regarding the cost, terms and conditions of transportation of goods. Upon receipt of automatic confirmation, the application automatically fills in the contract and sends it for the electronic signature procedure first to the performer, and then to the customer, and a notification is generated for the end user with a list of contract conditions and a request to fill out the appropriate form after receiving the goods. After receipt of the contract signed by both parties, a notification about the start of the corresponding contract comes to the personal offices, the activity of which continues until the contract expires, that is, until the date and time of delivery of the goods and goes to the archive only after the consumer enters information about the received goods in a special form.

After the order is fulfilled, the system credits the executor with additional rating points for fulfilling the order. However, if the provided goods transportation services do not comply with those stated in the contract, the rating may be reduced.

To evaluate the economic efficiency of projects, a system of indicators is used, which reflect the ratio of costs and the results obtained from the implementation of innovations. The main criteria for the effectiveness of the introduction of innovations today are: the impact of innovations on the growth of incomes, satisfaction of service consumers, the growth of incomes from the implementation of new services, the improvement of labor productivity and the dynamics of profits [13, 14]. However, not only economic results should testify to the effectiveness of project implementation.

The component costs of this project directly include the payment for the development and construction of the mobile application in the amount of 405 thousand UAH (\$10,848), the costs of installing and implementing the system at the enterprise - 20 thousand UAH (\$535,71), additional costs for rewarding employees who participated in the project, and coverage unforeseen costs - UAH 100,000 (\$2678,53). The

total amount of initial investments is UAH 525,000 (\$14,062). The expenses of the following years include the payment of wages to additional employees for the maintenance of the system of program department specialists and the deduction of the social contribution (22%).

Forecasted revenues are associated with the growth of the company's competitiveness, the increase in reputation, the increase in trust in the company by customers, and, as a result, the receipt of larger volumes of orders, the increase in the number of corporate clients, the interest in the company's services and, as the main factor, the possibility of services for the formation of a delivery system for other manufacturers. That is, if there is demand - the expansion of the scope of activity of "Marven Food Europe" LLC in the direction of providing information support for the delivery of goods on the market of exporters, chains and distributors of food products in Ukraine.

**Table 2. Calculations for estimating net discounted income investment project**

Indicators, \$	Years				
	2023	2024	2025	2026	2027
Investments	10,848				
Income		15,000	18,214	19,017	20,464
Costs		1,800	1,859	1,942	2,000
EBITDA		13,200	16,355	17,075	18,463
Amortization		402	268	268	268
EBIT		12,798	16,087	16,807	18,195
Income tax		2,303	2,896	3,025	3,275
NOPAT		10,495	13,192	13,782	14,920
Operating money flow		10,896	13,495	14,050	15,188
Discount rate, %		35%	35%	35%	35%
Discount factor		0,741	0,549	0,406	0,301
Net cash flow	(10,848)	734	846	881	903
Net discounted cash flow	(10,848)	544	465	358	272
Cumulative flow	(10,848)	(13,519)	(13,054)	(12,696)	(12,424)

To obtain information about the effectiveness of the proposed project, we will calculate its NPV. This is a method of investment analysis, which is based on the determination of the value obtained by discounting the difference between annual outflows and inflows of real money that accumulates throughout the life of the project. To make the calculation, we forecast the following indicators (Table 2).

The impact of the implementation of the mobile application for the formation of an efficient system of delivery of goods to intermediaries and final consumers of the products of Marven Food Europe LLC is expressed in the change in net cash flow.

Let's evaluate the performance indicators of the investment project (Nagaraj, 2021). Net discounted income (NPV) can be found using formula 1:

$$NPV = \sum \frac{P_n}{(1+r)^n} - C \quad (1)$$

where  $P_n$  - annual cash receipts for  $n$  years;

$r$  - discount rate ( $r=0.35$ );

$C$  - initial investment ( $C=10,848$ );

$n$  - term of project implementation ( $n=5$ ).

$$NPV = 80.26$$

Since  $NPV > 0$ , the project can be accepted.

The profitability index (PI) can be found using formula (2):

$$PI = \frac{\sum \frac{P_n}{(1+r)^n}}{C} \quad (2)$$

$$PI = 1.15$$

The project is accepted because  $PI > 1$ .

Discounted rate of return (DROI=  $PI - 1=0.15$ ). DROI is greater than 0 – the project is accepted.

The discounted payback period can be found using formula (3).

$$DPP = \frac{\sum_{t=1}^n \frac{P_t}{(1+r)^t}}{C} \quad (3)$$

$$DPP = 2.48$$

That is, this project will pay off in 2.48 years.

## CONCLUSIONS

The proposed mobile application project can help streamline the delivery of goods, that is, create such a delivery system, which will be achieved in a fairly short period of time (less than 2.5 years), consumers will be able to receive products in the shortest possible time deadlines, both in Ukraine and abroad. If we consider the presented example of creating an innovation in the form of a mobile application, then it can be classified as a symbiosis of the technological and economic components of the innovation orientation. This component will be technological due to the availability of connectivity to its work for both customers and clients. It is also possible to coordinate the operation of the application with other software products available in the logistics industry, such as, for example, robotic warehouse accounting systems. If we consider the economic component, then in this case we get an innovation in the form of a bidding system for the performance of a contract, which is the basis of competitive struggle, which will be aimed at reducing the final cost of goods. Thus, this element of the innovative component will reduce the final price at which the products will be offered to consumers, and, as a result, will increase the turnover of the company ordering services for the delivery of goods. Fast and high-quality (that is, ensuring the safety of the goods) delivery of goods is one of the main factors of increasing sales volumes, and correspondingly the increasing of the income of the economic entity. In the context of recent events, namely the fact that in 2022 Ukraine became a candidate for membership of the European Union, Ukrainian enterprises have real chances to promote their goods on the European market.

Innovative processes are objectively necessary in modern conditions, socially and economically significant, morally and psychologically important for maintaining the company's constant growth, development and awareness of the need for further changes. Such a process cannot be chaotic, it is subject to constant monitoring and stimulation. Marketing of innovations can be considered not segmentally, but only in the complex of all marketing and management processes in the enterprise. Only an integrated, comprehensive approach will ensure the successful development of the enterprise through the introduction of innovations into practice.

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## THE ARCHETYPE OF THE MOTHER IN THE POETIC WORLD OF S. CHERKASENKO

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### **ABSTRACT**

*The article carries out a systematic analysis of S. Cherkasenko's creative heritage in a mythological way. The archetype of the Mother in the work of S. Cherkasenko is considered, which reflects his mythopoetic worldview and thinking. The main mythological motifs associated with maternal images are determined; the peculiarities of the interpretation of the archetypal image as a sacred image of the Motherland are clarified. The archetype of the Mother is a prototype that has absorbed all the ideal characteristics of the female world and reflects the enormous role of the mother in the formation of the personality and in the life of humanity in general. We prove that the mythologeme of the Motherland has its roots in the oldest and most stable archetype of Mother Earth. The image of the Mother at the initial stage was connected, first of all, with the nature. Back in Greek mythology, Gaia, Mother Earth, was the oldest of all the gods of the Greek pantheon. She gave life not only to all the gods, but also to the first human. Deference towards Mother Nature was also transmitted in the Roman tradition through the cult of Demeter and Rhea. In Slavic mythology, the most common is the syncretic image of Mother Earth, from whose womb everything living and non-living was born, because the land fertilized by rain produces crops, feeds people, and helps to continue the family. In Christian culture, the image of the Christian Mother of God is an echo of the ancient cult of Mother Earth.*

**Keywords:** *archetype, myth, mythopoetics, mythological analysis, mythopoetic model of the world, remythologization.*

### **INTRODUCTION**

Spyrydon Cherkasenko is a writer from Donetsk region, who more than 140 years ago dedicated his life to Ukraine through his vigorous activities in public and literary life, who during the difficult times in the history of Ukraine fought for the right of Ukrainians to have their own state, language, culture, and education (1910–1914). Taking into consideration the most pressing problems of the self-determination of the Ukrainian people, S. Cherkasenko in his own artistic texts borrowed and transformed, gave a new interpretation to mythological elements, which contributed to the integration of Ukrainian writing into the pan-European processes of remythologizing the life in the late 19th and early 20th centuries.

### **METHODS**

The literary heritage of this poet did not remain unnoticed by researchers, although it became the subject of research only in the early 1990s. The writer's creativity was studied in the works of many scientists. O. Myshanych was one of the first to start studying the works of the writer. L. Demianivska [1], S. Diachenko [2], O. Kuzma [3], O. Myshanych [4] and V. Pohrebennyk [5] studied the lyrics and lyric-epic of S. Cherkasenko. Social, educational and pedagogical activity of S. Cherkasenko in the Ukrainian society of the 20th century was traced by H. Kalantaievska [6]. V. Pohrebennyk analyzed the interaction of literary and folk factors in S. Cherkasenko's lyrics [5]. S. Khorob studied the dramatic works of the author [7]. The mythological aspect of the artistic interpretation of S. Cherkasenko's work was analyzed by M. Moshnoriz in her dissertation research [8].

The purpose of this study is to trace the mythological motives and archetype of the Mother in S. Cherkasenko's work, which will contribute to a deeper analysis of the creative heritage of S. Cherkasenko in a mythological way, revealing the integrity of the mythopoetic model of the writer's world.

The realization of the goal involves solving the following tasks: to determine the main mythological motifs associated with maternal images; to find out the peculiarities of the writer's interpretation of the

image of the mother through the reception of the archetype of the Mother and the reinterpretation of mythopoetic traditions in its depiction.

## RESULTS

The beginning of the XX century brings two schools of mythopoetic analysis to the key positions in literary studies, the mytho-ritual one or the Cambridge one, initiated by J. Fraser (J. Harrison, F. Conford, J. Weston), and the archetypal one or the Jung's one, the basis of which is the theory of archetypes of C. Jung (J. Murray, M. Bodkin, K. Still). Although in Antiquity the term «archetype» was used as a synonym for «idea», its authorship is attributed to C. Jung, who used it to denote the «psychic structure of the collective unconscious» [9, p. 49]. The sense of the concept of «archetype» acquired different meanings in the philosophical views of Platon, St. Augustine, I. Kant, and A. Schopenhauer, as an ancient form. Subsequently, the study of the archetypal character of an individual (Z. Freud) and collective (C.-G. Jung) consciousness in art was initiated.

With his research, C.-G. Jung almost completely supplanted the Freud's understanding of the archetype. Jung finally approved this term, seeing it as the main unconscious means of transmitting the most valuable human experience from generation to generation as subconscious symbols. In this way, he continued Schelling's traditions of studying archetypes. C.-G. Jung believed that the only source of archetypes are myths, which are fixed in the national consciousness in the form of indestructible matrix, unchanging entities that emerge from the programmed subconscious of each artist and direct his creativity. The researcher explained that mythology originates in the collective unconscious, where the archetype begins to function. C. Jung understands the archetype as a certain «symbolic formula» that primarily manifests itself in dreams and is a reflection of the «collective unconscious». Jung proved that «archetypes spread to the public not only through tradition, language and migration, but can always and everywhere arise spontaneously in new ways». The researcher emphasizes that archetypes are defined not meaningfully, but only formally: «it (the archetype) can be named and has an unchanging semantic core, but it is only – in principle, and never – concretely» [10, p. 113]. In his writings, the scientist singles out many archetypes, only two are feminine – the Mother and the Anima. Jung believed that the Mother archetype summarizes both the positive and the negative image of a woman [10, p. 19].

N. Frye applied Jung's theory in literary studies and gave the archetype the meaning of a «symbol-stereotype» that «constantly returns to literature» [11]. N. Frye was the first to note that archetypes, mythological images are contained in literary works, and the researcher is devoted to find them through a series of markers / codes. The Canadian philologist formulated the foundations of archetypal criticism of a work of art. The researcher singled out three types of use of myths in literature: «unreplaced» (where the world of people is clearly separated from the world of gods, which is characteristic of ancient literature); «romantic» (suggests an unspoken, directly mythical pattern in the world and which is closely associated with human experience); «realistic», where the myth is contained at the level of subtext [11, p. 113].

Taking into account the work of J. Fraser, K. Lévi-Strauss and C.-G. Jung, the Canadian scientist N. Frye considered archetypes not only as «primitive formulas» of individual images, but also as established models of ideas, themes, motives, rhythms, narratives, literary forms, genres. He was of the opinion that there is a general tendency in art to reproduce these formulas. Taking myths about nature as the basis of his research, N. Frye identified the key archetypal models of artistic systems. They are built based on the four myths: the myth of spring – comedy, the myth of summer – romance, the myth of autumn – tragedy, the myth of winter – irony and satire. From this point of view, art is an imitation not of nature itself, but of its mythological essence. At the same time, he singled out four main rhythms of literary works, which are consistent with the mythological matrix of subconscious reflection: 1) the rhythm of return / repetition in the epic; 2) the rhythm of continuity / integrity / consistency in prose; 3) the rhythm of external decency/majesty in the drama; 4) rhythm of association / connection / interaction in lyrics. Each of these archetypal rhythms is

characterized by specific archetypal thematic forms, motifs, images; and each plot can be correlated with the archetypal matrix of a certain ritual, which provides each work with a single order of words [11, p. 114].

In the «Encyclopedia of Literature» it is stated that «an archetype (Greek prototype) is an image, an idea, a primary motive, a theoretically probable form» and is divided into universal and ethnic archetypes [12, p. 96].

In this work, when defining the concepts of «archetype» and «mythologeme», we will, foremost, be guided by the views of C. Jung, Y. Meletinsky, V. Propp, V. Toporov, and V. Ivanov. If an archetype is a prototype, a permanent schematic invariant core, a skeleton of various mythological plots and motifs in their ultimate abstraction, then a mythologeme represents specific modifications, different manifestations, variations of the same essence, archetype. Each ethnic group has its own set of mythologemes. A mythologeme cannot be reduced to a specific myth; it can only be reconstructed (V. Toporov). For example, the archetypal image of the world tree can be expressed in the form of the Egyptian tree of life sycamore, the tree of the world Yggdrasil in Scandinavian mythology, an oak in Slavic mythology. Each mythologeme, having a completely independent meaning, is individual and specific. However, a set of specific mythologemes, created at different times, in different cultures, often independently of each other, frequently turns out to be connected with a single theme – an archetypal dominant.

In the work of S. Cherkasenko, the archetype of the Mother is multifaceted. This archetype appears in the following typical forms: Mother-Ukraine, Girl, Mother of God, White Woman. In a broader sense – a city, a country, the land, water, a garden, and others.

The archetype of the Mother is usually present in most mythologies of the world. In the mythological model of the world, the image of the Great Goddess is polysemantic, but most typically her image is identified with the land, and in a broader sense – with the feminine creativity in the nature. The archetypal image of the mother has its roots in the myth of Mother Earth, widespread in most peoples of the world. In the works of Ukrainian writers, the archetype of the Mother is also identified with the image of the Earth and represents, firstly, the source of strength, vitality and wisdom, on the one hand, and on the other hand, symbolizes the most reliable protection and support. In particular, P. Kulish created an original image of a Cossack hut-Ukraine decorated with «Danube shores» (poetry «Kozats'ka khata», 1890). In the works by I. Franko, a Ukrainian woman is saddened by the loss of her children («Ukraine speaks» 1898). And the banned in the USSR work («Instead of a prologue. Christmas Eve Tale», 1883) on the basis of vigil and oneiric poetics details the personified image of Ukraine, which has absorbed the features of the archetype of Mother Earth. In the works by Oleksandr Oles there is a «poor Ukrainian widow, surrounded by renegades», a long-suffering Ukrainian mother. In T. Shevchenko's works, the image of the Motherland is multifaceted with a spectrum of meanings: from a small orphan child to a widowed wife («Taras` night», 1838; «Do Osnov'yanenka», 1838; «Rozryta mohyla», 1843). In T. Shevchenko's lyrics, the semantic field of the mythologeme of the land includes the images of mother earth, the grave, the earthly paradise, and the steppe. In particular, the nationally colored mythologeme of the grave in «Perebendya» (1839) (as in all the artist's work) marks the spiritual place of the union of the soul with God, the place of historical memory, the locus of the revival of Ukraine. The mythologeme of Ukraine was shaped historically and politically acutely by «Velykyy l'okh» (1845). The image of the cellar is the sacred center of the mythopoetic picture of the world in mystery, which hides the national essence, the Ukrainian soul, the perspective of the nation's existence. The brilliant artist, against the hopeless obviousness, affirmed the indestructibility of Ukraine thanks to its «glorious past», which gives hope for the future. The author combines biblical motifs (the way of the cross of «orphan-Ukraine», the resurrection of Ukraine) with Ukrainian mythology (opposition of «black crows» to «white souls-birds»).

The most common form of the archetypal image of the Mother in S. Cherkasenko's poetry is Mother-Ukraine, Motherland-mother, Mother-nature, and Mother-Earth. The concept of the Motherland is one of the basic values of culture, a reflection of national archetypes and mentality. The theme of the Motherland,



patriotism, and the connection of a person with his land and people, peculiarly interpreted in ancient mythology, was actualized in the fate of S. Cherkasenko in 1923 after he was forced to move to Uzhhorod. The center of the mythic space of S. Cherkasenko's poetry is Ukraine (often likened to Jerusalem), which is associated with paradise, and the Ukrainian people are compared to the invincible Antaeus due to their tactile connection with Mother Earth. The author is convinced that any nation is unconquerable as long as it lives on its native land and cherishes the traditions and faith of its ancestors. S. Cherkasenko continues the Anteiv motif of the «natural» attachment of a person to his land in his lyrics. Admiration of its beauty and nature is the basis of his patriotism. This motive is reflected even in Homeric poems as a symbol of longing for the «small» Motherland. It is an essential aspect of the traditional understanding of patriotism. Symbols of nostalgia for the Motherland in S. Cherkasenko are leaning willows over a pond, the cry of a seagull in the steppe, and an unattainable star in the clouds. Ukraine is quiet waters and clear stars, green gardens, white houses, and fields of a golden wheat. Ukrainian nature in Cherkasenko's poetry is diverse, saturated with colors and shades (the cycle «On quiet waters, on clear dawns», 1919–1920). This established phrase, widespread in the thoughts of the «slave» cycle and historical songs, conveys the desire of captives to return to the Motherland. Not only S. Cherkasenko preserved this highly stylish tradition, but it is also manifested in the poetry of M. Rylsky («Word about native mother», 1941), V. Sosiura («Ukraine», 1944), D. Pavlychko («Granoslov», 1967) and others.

In the cycle «Our land is on fir» (1919), the archetype of the Mother is outlined through the motive of the need to protect one's Motherland from enemies. In its passionate way, the cycle renews not only Ukrainian existence but also opens up to the world a new existential perspective with the eternal Great Mother, always present at the basis of life. She gives life and blesses the armed defense of the Motherland: «О Нене рідна, ще не край, – / Ще хресна путь далеко в'ється, / Але ми дужі ще, – нехай / Лукавий ворог не сміється!» [13, p. 144]. The generalization of patriotic feelings comes at a time of dire danger for the Motherland: «Бо з великої любові / До рідненької землі / Буде бою, буде й крові / По потоках і ріллі» [13, p. 141].

The poetry projects an eerie prophetic vision, the speaker's eschatological myth-thinking. The mythology of the search for the lost Paradise dominates here.

The author transforms the cosmogonic myth in the poem «To the Sun» (1920). In Chaos, the mighty, fertile Earth gave birth to the boundless blue Sky – the Sun, which warmed the Earth. In the figure of a woman-mother, he recreated his native Earth. The author initially and expressively played the birth of the Sun by the Earth: «Огонь в душі твоїй не згас: / Ти розірвала зсохлі груди / І невгасимий серця жар / В піснях у наші переклала / І навела предивний чар, / Щоб Сонцем блиснув серед хмар, / Ти Сонце над усе кохала!» [13, p. 208].

In the poetry of S. Cherkasenko, female images, which are the personification of the sky, are a bifurcation of the same mythological image, which is a symbol of the personified earth as the mother of the human race: «Неба ясного усміх досвітній / В твоїх очах, / Ранок рожевий, ранок привітний / В твоїх устах» [13, p. 93]. In mythology, mother-earth is closely related to ideas about the «sacred marriage» of heaven and earth.

The author also realized the archetype of the Mother through the motif of the victim in the cycle «Octopus», where Ukraine is a young girl who fell «into the clutches» of the amorous young man-forester Octopus, who, as a monstrous enemy, convinces the young Ukrainian girl of happiness in oblivion. «Labels are affectionate» is not a trap for sailors to catch fish. On the contrary, they symbolize Ukraine's hopelessness in the quadrangle of death. To depict Ukraine, the author uses poetic means (fixed phrases) characteristic of Ukrainian love songs: «pink my flower, clear dawn». However, the author makes it possible to understand that behind erotic imagery is not love but the threat of destruction. This is a kind of warning to Ukraine for the future and a conclusion from the political experience of the author and the political fate of his country. The author uses the mythologem of the Octopus to generalize Bolshevism, which is related to the

fiery Star of the heavens, whose rays of light, like the tentacles of an octopus, pierce everything. In the diptych, there is a «kind, gentle Octopus», who does not carry a threat, «in whose arms, – he promises the girl, – you will find peace». But behind this peace, a threat is already felt. The motive of the victim who fell into the arms of the Octopus is confirmed by the requirement: «Не борсайся, дівчинко неслухняна». In the second poem, we learn that Ukraine is a potential new victim of the Octopus: «Ой люлі, Україно, рожевий мій квіте! / Спи тихо в лабетах пестливих моїх» [13, p. 267], which gives the work a national-patriotic orientation.

In the novel «The Adventures of a Young Knight», the archetype of the Mother Ukraine appears in the image of the Zaporozhian Mother Ukraine, the hiding-place-grave, etc. Let's agree with P. Miroschnyenko that «it was the historicism of romantic discourse that significantly corrected the laws of mythological time. The romantic cult of chivalry in Ukrainian literature, first of all, the cult of the Cossacks, expressed by mysterious, almost mythological plots, does not acquire an eschatological form due to the conceptuality in the romanticism of prophesying (the future), which is connected with predicting the future based on the past as the main component of the work of romantics» [14, p. 159]. The Zaporozhia Sich in the novel is a spatial core, a guarantor of national existence, and a cradle of chivalry: «Гей, мати Січ Запорозька! Не одного героя-лицаря виховала ти в своїм куріні, відколи побралися з козацьким батьком – з Дніпром-Славутою, й ще не одного виховаєш! Саме повітря твоє з телят творить відважних турів ...» [15, p. 117]. In this sacred space live real Cossack knights, in some places likened to earthly gods: «Перед очима все стояв образ величного, з довгою бородою й вусами лицаря із зсунутими над переніссям соболевими бровами, а під ними – гострими, як свердла, мудрими, допитливими очима, що зазирали – хотів ти того чи ні – в самісіньку душу» [15, p. 114].

Mythology is characterized by a dualistic view of the other world, so the images of the Cossack knights are ambivalent, combining the hypostases of the knight and the «knights from Nizh». The text «Adventures of a Young Knight» is oriented towards a heroic and mythological plot. M. Eliade noted that the ritual of initiation and the heroic myth are interconnected very often. In the novel, the myth is related to initiation through the vagina dentata, which is associated with returning to the womb of Mother Earth. This phenomenon is conveyed in work as the arrival of Paul to Sichi, who is personified, associated with the female firstborn and endowed with the miraculous power of transformation.

One of the negative forms of the maternal archetype, which is present in Cherkasenk's poetry, is the mythologeme of the night, identified with the motif of both physical and spiritual death. This combination is innovative in the literature. The mythologeme of the night in the image of a «bacchanal» – a woman unrestrained in the manifestations of her passion – acquires a negative meaning. The negative semantics of night mythologies is given by comparing the night with the beast («Але вже звіром лукавим чигає, / Деся притаївшись ніч» [13, p. 130]) and the apocalypse period («... Нехай довкола / Регоче ніч як сатана» [13, p. 133]). In particular, S. Cherkasenko's lyrics are characterized by the fact that the mythologem of the night has an anthropomorphic appearance, recorded even in the pagan worldviews of our ancestors. Mara is the goddess of evil, night, hostility, and death [13, p. 288]. No one sees her during the day, but at night she does her dark deeds: «Хто не втоне в царство сонне – / Всіх розбудить і розбудить / Мари сну і забуття» [13, p. 63]. The image of the Night Kingdom is characteristic of most Slavic ideas about hell. As in the poetry of S. Cherkasenko, hell is underground, engulfed in fire (similar religious allusions were embodied in prose by V. Stefanyk in «Paliy», 1942).

The dualism of life and death is revealed in the image of the night. In the lyrics of S. Cherkasenko, this mythologeme in the night city is a time when carnal passions and carnal desires are activated in the human soul: «Нічка дрімливая, / Нічка пестливая – / Мати кохання – / Розкоші, пестоців, / Любоців, лестоців / Родить бажання» [13, p. 96]. It is worth noting the romanticism of the text, which uses lyricism, is related to the poetry of Odarka Romanova. It is not by chance that the companions of the infernal night are Death, who sings a hypnotic lullaby, mother-Illness, black Sorrow, and dead Horror, characteristic of the

mythic symbolism of the misfortune of modernist poetry. In the city, the night plays the role of a mistress who dominates the entire city with its problems and worries.

In Greek mythology and the Ukrainian poet, the night is the «mother of the gods», which gave birth to Deception, Lust, Old Age, Death, Sorrow, Hunger, Oblivion, and Lawlessness. In the reception of the lyrical hero, a city is a place where all these sins are present: «Ніч убирає страждання, / Розпач, злочинство, і рпих» [13, p. 92].

In the cycles «The City» (1920) and «Children of the City» (1913), an effective means of constructing the maternal archetype is the contrast of poetics.

We are talking about the figure of a woman prostitute («Makes May Day»), a young lady in white from the same name poem, of a mother who leads a dissolute life, forgetting about her child. I. Frank-Kamenetsky notes that for the «figurative schematism of eschatological poetry, the semantic identity of "woman" and "city" is self-evident. From the point of view of social semantics, "woman" appears here not only in the image of "mother" but also very clearly in the role of the "bride". And it is enough to call the city by name, as it immediately becomes clear that the female image, like the city itself, is nothing but a symbol of the sky» [16, p. 225].

The author revealed the mythology of the city through the female image of the promiscuous mother. A prostitute combines her life with a «poisonous reptile», the author explains her sinfulness and contrasts her with the young lady in white – the embodiment of the «sacred marriage» of heaven and earth, the city's hope for a new life without the burden of sins. The Christian motif of punishment is woven into the fabric of the poem: «And I will not spare her children because these are children born of fornication because their mother committed adultery» (Book of the prophet Hosea, Ch. 2).

The city, the modern Sodom and Gomorrah, whose inhabitants drowned in debauchery, cannot expect forgiveness. It is significant that the author of the cycle uses the rhythm of a lullaby, reduced and caressing words, and repetitions characteristic of this genre of folklore and literature. We should agree with O. Kuzma that «the lullaby carries the semantics of a musical and verbal maternal amulet. S. Cherkasenko emphasizes the idea of "inverted" human values because, in the chaos of city life, the mother does not fulfil her direct obligation – to protect the child, to create an atmosphere of peace and security for her» [3, p. 108].

In the short prose of S. Cherkasenko, the archetype of the Mother is interconnected with the biblical motif of sacrifice, where the image of the Mother is projected onto the idea of the Virgin. In particular, in the dramatic sketch «Should» (1908), a mother is endowed with the unusual gift of anticipating the death of her only son, recognizing her son's departure by symbolic signs. In the life of a miner's family and a miner's settlement, there is a «dark, difficult period»: the soldiers come at night to stop the miners' uprising, and this is the most critical time for the miners to fight for social justice.

This time calls for civic activism. Therefore, the desire of the miner's son to help his «comrades» is understandable, despite his severe illness and the prediction of his death. The son's action is consistent with the biblical motive of Jesus Christ's sacrifice for the salvation of humanity. For the parents, such an act of the son is not understandable, and therefore they try in any way to leave the son at home during this difficult time. A mother, who is the family's guardian, feels her son's death, announced by disturbing dreams like no other. In particular, the mythological avian image of a raven, which the Mother saw in a dream, marks a premonition of trouble, misfortune, and death. In Slavic mythology, red is associated with the blood of warriors who died for their people in battles.

In Christian mythology, it is a symbol of the male firstborn, a sign of suffering, and the shed blood of the Son of God for the salvation of humanity. The focus of the author's attention is the suffering of a mother who anticipates the death of her only son. Unlike the biblical Virgin Mary, the mother could not come to terms with her son's sacrifice for the sake of others, so she did not let him into the mine, anticipating his death. She could not come to terms with the end, so she forced her father to protect her only son. Until the

climax (comrades brought a dead son), the mother's lines resemble wailing for the dead. The author dramatically modelled the death of his son as the extinguishing of a lamp on the family table.

And again, the author connects the outcome of the sketch with solar symbolism, which inspires hope for better changes in the future, and the advent of justice in society thanks to the death of his son.

In the second half of the 19th century – at the beginning of the 20th century – biblical female figures in literature overcame public opinion stereotypes. We associate this phenomenon with the desacralization of the image of a woman, the purpose of which was to reveal the psychologism of a woman's life as an individuality, unrestricted by the patterned life of a family and household structure.

In short prose, the writer transformed a new vision of the archetype of a woman who appears in the biblical hypostases of a woman who kills (Judith, the story «Judith»), a seductress (the story «The Endless Poem»), a socially active woman (Martha, the tale «Martha and Mary»).

The heart of the story «Martha and Mary» (1911) is a feminist theme – the activity of women in the social and political life of the country. To reveal it, S. Cherkasenko uses the Christian myth about the two sisters of Lazarus, Maria and Martha, who received Jesus Christ in their home. Martha diligently took care of the household to receive such an honored guest as best as possible, while Mary, at that time, sat at the feet of Jesus, listening to his sermons. The author raises the issue of a woman's life path choice in the story. Through the Christian images of Martha and Mary, he identified two possible paths for choosing: Martha symbolizes an active life, and Mary represents a contemplative life.

In mythology, a woman's betrayal, unlike a man's, has always caused condemnation and demanded severe punishment. S. Cherkasenko interpreted a woman's betrayal as an eschatology of the world of traditional values and family relationships. The mythologeme of female betrayal in the story «The Endless Poem» has a biblical basis, consistent with the Old Testament story about Eve's temptation by the snake and the expulsion of the first people from paradise.

Another hypostasis of the archetypal image of the mother in the drama «About what the sawdust rustled» (1916) by S. Cherkasenko is represented by the mythologeme of the warrior maiden. This phenomenon is atypical, very exceptional in the body of Ukrainian women in general. In the ethnic-mental consciousness of Ukrainians, the forms of this archetype are Mother Glory, Mother Bird, Zorinya, Magura, and Perunysia. O. Slonivska quite successfully characterizes the mythologemes of the Amazon and the warrior maiden in Ukrainian literature and sees the difference between them in «the reason for which a woman took up arms, and in how she, a woman, is personally affected by participation in systematic bloodshed. In addition, "warrior maidens" are no strangers to purely feminine experiences, up to great love for members of the opposite sex. On the contrary, the Amazon, having at some stage in her life become convinced of the catastrophic unreliability of her husband, almost always surrounds herself with women and is characterized by a special, artificially cultivated cruelty» [17, p. 608].

Sharing the views of O. Slonivska, Oksana is the embodiment of the mythologeme of the warrior maiden and strives to be spiritually equal to a man because a man can control his own emotions and feelings similar manifestations in others.

She has manly skills to survive and act in a critical situation when you can call no one for help. You can only help yourself when reason and sober calculation are necessary, and emotions and feelings are better left for later.

The reason for this, in our opinion, is «parental education», the strong influence of the parental figure in childhood since Oksana's mother died early. Therefore, Oksana has all the qualities to successfully realize herself in the external, «male» world: the talent of a tactician and strategist; the ability to lead men and call them to feats; the ability to use the mind as a weapon, sobriety and calculation.

The motif of dressing in clothes of the opposite sex is connected with Oksana's image. In Ukrainian literature, the idea of the «Cossack girl» can also be found in the story «The High Price» (1901) by M. Kotsyubynskyi, in «The Poem about the White Shirt» (1897) by I. Franko, «Thoughts about the Princess-

Kobzar» (1894) B Hrinchenko, in the novel «Tchaikovsky» (1843) by E. Hrebinka. V. Propp connects the motif of dressing up with initiation rites. O. Freudenberg interprets this motif in the gender aspect, that «female-male travesty» «is a metaphor for sexual fusion: a woman becomes a man, a man becomes a woman» [18, p. 221].

## CONCLUSIONS

Developing the literary tradition of Romanticism, S. Cherkasenko borrowed and transformed new mythological elements in his own literary texts, giving them a new understanding, and taking into account the most urgent problems of Ukrainian people's self-determination and their choice of freedom, which contributed to the integration of Ukrainian literature into European process of remythologizing existence of the late XIX early XX centuries. In various genres, S. Cherkasenko intends to imitate national mythology, borrow motifs, images and entire mythological plots, unconventionally reinterpreting and transforming the national and foreign mythological elements and producing his own national myth. S. Cherkasenko, continuing the literary tradition of the romantics, borrowed and transformed his artistic texts, giving a new understanding of the archetype of the Mother. The artistic paradigms of the writer in depicting this archetype and motifs of female themes are typologically similar and, in many cases, intertwined with the heritage of world literature. In most cosmogonic myths, the Mother Goddess is associated with the earth as the creative beginning that gives life.

The main characteristic of the Mother archetype in the mythological model of the writer's world is an ambivalent creative/destructive function. The Mother's positive image is dominant, outlined by various mythological motifs: the Mother of the human race, the intercessor, and the victim. The native land of Ukraine is endowed with a motherly or feminine face. She is a living being, a woman experiencing various emotions. She is a nurse and an intercessor who feels pity and longs for her sons, who have fallen on the field.

But the main motive is the lyrical hero's defense of his offended mother-Ukraine, and rescue of his stolen beautiful sister. Among the invariant archetypes that form the basis of the image of the Motherland in the work of S. Cherkasenko, the following can be distinguished: «Nanny-Ukraine», «Aggrieved Child-Ukraine», «Mother-Suffering», «Girl-Beauty».

In Cherkasenko's poetry, the mythologeme of the night is endowed with one of the negative forms of the maternal archetype, interconnected with the motif of both physical and spiritual death. For the Ukrainian poet, the night is the «mother of the gods», which gave birth to Deception, Lust, Old Age, Death, Sorrow, Hunger, Oblivion, and Lawlessness. Also, under eschatological conditions, in the poetry of S. Cherkasenko, the concepts of woman and city acquire a semantic identity. The author revealed the mythology of the city through the female archetype of the promiscuous mother.

In short prose, the writer transformed a new vision of the archetype of the Mother, who appears in the biblical hypostases of a woman who kills (Judith, the story «Judith»), a seductress (the story «The Endless Poem»), a socially active woman (Martha, the tale «Martha and Mary»). The Mother archetype in the drama «What Sawdust Rustled» (1916) by S. Cherkasenko is represented by the mythologeme of a warrior maiden who strives to be spiritually equal to a man because a man can control his own emotions and feelings and similar manifestations in others.

So, with the help of archetypal images, we reveal the original author's style, oriented to the folklore and mythological tradition, and highlight the constants of national culture present in the work of S. Cherkasenko.

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## FORMATION OF FOREIGN LANGUAGE READINESS FOR FUTURE IT-ENGINEERS' PROFESSIONAL APPLICATION

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### **ABSTRACT**

*The study is fixed on the middle and final test results after application person oriented approach in teaching future IT-engineers English for specific purposes (ESP). The core technology was a multi-level approach. The results were estimated in the percentage and absolute number. The final check of the used technology was presented in lexis, phonetics and grammar aspects of foreign language usage skills. Some creative tasks connected with their profession were also given to the students. The author analyzed the obtained results, named possible reasons of academic gaps and gave some teaching recommendations.*

**Keywords:** *person oriented teaching, multi-level approach, ESP, future IT-engineers, readiness to use a foreign language in the professional activity.*

### **INTRODUCTION**

In the modern, developing world, it is a necessity to modify traditional approaches to training students. They are not only to have sufficient knowledge but also to be universal specialists. A foreign language is useful in this process for finding actual information and communicating with partners. Thus, we applied one of the innovative teaching techniques, namely person-oriented teaching, to teaching future IT engineers. A multi-level approach was chosen as the basis for this teaching technology. That implies the possibility for the students to choose the task level according to their degree of readiness. The students' abilities and school preparation are rather different thus the offered technology could meet their needs.

### **LITERATURE REVIEW**

The considered concept combines the notions of readiness and the person oriented teaching. The issue of person oriented teaching was explored in the works of I. Bekh (1998), K. Bondarevskaja (1996), I. Pidlasyi (2009), Y. Polat (2009), V. Yagupov (2002). The essence of readiness was researched by the following scientists: L. Bekirova (Bekirova, 2015), O. Bodalyov (Bodalyov, 1988), N. Hurtovenko (Hurtovenko, 2014), L. Kandybovych (Diachenko, Kandybovych, 2001), I. Halushchak (Halushchak, 2013), I. Uznadze (Uznadze, 2004).

The main goal of the article is to present and analyze the results of the pedagogical experiment aimed at future IT-engineers' formation a foreign language readiness to use English in their professional activity.

### **RESULTS**

Modern world requires a person with universal skills, who is able to apply knowledge according to the production needs, to explore new technologies and individually master innovative developments due to the circumstances changes in the country economic development.

We support the scientists N. Bazeliuk, M. Rybalko and V. Stepanov in their statement that "concrete knowledge is getting old very rapidly in the informational society, thus the first place is occupied by the ability to independently find the necessary information on the electronic and paper carriers, to use various information for solving new practical problems" (Bazelyuk, Rybalko & Stepanov, 2012). It is especially important for future IT-engineers since new developments in IT appear mainly abroad. Thus a person's ability to trace and take into account innovations by means of a foreign language becomes a prerequisite of professional success.

To satisfy these needs we applied a person oriented teaching ESP among the students of IT. The basis was multi-level approach. The students were given an opportunity to choose among three levels of doing tasks according to their knowledge level in every particular case. The forming experiment was provided via observation, interview, discussion, middle and final tests.

In teaching ESP the key aspect is learning professional terms and mastering grammar skills. Here we will consider the obtained data, presented in the table 1. It is necessary to state, that EG is experimental group, CG is a control group and AN is an absolute number.

**Table 1. Final test results**

Tasks	Correct answers			
	EG		CG	
	%	AN	%	AN
Lexical skills				
1. Match professional lexical units	100	216	85.8	181
2. Choose synonyms among the terms	51.4	111	22.7	48
3. Translate professional word-combinations	61.5	132	33.1	70
4. Translate professional sentences	38.8	84	18.9	40
Grammar skills				
1. Use The Present Indefinite Tense in the professional sentences	87.1	188	80.1	169
2. Use The Present Continuous Tense in the professional sentences	100	216	87.6	185
3. Use The Present Perfect Tense in the professional sentences	67.1	145	58.7	124
4. Form degrees of comparison of the adjective terms	43.9	95	37.9	80
Phonetics skills				
1. Define the ending pronunciation of the professional verbs	43.9	95	25.1	53

*Source: Kolisnyk (2018).*

Matching of English words with their Ukrainian equivalents enable us to define a student's level in using specific lexical units. The representatives of the experimental group manifested their excellent knowledge since the correct answers were 100 %. The majority of the control group students gave 85.8 % of correct answers. We referred six-ten correct answers to the category "correct answers". Partial answers implied from one to five lexical units that seldom happened among the analyzed works. The received figures prove the future IT-engineers' high level of usage professional lexis.

Evidently, that application of many synonyms demonstrates a rich and expressive language and it also characterizes a speaker as a high-qualified professional. That was the reason this theme was among the items in checking lexical aspects of the future IT-engineers' foreign language readiness to use a foreign language in their professional activity. The first task was to name similar words to the given lexical units. The task was made easier as it was necessary to name the learnt professional lexical units giving synonyms to the presented words from General English. The results are the following: 51.4 % in EG and 22.7 % in CG. The students got used to similar tasks while studying, so they easily managed to cope with it. Among the absorbing factors one can name the following: systematic performing similar tasks, explanation of the differences between synonyms, performing various exercises on their usage, and a particular attention to the individual reproduction of the synonymic lines.



False answers are given due to a number of reasons. If a task is given in English, it can embarrass the students while doing a test. Thus we fixed incorrect performing when they just gave translation of the given words. It can be not the lack of knowledge, but a false understanding of the task, lack of time, common inattentiveness, and unwillingness to ask for explanation.

There were also some students who made mistakes in spelling words. As it is known English spelling is very important since there are a number of homonyms which radically change the word meaning. For example there are such homonym groups as steel – steal, sell – cell, where – were – ware and many others. The problem is not remembering but spelling of the lexical units.

In general we see some ways of correcting such mistakes. In particular, emphasizing the importance to define the unclear moments, since reasking promotes correct doing of the exercises. It is necessary not only to explain the importance of using synonyms as alternative means of conveying thoughts but also to inoculate the students' desire to learn at least one or two synonyms to the learnt lexical units. Involving students to such exercises it is important to give an opportunity to find synonyms among the given words, but also to offer their own variants. It will promote in its turn the development of creative thinking.

Recollection of the learnt words, restating their semantic links, variation of sentence translation using synonyms should be common practice of the educational process. Oral communication is very important, however attention should also be paid to spelling words.

One of the important aspects in learning is the capacity to translate word-combinations, which reveals knowledge of the lexical units and skills to combine them together. This task is of vital importance since it makes the next phase in forming the students' foreign language readiness. We received the following results: 61.5 % in EG and 33.1 % in CG. The sufficient accomplishment of this task confirms a high level self-confidence concerning foreign words translation. Together with others this practice is a significant achievement in the psychological aspect of the educational impact. Though we fix some mistakes, still the majority of the word-combinations were translated. However we counted only those answers which were used and spelt correctly. We trace persistency and confidence in conveying a speakers' idea.

There are a number of reasons for correct answers. First of all it is due to constant practice at the lessons in a form of separate word-combinations and sentences translation, answering the given questions, independent utterances in a foreign language etc. Besides, texts are usually taught in blocks where the main element is word-combination. Thus the students are actually reproducing the learnt material. We can name some considerable factors contributing learning of the translation skills, such as: frequent usage of terms while doing oral creative exercises; logical and sequential material delivery, where every consequent text is connected with the previous one in a lexical and grammar aspects; well learnt lexical units of the worked out texts (Kolisnyk, 2016).

To sum it up it is necessary to recommend repetition of various parts of speech, including prepositions, which perform a linking role between the words within a word-combination. They often differ from Ukrainian equivalents, so they should be learnt distinctly. For example: to depend on (but not to depend from), to enter the university (but not to enter to the university), to marry somebody (but not to marry with somebody). Usage of wrong prepositions proves insufficient level of language knowledge that is characteristic for foreigners.

Since a communicative aspect is always in the priority of learning a foreign language we should state that the students can correctly apply the received knowledge first of all in oral speech. Trying to express one's thought a person is usually helped by an interlocutor, and thus they reach the main purpose of communication – exchange of information.

The next stage in mastering a foreign language is translation of sentences. According to the gained results this task reveals students' complex knowledge and skills, in particular, grammar skills to link different parts of speech with each other and form sentences, lexical skills to find appropriate words and correctly arrange them, ability to remember and convey information in a foreign language. As a rule only

high and middle level students undertake the accomplishment of this task, the representatives of the low level usually refuse doing translation.

The received data of the correct answers (38.8 % in EG and 18.9 % in CG) prove our supposition concerning appearance of positive results of the academic activity with the usage of person oriented teaching on the basis of the multi-level approach technology. It was proved by the fact that the performers' group consisted of the students who at first considered themselves to be low level representatives. While translating, they showed their readiness to perform more complicated tasks and a desire to gain sufficient knowledge in English. Translation need arises in search of information on innovative foreign research, writing articles in a foreign language for Ukrainian or foreign journals, making summaries, communication with foreign colleagues at the international conferences etc.

Applying personal experience it is possible to name the factors contributing success in this activity: systematic creative tasks on usage given information in a dialogue or text making one's own story; logical connection of the texts which implies numerous repetition of the learnt material; grammar knowledge received during studying is used while grouping words in sentences; psychologically comfortable situation with the possibility to make one's own choice of tasks according to the learnt theme level; knowledge absorbing; abilities to considerably express one's own thoughts; students' studying experience.

Notably, that the respondents have done this task quite successfully and they can communicate with foreigners about professional topics. That was the exact purpose of teaching that discipline. We support the statement made by the scholar O. Luchaninova that "person oriented approach does not deal with forming a personality with the given traits, but it creates conditions for a learner's complete reveal and development of personal functions" (Luchaninova, 2012). Thus it is about raising psychological and learning exponents and creation of independent conditions for a person's full development.

An ability to appropriately use various categories of tense is an important aspect of a foreign language communication. The task was fixed at reveal of temporal circumstances characterizing a particular tense.

General communicational direction of the discipline "English for Specific Purposes" is aimed at teaching students to communicate in a foreign language. Therefore a grammar aspect is not the priority in this situation. Greater accent is given to the lexical content of a lesson and an ability to use term word-combinations in professional situations.

Besides, young people often have some psychological sets which interfere with studying and decline their desire to understand learning material.

To properly understand grammar level knowledge in English we offered the students to use three most used verb forms. The theme "Present Indefinite Tense" turned to be understandable for the majority of students (87.1 % in EG and 80.1 % in CG). It is evidently that the others have not noticed the characteristic time signal of this tense form and have not compared the proposed sentences. There exist some reasons of the low exponents in grammar. Among them we name heterogeneous group composition, where students have various general education training. While some students revise the material and demonstrate high level knowledge, the others have to learn grammar themes from the very beginning, starting with fundamental rules.

To improve the learnt verb forms level it is recommended to regularly revise theory and do exercises with explanation on some grammar phenomenon usage. Notably that a frequent mistake is omitting any endings while there exists only one exception – usage of the ending "s" in the third person singular. In terms of it learning this aspect is a prerequisite of the successful mastering this theme.

Verb tense forms like any other grammar tasks at first cause some problems. However after regular doing such type exercises, explanation of mistakes and clarification of the misunderstood things a person gains studying experience. We frequently fixed increase in interest among the students who understood at least one grammar theme. Then their self-esteem rises they start believing they can do it and there arises a desire to study and self-improve. This stimulates them to be more persistent in studying, and their teacher should keep supporting their cognitive interest.

The scholar K. Shamanska offers various devices for increasing a cognitive interest. They include the following “demonstration of the visual facilities, technical teaching means, providing the process of the new material presentation with good examples and facts; making problem situations which stimulate internal contradiction between new cognitive tasks and insufficient knowledge level for their solution; a teacher’s ability to provoke interest to might and potential of a human brain in cognition in-depth natural phenomena, scientific and technical development; non-traditional forms in organizing an educational process (lessons-competitions, linguistic battles, role plays)” (Shamanska, 2010). Just usage of extraordinary lessons in forms and contents is able to stimulate students’ cognitive interest and encourage to deeper learning the discipline to solve particular problems in cognitive tasks.

At the next stage the students showed somewhat better results (100 % in EG and 87.5 % in CG) while demonstrating their skills to form The Present Continuous Tense. This theme is usually easier learnt due to available characteristic time signals. Taking into account the obtained results we can conclude that a grammar action in progress was learnt by the majority of students

There is an assumption that the most difficult grammar tense is Present Perfect. It requires more mental efforts due to the complexity of its formation and usage of two different ways for forming participles. The obtained results are the following: 67.1 % in EG and 58.7 % in CG and they prove the assumption.

It is evidently connected with the duration of the educational process at the moment of doing the test. The difficulty can also be caused by the complicated rule of sequence of English tenses.

While learning Perfect Tenses attention is paid to the completion of an action, which is mainly revealed by time signals. However there are some connected sentences which should be coordinated. That was the first task.

It is understandable that profound knowledge of the verb tense forms prove a good mastering of a foreign language. Among the factors of weak learning grammar there is greater communicative aspect of an educational process, which emphasizes the utterance contents rather than its grammar mistakes. As a proof of this hypothesis one can name the facts of communication with foreigners in Ukrainian. They often use an indefinite form of a verb (infinitive) to express some tense, they use plural nouns in the singular form, mix similar words, and still it does not prevent Ukrainians from understanding their general idea.

No doubt it is necessary to correct mistakes. But it should be done after students’ speech in order not to interfere with their further talking, not to negatively influence their self-esteem and not to destroy their desire to answer at all due to the fear of possible mistakes.

As our experience proves, a prerequisite of learning grammar is a combination of theoretical explanation about formation of some phenomenon and practical usage with well-thought examples. It is also useful to do exercises on the comparison of tense forms, in particular translation from Ukrainian into English. For example, the words ”ходив”, “пішов” should be translated as “went” (it denotes a past action as a fact), and the forms “прийшов”, “сходив” have other equivalent – “has gone” (Present Perfect which denotes the action result and it’s correlation with the current situation). In the first example we know that the action was started, and the second example emphasizes its completion and positive result of returning. Thus a teacher should once again draw the students’ attention to this difference, giving differences between similar tense groups and explaining typical mistakes (Kolisnyk, 2016). Weak general education preparation is noticed for a long time. False sets concerning “difficult grammar” are not easy to overcome. It sometimes happens that students learn complicated themes like participle, but at the same time they keep making mistakes with the plural of nouns. So the scientist O. Liashenko believes that it is not sufficient to limit with only verbal-communicational and logical-communicational constituents in the test of general educational competency, “it is preferably to expand its competence basis supplementing it with such important components as using informational-communicational technologies and communicative skills to speak in a foreign language” (Liashenko, 2015). In terms of this the higher education institutions teachers should not only regularly revise learnt material but also offer their students other forms of using

grammar like making reports, description of the specific subject etc. It is impossible not to use grammar while doing such tasks at the same time concentration on exciting contents.

Demonstrating their knowledge of adjectives the students were to recollect ways of forming degrees of comparison, criteria for application certain way as well as some peculiarities in their spelling. The respondents demonstrated the following results: experimental group – 43.9 % and control group – 37.9 % of the correct answers.

There are some reasons of bad learning degrees of comparison. Though adjective is an important part of speech, but teachers pay little attention to it at the lessons. The majority emphasize a verb with its different forms and categories (tense and voice), as they form perception of any utterance. The other reason is connected with spelling peculiarities of some adjectives while forming degrees of comparison. Thus we have: heavy – heavier – heaviest (change of the final y), big – bigger – biggest (double b). Due to this even correct forms of adjective degrees (by means of adding suffixes or auxiliary words) had some mistakes. They were also considered incorrect.

Knowledge gaps on the mentioned theme should be eliminated. While training some lexical topic it is possible to attract students' attention to adjectives spelling peculiarities in forming degrees of comparison and recollect rule exceptions. Teaching verb categories one can offer exercises in forming degrees of comparison with active lexis. It is recommended to broaden the students' vocabulary with the varieties of simile with conjunctions like as ... as, not so ... as and others.

One more aspect of a foreign language readiness is phonetics. Though checking of phonetic skills in the written form seems unreal at first, it is quite possible. To do this we offered the students to divide Participle II of the regular verbs into three groups according to their ending pronunciation. As seen from the received results (table 1) the majority of students have coped with the phonetic task. Some students (43.9 % in EG and 37.9 % in CG) made it completely correct, the other group coped with the task only partially (41 % in EG and 23 % in CG). We consider the received data to be sufficient since phonetic skills make up only part of the general abilities and gained skills – it is the result of the teaching process in the higher education establishment. However they make phonetic mistakes caused by a number of reasons, including insufficient time quantity for the detailed explanation of the basic phonetic norms in English. They have to choose the most important aspects, in particular correct pronunciation of the Participle II endings since its application except as a separate part of speech takes place in the perfect tenses, passive voice, infinitive forms and it is identical in forms with usage of regular verbs in the past indefinite.

Since school teachers usually pay little attention to the correct pronunciation of the regular verbs ending in the Past Indefinite, that is quite evident from the respondents' speech, university lecturers often have to re-teach them. However violation of the set stereotypes as a rule is perceived negatively. It is vitally important to overcome the habit of incorrect pronunciation of the ending "ed". It should be pronounced like /d/, /t/ or /id/ depending on the final sound, but it cannot be pronounced as /ed/ in any case, as some respondents used. Thus the key role in this situation is played by a teacher personality, who should be rather tolerant and flexible, proving their statements without offending of the previous teachers and the students themselves.

While teaching pronunciation it is necessary to keep in mind the sound division into vowels and consonants. Some of them resemble Ukrainian ones, still they are not identical. At the lessons we often pay attention to revision of various vowel kinds and consonants, explaining the difference between them.

Not all students can at once understand and learn corresponding rules due to the difference in the psychophysical development. Some students are ready to practically apply the learnt material at once while the others need time and miscellaneous exercises for mastering the learnt information at the proper level. To substantially improve the students' phonetic skills quality a foreign language teacher should teach the students to differentiate between open and closed syllables, consonants for mastering a correct ending pronunciation after them; to constantly train students' pronunciation via repetition of the lexical units in various situations; to regularly revise and train ending pronunciation rules.

The next task was a combination of lexical and grammar knowledge revealed through creativity. Thus creative tasks included writing significant professional issues concerning the learnt material. That implied not only usage of the learnt professional lexis but also application of the theoretical knowledge and personal experience of working with a computer. The results are presented in the table 2.

**Table 2. Future IT-engineers' abilities to perform creative tasks**

Theme of the task	Reproductively				Creatively			
	EG		CG		EG		CG	
	%	AN	%	AN	%	AN	%	AN
1. Internet service	48.1	104	12.8	27	27.8	60	0	0
2. Internet address	57.8	125	18	38	43	93	16.1	34

*Source: Kolisnyk (2018).*

Within the outlined problem we offered creative tasks aimed at revealing students' skills to express their ideas on professional topic: to describe internet services (creative task № 1) and explain the given internet address (creative task № 2).

According to the received results the correct answers made up 48.1 % in EG and 12.8 % in CG. Some respondents interpreted the internet address properly, explaining every constituent meaning in detail. The others did everything superficially with some incomplete words and giving abbreviation. Thus there are a big percentage of incomplete answers of doing the creative task № 1.

As seen from above the second task among the experimental group representatives did 57.8 % of the respondents, in the control group – 18 %.

Considering the obtained results it is necessary to draw more attention to writing and to train term spelling. 27.8 % of EG representatives used their creative approach in explaining an internet address and 0 % in CG (task 1) while 43 % in EG and 16.1 % in CG (task 2). There were students who did not do the creative tasks intentionally. The typical reasons are the following: unwillingness to write with spelling mistakes since they were not sure in the correct spelling; lack of vocabulary in English unlike their ability to speak on the same topic in their native language; being unsure in the response; lack of professional knowledge; and situational reasons.

The final test became the last stage in checking the efficiency of person oriented teaching concerning the students' increase of knowledge and practical skills.

Since the efficiency of any phenomenon is measured by some exponents we offered the research of two aspects in readiness: psychological-pedagogical constituent (motivational and reflection evaluating) and foreign language. The aim was to compare the data of two tests, to provide interviews with the students and, as a result, to define the efficiency of the offered pedagogical technology. Therefore it was important to give a test in order to define knowledge level during the experiment and at the end of it.

If we establish the dynamics of the psychological readiness increase (interest liveliness, desire appearance or its strengthening, a new motivation for studying, persuasion in the right choice of one's profession) we may assert that application of multi level approach in teaching ESP is efficient enough.

Making final test we created a knowledge level dynamics via combination of tests and creative tasks, comprising three constituents of the language learning: lexical, grammatical and phonetic ones.

Since lexis is the basis of the language it is very important to use various tasks for checking this knowledge. The received results are presented in the Table 3.

Considering the obtained data we can make some conclusions. The lexical constituent was worked out successfully enough; as only four tasks out of twenty given ones in EG and five tasks out of twenty ones in CG were accomplished with the result lower than 50 %. The respondents are able to match lexical units, deal with synonyms, find necessary words in the given word line and match antonyms. Forming

derivatives as a creative task makes a certain problem: we have received 37.9 % of correct answers in EG and 20.8 % in CG. Relatively low results are connected with the lack of students' attention to a wide variety of English affixation. Determination and explanation of terms as well as establishing an extra word required not only professional but also foreign language knowledge. The students successfully coped with the professional sentences: 65.7 % of correct answers in EG and 54.9 % in CG. However few students could use their lexical and grammar knowledge while translating professional sentences: 48.1 % of correct answers in EG and 13.7 % in CG.

**Table 3. Future IT-engineers' performing of the lexical tasks within the final check**

Tasks	Correct answers			
	EG		CG	
	%	AN	%	AN
1. Matching and translation of the professional lexical units	100	216	100	216
2. Matching of professional synonyms	82.8	179	63.9	135
3. Grouping of professional synonyms	87	188	63.9	135
4. Matching of professional antonyms	98.1	212	62.1	131
5. Forming derivatives of the given terms	37.9	82	20.8	44
6. Terms definition	96.7	209	88.1	186
7. Stating true or false in the professional sentences	80.1	173	70.1	148
8. Terms explanation	41.2	89	18	38
9. Finding an odd word among the given terms	54.2	117	34.1	72
10. Translation of professional words	65.7	142	54.9	116
11. Translation of professional sentences	48.1	104	13.7	29
12. Completion of the terms	27.8	60	25.1	53

*Source: Kolisnyk (2018).*

The essential grammar themes included: forms of the verb "to be" and "to have", the Present Indefinite Tense, the Continuous Tense, the Present Perfect Tense, active and passive voice, various types of questions, plural of nouns, modal verbs, time signals, infinitive, gerund and participle. Task presentation and the obtained results are given in the Table 4. The successful accomplishment of the grammar tasks by the representatives of the EG is proved by the general level of the done tasks. It was more than 50 % in eight out of twenty offered tasks.

**Table 4. Future IT-engineers' performing grammar tasks within the final check**

Tasks	Correct answers			
	EG		CG	
	%	AN	%	AN
1. Use different forms of the verb "to be" in the professional sentences	50	108	49.7	105
2. Make forms of the verb "to have" in the professional sentences	46.7	101	46.9	99
3. Define the tense and voice of the professional sentences	50	108	30.8	65
4. Use the necessary tense forms on the basis of the professional sentences	56	121	36.9	78
5. Form the past indefinite tense in the professional sentences	73.1	158	58.7	124
6. Make special questions to the professional sentences	46.7	101	18	38
7. Make the plural of the noun terms	76.8	166	64.9	137

8. Make the disjunctive questions to the professional sentences	35.1	76	34.1	72
9. Use the auxiliary verbs “do/does, did” in making professional sentences	69.9	151	62.1	131
10. Add the ending “s/es” in the Present Indefinite tense (3 <sup>rd</sup> person singular) in the professional sentences	82.8	179	80.1	169
11. Transform active voice into passive one in the professional sentences	30.1	65	18	38
12. Transform passive voice into active one in the professional sentences	12.9	28	8	17
13. Use time signals in the professionals sentences	52.8	114	15.2	32
14. Form a participle I of the professional verbs	64.8	140	49.7	105

Source: Kolisnyk (2018).

The CG students reached this only in four tasks. The table results show that the students have learnt forms of the auxiliary verbs, the Past Indefinite Tense, plural of nouns, special and disjunctive questions etc. The most difficult themes turned to be Passive voice (12.9 % of correct answers in EG and 8 % in CG) and time signals (52.8 % of correct answers in EG and 15.2 % in CG).

The phonetic constituent of the final test included tasks in designating “silent” letters, defining pronunciation of the letters “c” and “g”, spelling of endings “s/es” and “ed”, pronunciation of similar letter combinations etc. The data are given in the Table 5.

**Table 5. Future IT-engineers’ performing phonetic tasks within the final check**

Tasks	Correct answers			
	EG		CG	
	%	AN	EG	AN
1. Underline “silent” letters in the terms	77.8	168	65.9	139
2. Define the pronunciation of the letters “c” and “g” in the professional lexical units	82.8	179	67.8	143
3. Define the pronunciation of the ending “s/es” in the plural of term nouns	33.8	73	21.8	46
4. Define the pronunciation of the ending “ed” in the professional verbs	47.2	102	24.2	51
5. Choose homonyms to the given terms	76.8	166	53.1	112
6. Complete the homonym terms	62	134	61.1	129
7. Insert letters “ec/ea” in the professional lexical units	87	188	84.8	179
8. Insert letters “or/aw” in the professional lexical units	87	188	84.8	179
9. Insert letters “gh/f” in the professional lexical units	87	188	82.9	175

Source: Kolisnyk (2018).

As we see from the received data the exponents of the experimental group in every task exceed the ones of the control group. This can be explained by the common matter for performing such tasks by the students of the explored group as compared with the peers from the control group. The latter group was taught by different teachers who did not stick to the same teaching techniques. Besides, lexical units with “silent” letters and homonyms are mainly not considered at the lessons due to the students’ insufficient training level.

We use these aspects to activate a cognitive interest and attract attention to a foreign language research as a separate object for studying. The obtained results prove that in general the students know words with

“silent” letters (77.8 % of correct answers in EG and 65.9 % in CG) and have their skills to properly pronounce letters “c” and “g” (82.8 % in EG and 67.8 % in CG). The easiest task turned to be the spelling of similar letter combinations: from 87 % in EG up to 82.9 % respondents in CG successfully coped with this task.

The initial stage task of learning English turned to be more complicated for the students. It required some phonetic knowledge of the ending “s/es” pronunciation in plural nouns. Only 54.2 % in EG and 21.8 % in CG managed to do it.

We have deeply analyzed the obtained results of the final test. Thus it is possible to conclude that in spite of some available learning problems there were some positive changes in studying and psychological aspects of the future IT engineers’ academic activity. It is remarkable that these positive changes happened due to the application of person oriented approach towards teaching English. Some of them are displayed in a considerable part of correct answers, the others are revealed via percentage of different tasks accomplishment. The students became more confident. Evidently that there are still a number of problem aspects in spelling, ending pronunciation and grammar which require additional consideration. However we observe the general advance in the group emotional sphere, positive set on activity and interactive cooperation between students and teachers.

To correct existing knowledge gaps it is necessary to wider use oral answers; to refer to students’ professional knowledge and their own life experience rather than learnt texts; to pay attention to spelling that is very important for mechanical memorizing of lexis.

A teacher should analyze the available facts and correct their teaching activity for improvement of the situation. Therefore it is quite rational to revise the themes which are difficult for certain students. We also can recommend a persistent academic activity aimed at recurrent reference to the learnt material. It will contribute to better knowledge application and skill formation of the received knowledge.

Of course in the context of person oriented teaching it is not correct to support exceptionally on the obligation of the students’ deep knowledge. The scientist S. Safarian gives the following grounds for this.

Firstly, person oriented teaching should promote a person’s intellectual development via involving their individual and personal experience to cognitive activity for a human’s self-actualization and potential realization. Secondly, in such teaching we evaluate not only knowledge absorbing (though there is a grade) but also a young person’s ability to demonstrate oneself and realize one’s potential possibilities i.e. we deal with a personality’s individual increase (Safarian, 2012).

After implementation of the person oriented teaching we fixed establishment of psychological stability and essential liveliness in cognitive activity among the students majoring in IT. There appeared some positive advancement. The most important among them are the following:

- absence of fear in doing a complicated task due to the possibility to choose the easier variant, even changing the task level while doing it;
- appearance of interest among the low level students because of the real opportunity to cope with the task;
- absence of subjective aspects in evaluation, because it is the student who chooses the variant that is connected with the maximum point for doing a task;
- transparency of points accumulation during the whole studying period;
- possibility of studying increase when the task choice is possible to be changed in correlation with the knowledge of a particular theme;
- activity democracy, when a student makes a choice, not a teacher, which always contributes to positive emotions;
- gaining more confidence while answering as compared with the initial stage;
- increase of the low level students’ self-esteem due to equal possibilities;
- decrease in responsibility for the unlearnt complicated material (on the basis of three possible levels principle);



- decrease of the non-passed material since worse preparation does not mean lack of points, it only means their lower number;
- directing one's energy to doing more complicated tasks with higher grading, i.e. independent striving to raise personal level;
- appearance of the healthy competition concerning task difficulty level.

In general, liberalization, equality and democracy in teaching are important factors in forming a complete personality. Thus we support the statement made by the scholar L. Sheliuk, who told that “democracy in higher education is not the final stage, but it is simultaneously continuous process and purpose, which should be constantly longed for.

It will truly efficient only when teachers as well as students will constantly look after it and defend it, will take it as an embodiment of civil rights and freedom” (Sheliuk, 2014).

We admit that the students' foreign language readiness to learning ESP has got the distinct features of improvement. It is proved by the following studying advancements in the experimental group:

- awareness in the reality to learn any grammar material which can be learnt at least at the simplest level;
- fixing on the lexical constituent of one's level;
- learning some synonyms, homonyms and similar lexical units in different variations;
- more demonstration of the foreign language communication in the educational process as compared with the first studying stage;
- greater frequency of the foreign language usage while using terms;
- greater level of using derivatives and learning some affixes meanings;
- better pronunciation in speaking general English words;
- clarification and learning correct pronunciation of terms.

### **CONCLUSION AND PROSPECTS OF THE FURTHER RESEARCH**

Since after application person oriented teaching ESP on the basis of multi-level approach we fix improvements in the psychological and foreign language aspects of the students' readiness its efficiency is obvious. Thus it is clear that this educational technology should be used in teaching ESP for various fields of study as this is the vital necessity for professional training and formation a mature personality of a future IT-engineer. Further research may be connected with other specialties or deeper aspects of the students' readiness to use their knowledge in the professional activity.

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## VECTORS OF FORMATION OF RESEARCH COMPETENCE OF FUTURE SPECIALISTS IN THE PROCESS OF THEIR SCIENTIFIC AND PRACTICAL TRAINING

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### ABSTRACT

The section of the monograph reveals the concept of “scientific and research activities of higher education students”, its purpose and tasks. The “Regulations on the Organization of Scientific, Scientific and Technical Activities in Higher Education Institutions of III and IV Levels of Accreditation” and “Strategy for the development of higher education in Ukraine for 2021-2031” were analyzed. The strengths and weaknesses, opportunities and threats of the external environment that may affect the further development of higher education in Ukraine are identified. Also, the section of the monograph is devoted to the theoretical substantiation of the process of formation of research competence future doctors of philosophy in the process of doctoral training. The essence of the notions of key categories of research “competence” and “Research competence” has been analyzed. Based on the theoretical analysis of scientific research, the components of research competence of future doctors of philosophy have been identified and characterized; they are the following: cognitive, motivational-value, operational-activity, reflexive. The methodological approaches and principles of formation of research competence of future doctors of philosophy have been clarified. The leading methods, forms and means of formation of research competence of future doctors of philosophy in the process of teaching the discipline “Academic Writing” have been singled out and characterized.

**Keywords:** scientific research work, research competence, future doctors of philosophy, formation of research competence, doctoral training.

### INTRODUCTION

At the current stage of transformation of the national education system, much attention is paid to training doctoral students who are qualified to obtain a scientific degree is evaluated by the ability to innovatively solve scientific tasks that is a future potential for research. Doctoral programs are considered crucial for the training of a new generation researchers in the field of higher education and scientific research in one the European scientific space.

At the national level, the domestic system of higher education regulated by the Law of Ukraine “On Higher Education” and in accordance with in 2014, he began training for a doctor of philosophy, which corresponds to the third educational and scientific level of training of specialists from higher education. According to the law, the doctor of philosophy is educational and at the same time the first scientific degree obtained at the third level of higher education education based on a master’s degree.

Therefore, the degree of doctor of philosophy is awarded by a specialized by the academic council of a higher education institution or scientific institution in as a result of the successful completion of the relevant higher education by the applicant educational and scientific program and public defense of the dissertation at specialized academic council (Law “On Higher Education”, 2014). According to the National Framework of Qualifications (Decree “About approval of the National Framework of Qualifications”, 2011) and the law of Ukraine “On Education” (Law “On Education”, 2017) as a result of study at the specified level is the acquisition by specialists of theoretical knowledge, skills, skills for conducting own scientific research, which will be have scientific novelty, theoretical and practical significance.

Prospective PhD candidates must demonstrate their ability to perform original and independent research within a scientific discipline or interdisciplinary collaboration. Important qualities of the doctor philosophy is individuality, originality, independence, autonomy and responsibility during the implementation of complex

projects, work in a team, communication skills. At the university level educational disciplines, courses, modules are being introduced solve complex problems in the field of professional or research activities that contribute to deep re-awareness existing and creating new holistic knowledge or professional practice.

The subject of our research is the issue of formation research competence of future doctors of philosophy with specialty 011 Educational, pedagogical sciences in the doctoral process training on the example of academic discipline “Academic Writing”. Note that the research activity in within the specified discipline is one of the most important forms educational process, promotes the development of individuality, creative abilities, critical thinking, involves self-development and self-improvement of the individual.

### **ANALYSIS OF THE LATEST RESEARCH**

Theoretical analysis of scientific sources from the specified problem allows to single out certain directions of it research: highlighting the essence of the competence approach to professional training of future specialists (I. Beh, N. Bibik, O. Bondarevska, O. Gluzman, I. Zimnyaya, O. Ovcharuk, O. Pometun, O. Onoprienko, A. Khutorskyi, V. Shadrikov, etc.); study theoretical foundations of the organization of scientific and research activities students (B. Andrievsky, M. Knyazyan, O. Krushelnytska, A. Moseychuk, A. Sbruyeva, V. Slastyonin, I. Soloshich, R. Shishka, A. J. Head, C. Thompson, D. J. Grimes, H. Stuart, J. Griffiths, etc.); formation of research skills depending on the methodology and organization of educational and cognitive and research activities (O. Abdulina, H. Artemchuk, I. Drach, M. Knyazyan, L. Kozak, V. Lytovchenko, N. Moskalyuk, E. Spitsin, etc.); elucidation of the features of future research work specialists Ya. Bolyubash, N. Volkova, I. Zyazyun, M. Knyazyan, V. Kremen, S. Lukashenko, L. Sultanova, O. Pehota, M. Falko.

### **METHODS**

To realize the purpose of the research a complex of interrelated methods was used, in particular, theoretical: analysis of scientific literature, synthesis, comparison, generalization of the practical experience of forming research competence; terminological analysis to determine the essence and the content of the key definitions of the study; structural and logical analysis to outline the substantive and procedural principles of formation research competence of future PhDs in the process doctoral training.

The theoretical substantiation of the process formation of research competence of future doctors of philosophy in the specialty 011 Educational, pedagogical sciences in progress doctoral training on the example of the educational discipline “Academic Writing”.

### **RESULTS**

The investigated problem is not new. The task of forming research skills of higher education students is outlined in a number of legislative acts. In accordance with the Decree of the Presidium of the Academy of Sciences of Ukraine “On the development of science and transformation of society: a concept for Ukraine”, the leading goal of the scientific, scientific and technical and innovative policy of the education system is: ensuring the training of specialists, scientific and scientific and pedagogical staff at the level of global qualification requirements, effective use of its educational, scientific, technical and innovative potential for the development of the economy and solving social problems (On the development of science and the transformation of society, 1992).

Research work of students of higher education is the most effective method of training qualitatively new specialists in higher education. It maximally develops creative thinking, individual abilities, and research skills of higher education students, allows training of proactive specialists, develops scientific intuition, depth of thinking, creative approach to the perception of knowledge and practical application in solving certain tasks (Shinkaruk, 1986).

The peculiarity of the process of high-quality training of students of higher education lies in its orientation towards specific professionalization, accordingly, scientific research work is one of the main

components of the professional characteristics of a future specialist, expansion of his opportunities for self-realization, mobilization of personal potential, provision of future qualified specialists not only with knowledge, but also with proper place in the socio-economic system - science, production, entrepreneurship and other areas.

The scientific, scientific and technical activity of institutions of higher education subordinated to the Ministry of Education and Science of Ukraine is regulated by the “Regulations on the organization of scientific, scientific and technical activity in higher educational institutions of III and IV levels of accreditation” (Regulations on the organization of scientific, scientific and technical activities, 2006), according to which the main goal of scientific and the scientific and technical activity of higher education institutions is the acquisition and use of new scientific knowledge with the aim of creating socially useful scientific results, ensuring high-quality training of specialists for the relevant branches of the economy, highly qualified scientific and scientific-pedagogical personnel; solving complex problems in the field of scientific and technological development; implementation and use of scientific and scientific-practical results in Ukraine and on the world market.

A profound feature of the modern educational policy of Ukraine is that it organically combines political, socio-economic and actually educational aspects. With such an approach to solving scientific and educational problems, there is an opportunity to overcome departmental and branch barriers and return to education its natural essence as a sphere of integration and realization of general educational interests and priorities of our state.

The modern stage of the transformation of the higher education system is marked by deep penetration into the social sphere and economic activity, access to the global markets of labor, services, goods and capital. Under such conditions, effective reform of the higher education system is impossible at the expense of only the administrative methods of the education system itself. Consolidated efforts of power structures at all levels, employers, and the population are necessary, taking into account the state of the economy and social needs.

The problems of the development of higher education are caused not only by economic and political instability in society, the growing gap between the constitutional guarantees of obtaining an accessible and free education and its real state provision, but also by the incompleteness of the reform of almost all sectors of the economy; insufficient budget funding and the specifics of personnel training for certain branches of the national economy, etc. Therefore, the role of the state in solving these problems is important and requires more effective use of the existing and development of the latest tools of state regulation of the system of training specialists (Leshchenko, Bondar, Kyrstia, 2022).

In accordance with the needs of the development of the economy and society, higher education, as well as scientific research activities, should ensure the training of a specialist for the relevant field of the national economy, capable of adaptation, creative and critical thinking, generating new ideas and actions in a new situation. That is, higher education is assigned the role of a key factor in creating prerequisites for ensuring the competitiveness of the national economy. For this, higher education itself must become attractive and competitive not only on the national, but also on the world market of educational services.

The concept of “scientific and research activity of students of higher education” includes two interrelated elements:

- teaching students of higher education elements of research activity, organization and methods of scientific creativity;
- scientific research carried out by students of higher education under the guidance of teachers.

It can be argued that the research activity of higher education students as one of the forms of cognitive and creative activity ensures the formation of intellectual activity, which is a component of the professional competence of the future specialist. The scientific and research work of higher education students stems primarily from the educational tasks of the university and contributes to the preparation of the creative personality of the teacher of the 21st century (Kuz, 2006).

The purpose of the organization of scientific research activities of students of higher education (Drach, 2005):

- providing the maximum opportunity for the development of personality and professional qualities, creative individuality of the future specialist;
- development of creative abilities and activation of mental activity;
- formation of the need for continuous independent replenishment of knowledge;
- acquisition of a deep system of knowledge as a sign of strength.

The task can be reduced to the following two:

- forecasting or predicting everything that creates the best conditions for deep and comprehensive assimilation of this or that system of scientific knowledge;
- forecasting scientific activity or predicting the gradual transition of higher education students from elementary levels and forms of knowledge to more complex and global ones.

The goal of the development of scientific research activities of a modern university is: optimization of the inextricable connection of advanced teaching methods and scientific research to ensure full participation of the university in the Bologna Process; integration of the university into the system of European science; strengthening the scientific potential of the university; involvement of talented young people in scientific research; ensuring the anticipatory development of science at the university, arising from the needs of training future specialists; ensuring the implementation of theoretical developments at the world level and the effectiveness of applied research by university employees; ensuring the focus of scientific and innovative activities at the university on priority areas of science and technology for the state; ensuring the effective use of the scientific potential of the university to solve the problems of social and economic development of Ukraine.

Research work in institutions of higher education, their connection with scientific institutions is one of the biggest problems recently. The unsatisfactory state of research work affects the activity of those who have obtained higher scientific, educational and scientific levels, who should constitute the main personnel resource of scientific research.

From 2012 to 2022, the number of higher education institutions training postgraduate students in Ukraine decreased by 9,3% (226 institutions), but the number of institutions training doctoral students increased by 4,7% (168 institutions, the maximum number in 2015 year consisted of 177 institutions). To a certain extent, the instability of the number of institutions training postgraduates and doctoral students, as well as having specialized councils, is connected with the introduced changes in the procedure for awarding scientific degrees. Ukrainian youth are in no hurry to devote themselves to science – from 2012 to 2022, the number of postgraduate students in Ukraine decreased by 19,5% (23 thousand people), the number of students enrolled in 2022 decreased by 22,8% compared to 2012 (6,780 people). The total number of doctoral students decreased by 24,2% (937 people), enrolled students – by 9,7% (435 people) (Strategy for the development, 2020).

Based on the analysis of the dynamics of the development of higher education and scientific and research activities in Ukraine for 2014-2020, taking into account the opinion of experts of working subgroups on strategy development and taking into account global trends in the development of higher education, the following strengths and weaknesses, opportunities and threats were determined external environment that can affect the further development of higher education in Ukraine (Table 1). The analysis of the problems and advantages of the system of higher education and research activity of Ukraine, together with the generalization of the directions of the development of higher education in the world, the priorities of the European area of higher education, made it possible to formulate the priority principles of the development of higher education in Ukraine, which will determine the conceptual model of higher education, as follows: university autonomy and institutional capacity of higher education institutions; transparency and openness of management; collegiality and involvement, shared responsibility; expediency; partnership; rejection of corruption; academic integrity; academic freedom; professionalism; focus on the highest scientific achieve-

ments; focus on achieving the highest quality of education; orientation to the current and prospective priorities of society and the national economy; stability.

**Table 1 Analysis of the development of higher education and research activities in Ukraine**

<b>Strengths</b>	<b>Opportunities</b>
<ul style="list-style-type: none"> <li>- an extensive network of higher education institutions, focused on the provision of educational services on a mass scale, a diversified educational offer;</li> <li>- availability of world-class universities;</li> <li>- a sufficient number of highly qualified scientific and pedagogical workers capable of ensuring dynamic innovative development of the higher education system;</li> <li>- a number of scientific schools producing world-class scientific results;</li> <li>- continuity of teaching methods and research traditions along with the implementation of the best world experience;</li> <li>- transparent procedures for access to higher education, which have gained public support;</li> <li>- high quality of training in certain areas, which is confirmed by the demand for graduates on the domestic and foreign markets of highly qualified specialists.</li> </ul>	<ul style="list-style-type: none"> <li>- geopolitical location of Ukraine in the center of Europe, which is the basis of successful internationalization of higher education and science;</li> <li>- the global trend towards growing demand for education abroad, powerful markets for educational services in Asian countries;</li> <li>- sectoral transformation of the world and national economy;</li> <li>- openness and availability of modern educational content;</li> <li>- the involvement of Ukraine in the processes of European and Euro-Atlantic integration, the European educational space;</li> <li>- development of the Higher Education Development Strategy in the context of the Strategy of Social and Economic Development of Ukraine;</li> <li>- scientific potential of the national academies of sciences of Ukraine, synergy from the interaction of university and academic science;</li> <li>- potential interest of business structures and associations in cooperation with academic centers and universities;</li> <li>- rapid development of the IT industry and digitization.</li> </ul>
<b>Weaknesses</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>- imperfect regulatory and legal framework for the functioning of the higher education system;</li> <li>- weak and asymmetric integration into the world educational and scientific space;</li> <li>- presence of a significant number of non-competitive institutions of higher education;</li> <li>- low level of involvement of participants in the educational process in scientific and innovative activities;</li> <li>- imperfect system of allocation of budgetary resources between institutions of higher education;</li> <li>- low level of readiness of the infrastructure of higher education institutions for the training of persons with special educational needs;</li> <li>- weak practical training of specialists in institutions of higher education;</li> <li>- lack of forecasting of the needs of the country's</li> </ul>	<ul style="list-style-type: none"> <li>- loss of the opportunity to obtain new breakthrough results by scientific schools of higher educational institutions;</li> <li>- the attractiveness of European education for potential applicants in view of the possibility of obtaining competitive knowledge on the modern market and further realization of professional ambitions outside of Ukraine;</li> <li>- development of distance learning systems of foreign higher education institutions, which have a higher rating than Ukrainian higher education institutions;</li> <li>- inconsistency of the training level of a significant part of the entrants with the requirements necessary for successful mastering of educational programs of higher education;</li> <li>- negative impact of the COVID 19 pandemic and</li> </ul>

economy in specialists with appropriate qualifications.	the war in Ukraine – possible demassification, narrowing of foreign markets for educational services.
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The strategy implementation mechanism provides for the determination of directions for the use of all types of resources (organizational, financial, informational, etc.) under the condition of maximum effectiveness of their use to achieve the strategic vision (Strategy for the development, 2020).

Organizational support consists of:

- a plan of actions for the implementation of the Strategy, which includes the specification of the tasks of the Strategy to the level of individual measures, indicating the terms of their implementation, reporting forms, volumes and sources of funding, indicators of achieving the expected result. The action plan is developed for a short-term perspective (1-2 years), after the end of the planned period, the results are evaluated and the Strategy implementation action plan is drawn up for the next 1-2 years. The order of implementation of measures is established in a logical sequence both according to individual operational goals and tasks, and taking into account other goals (tasks), as well as the achieved progress according to the goals;

- coordination with the Strategy of socio-economic development, the Strategy of scientific and technical development, priorities of scientific and scientific and technical activities, when they are adopted;

- adjustment (updating) in connection with the adoption of sectoral development strategies in terms of providing personnel training in certain fields of knowledge;

- coverage of the strategy implementation process in mass media, including digital, accessible to the entire educational community and society.

Institutional support for the implementation of the Strategy provides for:

- clear distribution of powers between all participants in accordance with their competence, normalization of their interaction;

- establishment of effective cooperation between participants in the implementation of the Strategy through the conclusion of agreements, contracts, implementation of joint activities, projects, etc.;

- prevention (elimination) of conflict of interests;

- prevention of corruption.

Tool support includes:

- digitization of the processes of programming, planning, support, coverage and monitoring of Strategy implementation;

- public-private partnership in the implementation of individual educational, scientific and educational projects and start-up projects, in particular, dual education;

- bilateral and multilateral agreements on the provision of educational services, mutual recognition of education levels, qualifications, etc.

Financial support for implementation:

Strategies are formed from:

- the funds of the State Budget of Ukraine, in particular, the funds of the Centers for Disease Control and Prevention (managers of funds), on the order of which specialists are trained by the system of higher education of Ukraine, scientific and scientific and technical developments;

- funds from local budgets;

- funds from international organizations, grants, funds from foreign investors, attracted under the terms of co-financing of educational, scientific, educational and industrial projects;

- funds of business entities involved in the framework of public-private partnership;

- funds of individuals and legal entities (residents and non-residents) received as payment for education;



- funds of financial organizations, attracted under the terms of lending, in particular, preferential, to pay for education; funds received from the realization of intellectual property rights;
- funds received from the implementation of additional economic activities of the institutions of higher education; charitable contributions;
- funds from other sources not prohibited by law.

The scientific and methodological support is intended to substantiate the plans for the implementation of the Strategy and to solve its individual tasks.

Scientific support and methodical support for the development and implementation of the Strategy are carried out by scientific institutions of the Ministry of Education and Science and the National Academies of Sciences. It includes:

- scientific substantiation, assessment and forecast of the effectiveness of individual measures within the framework of the implementation of the Strategy;
- development of methodology and forecasting of labor market needs;
- research, analysis and monitoring of problems of world, national and regional systems of higher education, their interaction with each other and with systems of secondary and vocational pre-higher education;
- analysis of the current results of the implementation of the Strategy;
- constant support of the implementation of the Strategy, development of proposals and recommendations for updating the goals and objectives of the Strategy.

At the European level in February 2005 in Salzburg The European University Association approved the definition and description doctoral education, which became known as the Salzburg Declaration. Report includes the following important statement, in particular, the main one a component of doctoral education is the advancement of knowledge through original research. At the same time, it is recognized that training doctoral students should increasingly meet the needs of the market employment, which is broader than academia (EUA, 2005).

Later in 2007, the European Association of Universities was a special program was adopted in which the strategies of the organization were developed and conducting scientific research in universities that will contribute stimulating cooperation and unification of scientists from different countries scientific potential to create a single European scientific space (European University Association, 2007). In accordance the key role of coordinators to the development strategy of a united Europe of scientific research belongs to the European Research Council and the European Science Foundation (European Research Area, 2007).

The following provisions are a priority for our research: development of scientific research as a component of higher education, simultaneous formation of the European space of education and European research spaces as the basis of a progressive society; reorganization of higher education and renewal of educational programs for provision of innovative activities; increasing the competitiveness of European research institutes thanks to their involvement in joint work as a result of the integration of scientific resources the European Union; combination of traditional methods and forms of education in higher education school with the use of modern ones in the organization of the educational process information, computer and pedagogical technologies.

At the European level, the qualification criteria for the future doctors of philosophy are determined by the European qualification system (EQS), in which it is declared that the learning result is acquired innovative, autonomous and integral professional integrity, development of new ideas in the context of research and science.

*Analysis of the essence of key research categories “competence” and “research competence”.*

As part of our research, we consider it appropriate to consider interpretation of the essence of the concepts “competence” and “research competence”. Yes, there is a large amount in the scientific and pedagogical literature number of definitions of the essence of the concept of “competence”. Mentioned the phenomenon has become the subject of domestic and foreign studies researchers, in particular, L. Avdeeva,

A. Andreev, E. Zeer, G. Kodjaspirova, A. Kodjaspirov, I. Kubenko, O. Ovcharuk, G. Selevko, E. Edmund, E. Short and others.

The essence of the concept is in the Law of Ukraine “On Higher Education”. “competence” is considered as a dynamic combination of knowledge and skills and skills, ways of thinking, professional, worldview and civic qualities, moral and ethical values that determine and the ability to successfully carry out professional and educational activities the result of studies at a certain level of higher education (Law of Ukraine “About higher education”. With changes and additions, 2014).

In the “National Educational Glossary: Higher Education” definition the concept of “competence” is interpreted as a combination of knowledge, skills, values, other professional qualities describing the results study according to the educational program (Babyn, Bolyubash, Garmash, 2011).

However, in the studies of the Commission of the Council of Europe, the essence of the concept “Competence” is defined as the ability, qualifications, knowledge, or basic knowledge that is key in professional activity and is used in new situations (Key Competencies, 2002).

Specialists of the Department of Learning Standards, Achievement and Education (IBSTPI) believe that competence is the ability of an individual to perform tasks at a highly skilled level in a certain way activity, and consists of knowledge, abilities and skills (Spector, Michael-de la Teja Ileana, 2012).

Researcher T. V. Borovikova notes that “competence is formed in activity and is always revealed under the condition of value attitude to activity, personal interest”. According to the author, “competence consists of the following components: knowledge, skills (qualifications), value attitude to activity, personal qualities, etc such as professional mobility, analytical skills, communication skills, the ability to work in a team” (Borovikova, 2010).

Thus, we can state the fact that theoretical analysis of the essence of the term “competence” allows apply its definition to the performed activity, qualification, type of professional training and comes down to the amount of knowledge, abilities and skills acquired in the educational process, a set of personal ones characteristics with the presence of certain personal qualities.

According to the logic of our scientific research characterize the essence of the concept of “research competence”. Domestic and foreign researchers (S. Abakumova, L. Abdulova, S. Vitvytska, M. Golovan, L. Kazarina, A. Mityaeva, E. Mykhailivska, S. Sysoeva, A. Khutorskyi, V. Yatsenko and others) pay considerable attention examination of the specified educational phenomenon.

According to A. Khutorskyi, research competence is defined as a person’s possession of the relevant research competence, under which knowledge should be understood as a result cognitive activity of a person in a certain field of science, methods, research methods that he must master in order to carry out research activity, as well as the motivation and position of the researcher, his value orientations (Khutorskyi, 2007).

Scientists S. O. Sysoeva, L. V. Kozak interpret the research competence as an integrated personal and professional quality specialist, which reflects the motivation for scientific research, the level of mastery of the methodology of pedagogical research, personally significant qualities of the researcher, in particular, such as innovative thinking, the ability for creative and innovative activity (Sysoeva, 2016). The correct opinion of researcher T.V. Borovikova regarding interrelationship of general cultural competences and professional ones fill research competence with content. Accented attention that general cultural competences are invariant for any professional activities, and professional ones change depending on the direction training and include readiness for a specific professional activities with a research orientation (Borovikova, 2010).

We support and rely on definitions “research competence”, given by N. Edwards, S. Osipova and others who pay attention to the transformative character research competence and present it as integrated personal quality. This is expressed as willingness and ability on your own to master and obtain systems of new knowledge as a result transfer of the semantic context of activity, from functional to transforming, on the basis of already existing knowledge, abilities, skills and methods of activity (Edwards, Osypova, 2011).

Based on the analysis and comparison of scientific research on the above problems, we will try to summarize scientific approaches to the definition the essence of the concept “Research competence” (Table 2).

**Table 2. Analysis of scientific approaches to defining the essence of the concept “Research competence”**

<b>Scientific approach</b>	<b>The author of the approach</b>	<b>Essential characteristics of the concept “Research competence”</b>
Competency approach	M. Golovan, I. Zimnyaya, A. Karpov, V. Koval, O. Ovcharuk, O. Pometun, O. Savchenko, V. Slastyonin, M. Stepko, Yu. Tatur	- is an integral characteristic personalities; transformative nature; - a personal quality expressed in readiness and ability independently learn and receive systems new knowledge as a result of transfer semantic context of activity from functional to transformative
Process technology approach	A. Khutorskyi, M. Arkhipova	- possession of a suitable person research competence, which is the result of cognitive activity of a person in a certain field of science, methods, research methods, which it is must possess in order to exercise research activity; motivation and position of the researcher, his values orientation
Functionally active approach	A. Markova, V. Shadrykov, I. Nikanorov	- adaptability to many conditions role research activity; - the ability to project it and carry out; - ability to personal and professional self-realization
System approach	L. Golub, V. Lazarev, T. Resin	- is an integral component of the general and professional education; - is a characteristic of the teacher, which means possession of skills and means research activity at the level technologies for the purpose of finding knowledge for solving educational problems, organization of the educational process
Valuable activity approach	T. Borovikova	- personal characteristics researcher, which is formed in the activity and always appears under conditions value relation to activity, personal interest
Knowledge-operational approach	V. Vvedenskyi, M. Danilov, E. Zeyer, I. Zyazyun, V. Kremen, V. Lugovyi, E. Shashenkova	- a set of necessary knowledge and skills for conducting research activities; - possession of personality academically and almost professionally oriented significant information, complexes research and reflective actions
Research approach	D. Elkonin, A. Karpov, I. Kon, B. Lipskyi, H. Trosheva	- provides a transition to new content education; - provides reorientation of education to on the basis of a holistic culture; - promotes humanization and humanization higher education

Thus, the theoretical analysis of scientific approaches allows generalize the definition of the essence of the category “Research competence” as an integral characteristic of the individual, which consists in the readiness and ability to learn and receive independently systems of new knowledge as a result of the transfer of the semantic context activities from functional to transformative, based on available knowledge, abilities, skills and methods of activity.

Given the variety of scientific approaches to the definition essence of the concept of “Research competence” becomes possible highlighting its specific characteristics: metasubjectivity (acquired experience of research activity in the process of learning), integrability (availability of personal qualities, research, communication skills, etc.), innovativeness (application of creative abilities, creative thinking, innovative methods and forms), prognostication (prediction of the educational result based on analytical thinking, perception and the ability to distinguish the main thing), individuality (availability personal qualities, research experience).

Therefore, based on the analysis of various scientific approaches regarding definition of the essence of the category “Research competence” is possible to find out the role of research competence in the doctoral process training, namely, promoting motivation and activation effective use of the acquired experience of research activity in professional field (search, analysis, synthesis, comparison, generalization received information from various scientific sources on the topic of scientific research, study of foreign sources, participation in international conferences and publication of own research materials for border, compliance with norms of academic integrity, which will ensure entry into the European scientific community); effective mastery methods of scientific knowledge in the process of research activity for solving creative tasks in the process of studying an academic discipline “Academic Writing”; ensuring self-realization future doctors of philosophy in order to reveal their scientific and creative potential.

It is worth noting that the foreign scientist M. Haley, taking into account the research approach, proposed the following models of combination teaching and research, namely research-based learning (Research-based learning); research-oriented learning (Research-oriented learning); learning based on informing about research (Research-led learning); learning based on research-tutored learning (Healey, 2005).

In the context of our research, we considered and combined the specified models in the educational process of teaching the course “Academic Writing”. Formation of research competence of future doctoral students involves familiarization with values, practical and ethical norms of the chosen field of knowledge, development of critical and analytical thinking; mastery methods and techniques of research and their evaluation results in both research and professional activities.

According to the logic of scientific research, it is necessary to find out structure of research competence of future doctors philosophy According to A. Karpov, under structural components research competence is understood as readiness for independent solution of the task within the scope of the research activity, which leads to achieve a specific result in accordance with the requirements professional standard (Karpov, 2011).

*Characteristics of the structural components of the research competence*

There are various scientific approaches in scientific and pedagogical literature domestic and foreign scientists regarding the definition of structural components of research competence (Hladyuk, 2006), (Zolochevska, 2009), (Luhovska, 2013), (Knyazyan, 2006), (Mykhaskova, 2004), (Shapran, 2012), (Shestopalyuk, 2010).

As a result of the analysis, synthesis, comparison, scientific research, we will present the generalized ones structural components of research competence (Table 3).

**Table 3. Structural components of research competence**

Author	Name of structural component
T. Hladyuk	is motivational and valuable, cognitive, operational, reflective
M. Zolochevska	functional-reflexive, motivational-value, content-practical, functional-reflexive

E. Luhovska	cognitive, activity, motivational, reflexive
M. Knyazyan	motivational and valuable, informational and substantive, activity-behavioral, evaluative-reflective
M. Mykhaskova	is value oriented, cognitive, and practical
Yu. Shapran	value-motivational, cognitive-active, personally reflective
O. Shestopalyuk	value-motivational, cognitive, personal, behavioral

Thus, on the basis of theoretical analysis, we highlight structural components of future research competence doctors of philosophy in the process of studying an academic discipline “Academic Writing”: cognitive, motivational, operational, reflective (Table 4).

**Table 4. Structural components of future research competence doctors of philosophy**

<b>The name of the structural component</b>	<b>Characteristics of the structural component research competence</b>
1. Cognitive component	Reflects the knowledge system that enables the ability doctoral students to independently conduct research search, systematize, analyze, necessary information and master the methodological apparatus research
2. Motivational value component	Includes motives, goals, the need for scientific research, self-improvement, self-development, positive attitude to scientific research activity, internal readiness before its implementation, establishment of its significance and importance in professional activity
3. Operational component	Presupposes the readiness of the individual to apply acquired knowledge, skills and abilities in their own practical activity in specific conditions in accordance with the norms and technologies of scientific creativity
4. Reflective component	Taking into account the ability to reflect one’s own analytical activity involving introspection and self-assessment of one’s activity and its results, awareness and evaluation of the degree of implementation planned activity goals

Let’s analyze the content of each of these component. Cognitive component of research competence manifested through the ability of future PhD independently organize and conduct scientific research, systematize, analyze the necessary information; have methodological apparatus of scientific research; ability to use in practice regularities, scientific principles activities, interdisciplinary knowledge to solve concrete research tasks; consciously elaborate and apply the received scientific information from various foreign countries sources. At the same time, doctoral students demonstrate such personal qualities, as motivation, independence, initiative, awareness, research activity, creativity to solve specific problems research tasks.

The key element of the cognitive component is formation scientific thinking that reproduces the specificity of the object of knowledge and focus of mental operations on solving problems, definition research goals, hypotheses based on theoretical or experimental research and necessarily contains new ideas; development of research methodology; analysis of the obtained results; formulation of conclusions.

So, the cognitive component of research competence includes knowledge of an integrative nature, namely, professional, scientific research and methodological. The named component provides acquisition of professional knowledge and experience by doctoral students, development critical thinking, organizational, communication skills, the ability to cooperate in a team (Luchaninova, Koval, Deforz, Nakonechna & Golovnia, 2019).

The next motivational and value component of the research competence of future doctors of philosophy includes motives, goals, need in research, self-improvement, self-development.

In her scientific works, researcher O. Zuyeva analyzes the motive as internal motivation of the individual to a certain type of activity, related to the satisfaction of defined needs. She believes that need, as an internal factor of personal activity stimulates showing interest in receiving education and the process self-improvement (Zuyeva, 2004).

Researcher L. Sultanova motivational and value component considers as a process of formation of such motives as positive attitude to research activity, internal readiness for its implementation, establishing its significance and importance in professional training (Sultanova, 2004). According to O. Prokhorova, the specified component is motivational and valuable, as it reflects, first of all, value orientations personality, striving for moral self-improvement, positive attitude towards various types of socially significant activity. Components components are professional value orientations, sustainable motives and settings for professional self-improvement, worldview formation and motivation, the value of achieving the truth in the scientific process research, activity nature of research, communication in research environment, research productivity activity (Prokhorova, 2011).

The leading basis of the motivational and value component is, with on the one hand, deep awareness and understanding of the future by doctors of philosophy of the importance of knowledge about research activity, the formation of a positive motive for its implementation, and another, the presence of a personal need and interest in the occupation research activity and its implementation, the result of which is an educational scientific product. The analysis of scientific and pedagogical literature makes it possible to distinguish the main motives, namely, internal (permanent interest in the process research, the desire to master knowledge, to penetrate into the essence phenomena of the surrounding world; detection of intellectual activity; motives for the manifestation of creative qualities of thinking: flexibility, originality, striving for creative self-realization; motives of internal self-improvement and self-development) and external (understanding the meaning of what has been achieved in the process of scientific and research activities, experience for future professional activity; motives of duty and responsibility to those who places hopes and expectations; drive to leadership (Knyazyan, 2006).

Thus, the motivational and value component of the future PhD's presupposes the presence of sustainable research interest, manifestation of leading motives of cognitive activity and systems value orientations.

The next operational and activity component of research competence of future doctors of philosophy implies readiness apply the acquired knowledge, skills and abilities in their practice activity It is formed in real research activity, which is carried out in specific conditions in accordance with norms and technologies scientific creativity, promotes the implementation of theoretical and empirical research methods. This component manifests itself in the following qualities personalities, such as attentiveness, thoughtfulness, diligence, erudition.

The subject of study of a number of domestic and foreign scientists (N. Andreev, I. Zimnyaya, I. Kovalenko, N. Kuzmina, etc.) became classification of research skills, which is understood as a set systematized knowledge, abilities and skills of the individual, as well as her views and beliefs.

In our research, we rely on classification research skills presented by researcher I. Zimnyaya. According to this classification, its constituent components are:

- intellectual and research (ability to analyze, correlate and compare facts, phenomena, concepts, thoughts; skill to see the problem, highlight the main thing; the ability to distinguish contradictions and formulate the problem; the ability to set a goal, define a task research; the ability to critically analyze data, give them an assessment; to argue one's attitude to the issues being studied; skill determine methodological approaches to research);

- information-receptive (the ability to observe, collect, etc process data; the ability to systematize and classify facts and phenomena; receive information, interpret it; work with scientific information, etc.);

- productive (conduct an experiment; perform a practical part of the research in a certain sequence; use methods empirical and theoretical research; carry out bibliographic search, summarize data; analyze the

course and research results; justify and defend the results research in the performance process; compose theses, write articles; prepare abstracts, reports, messages (Zimnyaya, 2010).

The reflective component of the research competence of future PhDs requires taking into account the ability to reflect own analytical activity. It involves introspection and self-evaluation of one's activity and its results, awareness and evaluation of the degree implementation of planned activity goals. The specified component contributes development of doctoral student's self-determination and goal-setting abilities, determines the individual's readiness and ability for self-improvement and self-development in professional activity (willingness and ability to study independently, conduct scientific research, evaluate own activity in the process of analytical activity, etc.).

The reflective component clarifies the level of development of self-esteem, awareness of one's own importance from other people, responsibility for the results of their professional activities. Condition of effective the formation of the reflexive component is an internal activity of a future doctoral student, which is aimed at self-control, self-discovery, self-development and self-improvement of the individual.

In the context of scientific research on formation the following structural components are distinguished in the research competence of future doctors of philosophy: cognitive, motivational and valuable, operational, reflective. Modernization of the educational process requires restructuring of the didactic process, revision and renewal educational programs, approaches to teaching, application innovative pedagogical technologies, methods, forms of education, in particular, the use of information technologies, distance learning, which is available relevant in today's educational environment.

*Justification of the methodology of research formation competencies of future doctors of philosophy.*

Definition of the theoretical foundations of scientific research provided it will be possible to characterize the methodology of research formation competencies of future doctors of philosophy in the doctoral process training on the example of academic discipline "Academic Writing".

The basis of the proposed methodology is the formation of research leading pedagogical and philosophical competences are assigned approaches to the organization of the educational process, namely, systemic, synergistic, informative, competent, activity and person-oriented.

In the context of the study of the application of the system approach allows you to take into account and use the following aspects, in particular, identifying the elements that make up the pedagogical system formation of research competence of future doctoral students; determination of internal connections between system elements; separation basic functions and individual components; identifying goals; establishment of communicative links of the pedagogical system with others environmental objects; finding out her condition functioning and prospects for further development, etc.

The importance of a systematic approach to the formation of research competence is due to the fact that the process of its formation represents is a complete system that includes various components, on the one hand, and on the other hand, the effectiveness of the process depends on interaction with others systems that ensure the educational process in institutions of higher education. Therefore, the systemic approach involves revealing the integrity of the process formation of research competence of future doctors philosophy, identifying its complex connections and interactions.

Consideration of a systemic approach requires consideration of elements synergistic approach as a direction of research methodology. In the study identified the structural components of formation research competence, which are systems synergistic nature. It is the application of elements synergistic approach is that they provide perception future doctoral student as an "open system" that is in a state relative balance and has potential opportunities for self-development and self-improvement. In addition, it stimulates doctoral students to be active of finding ways to solve the problem under study, which characterized by a high degree of independence and self-organization.

Future PhDs are not so much oriented towards creation universal worldview principles, how much for solving narrow ones research tasks. In our opinion, in the system and synergistic approaches include opportunities for dialogue, cooperation, creativity, individual development path of the future scientist as the

acquisition of a new systemic personality quality. Of great importance in the process of formation of research the competence of future doctors of philosophy acquires actualization information approach, which is determined by the informatization of society, rapid development of information technology and technologies. Essence of this approach is that when studying the object, the process whether phenomena in nature or society reveal the following characteristics:

- information is a universal, fundamental category;
- almost all processes and phenomena have an information basis;
- information is the content carrier of all processes taking place in nature and society;
- all existing in nature and society have interrelationships informational character.

Within our research, the informational approach is one of key, as it is related to information analysis and operation various types of information processes: purposeful search, collection, analysis, synthesis, comparison, quality-content transformation of information and its productive use for solving research tasks in the chosen field.

The application of the informational approach involves a thorough selection of a set of methods, means, techniques of learning for disclosure research abilities of future doctoral students in the process teaching the academic discipline “Academic Writing”, which will ensure the formation of research competence.

In the context of solving the problem of research formation competence of future doctoral students, the competence approach is one from significant conceptual provisions regarding updating the content of educational and professional programs in the relevant specialty. We fully agree with the opinion of the researcher O. Pometun regarding the definition of the essence of the concept “competence approach”, which is interpreted as “the focus of the educational process on the formation and development of key and subject-specific competencies of the individual. The result of such a process is the formation of a person’s general competence as a set of key competences, an integrated personality characteristic” (Pometun, 2011).

We emphasize that key competencies include the ability to independently obtain and process information, classify, compare, identify common features and differences in to the investigated problem, to establish cause-and-effect relationships, to express one’s opinions in a reasoned manner, the ability to defend oneself position, to think critically and logically, etc. Thus, research competence to a large extent affects the nature of the professional activity of the future doctor philosophy, promotes further professional growth, self-realization and makes it possible to solve research and professional tasks.

In the context of the study, we focus on the fact that the activity approach to the formation of research is being updated competence of future doctoral students in the process of studying the specified educational discipline, since the previous theoretical ones were obtained knowledge is directly related to practical skills and skills to apply them. The workshop approach to the formation of research competence is aimed not only at the assimilation of knowledge, but and on the ways of this assimilation, on the ways of thinking and activity, on development of cognitive powers and creative potential of the doctoral student.

Workshop approach to the formation of research competence in the process of studying the academic discipline “Academic Writing” involves the solution of scientific research tasks, the development of the activity abilities of an individual, which allows you to independently select methods, forms and means of learning from for the purpose of obtaining new knowledge, scientific facts, laws, theories. In organization takes place in the process of teaching an academic discipline such activities as knowledge creation, situation recognition and reproduction of the situation associated with this knowledge.

It is appropriate to emphasize that the workshop approach to formation research competence provides an opportunity effectively learn knowledge, develop skills independently and competently plan your research activities in the chosen field.

Note that a person-oriented approach is in the process formation of research competence of future doctors of philosophy is aimed at revealing the scientific potential of everyone a participant in the educational process, the properties of his thinking, namely, critical, taking into account individual (personal) needs.



According to the person-oriented approach of the center learning becomes a person as a subject of pedagogical influences. Ago the main thing is to take into account the leading motivation of the individual, integration of personal indicators and professional readiness in the process training of future doctoral students.

We consider the diagnostic and stimulating method of organization to be the essential characteristics of person-oriented training educational knowledge; activity and communicative activity of doctoral students; projecting individual achievements in all types of cognitive activities; taking into account the choice of content, methods, learning incentives and personal needs assessment systems. Therefore, the importance of a person-oriented approach formation of research competence of future doctors philosophy we see in the need to form personal analytical abilities that require purposeful development with taking into account individual personal characteristics.

In the context of the above methodological approaches, we see it is expedient to single out the leading principles of research formation competencies, namely:

- *the principle of scientificity* characterizes the correspondence of the content training of future doctors of philosophy at the level of modern science (connection between the content of science and educational discipline; formation scientific outlook; scientific approaches to solving research tasks; the use of appropriate methodology during the implementation research; possession and correct application of methods);

- *the principle of systematicity and consistency* represents preparation future PhDs as a system of certain integrity and complexity, involves finding and establishing connections, integrity, alignment properties and differences;

- *the principle of integration* is aimed at the formation of integral knowledge, integrative skills in future doctoral students with the help of organization of the educational process based on the integration of educational, scientific and practical activities;

- *the principle of connection between learning and life* is consistent with the concept of informatization of education and promotes the activation of use informational means, reinforcement of theoretical material examples and situations from real life, studying modern ones scientific theories, concepts, determination of prospects for the development of science; disclosure of the practical significance of knowledge and its application in practical activities; solving problem-search and research tasks;

- *the principle of consciousness and activity in education* provides intensification of the activities of future doctors of philosophy regarding assimilation knowledge, mastery of skills and abilities, awareness of goals educational and independent activities, planning and organization of one's own activities, solving scientific problems and ways of solving them;

- *the principle of professional orientation* guides the future doctors of philosophy for further professional and scientific activities, use of a complex of scientific and research tasks, development systems of motives that motivate the individual to perform professional tasks and self-development. As rightly noted by Shevchenko (2007), the result of professional orientation is formation systems of value motives that encourage the individual to learn professional knowledge, abilities and skills and methods of their creativity use in practice;

- *the principle of variability* implies a change in the conditions, the order of actions or the result of the task, in which the cognitive ability of the individual is strengthened, additional conditions are created for independent actions;

- *the principle of individualization* is aimed at the organization research activity in the conditions of intellectual co-creation in within the limits of general goals, tasks and content, taking into account individual characteristics of future doctors of philosophy;

- *the principle of self-realization* promotes independent acquisition of knowledge, abilities and skills in the process of formation of research competence, their independent deepening and expansion, involvement future doctoral students to perform research tasks;

- *the principle of interactivity* involves active performance research activity by ensuring interaction of the future doctoral students, which provides an opportunity for each participant of the educational the process of gaining new knowledge, skills and abilities; implementation of the principle takes place under the conditions of organization of joint activities by the teacher doctoral students (work in pairs, microgroups) for solving set problematic tasks;

- *the principle of continuity* ensures research orientation activities throughout life through self-improvement and self-education, further formation of research competence.

Given today's challenges and the conditions in which they are societies of all countries of the world, the spread of information technologies, Distance learning is especially important for innovative ones principles, in particular, free access to educational resources, integration educational resources, globalization of knowledge, WEB-multimedia presentation educational materials, multilingualism in the learning process, formation of a social and information personality.

Methodology of formation of future research competence doctors of philosophy in the process of teaching an academic discipline "Academic Writing" needs to be used as traditional and innovative methods: conversation, story, explanation, demonstration, illustration, problem presentation, "brainstorming", analogies, "circle of ideas", role-playing games, project method, case method. In the context of the study, we single out the following forms of implementation of the proposed methodology: problem lectures, seminars, master classes, projects, scientific and practical conferences, webinars.

To teaching aids include: technical means, Internet resources, educational resources, information and communication technologies (Google, Zoom, Moodle platforms). Course of academic discipline "Academic Writing" begins with a lecture on "Approaches to critical writing and reading. Academic English: features of academic reading and writing", which we conduct with the use of multimedia tools. Doctoral students were invited to watch the video in English language followed by a number of problem tasks that included pair work and work in microgroups, at the end problem lecture, it was necessary to identify and write down the key ones features of effective academic writing.

We characterize the application of the specified leading methods in the process of teaching the academic discipline "Academic Writing" for future PhDs. So, for example, the role-playing method was used to conduct conditional international scientific conference and oral presentation reports on the problem of own scientific research. Preparation took place in advance, doctoral students were offered a topic for discussion, distributed roles between participants. However, doctoral students independently prepared multimedia presentations and scientific reports for presentation at the conference. The above-mentioned method was used in the study of topics: "International conferences, meetings, discussions.

The use of the project method in the learning process ensures integration of subject disciplines, promotes the development of cognitive, creative abilities of the individual, critical thinking, skills independently construct their knowledge, orient themselves in information space. The project method is based on interaction and cooperation of participants during the educational process, promotes development different personality qualities - both autonomous and socially active personality capable of interacting in a group, bear responsibility for decision made. For example, when studying the topics "Getting to know grant projects, measures in the field of education within the framework of the program of the European Union Erasmus + in Ukraine", "Filling out an application for participation in an international conference; peculiarities of report preparation with profession with the use of academic vocabulary adopted in European scientific space" was offered to doctoral students find the necessary information on the topic, prepare in microgroups presentations and reports. Therefore, the project method promotes development critical reading and thinking, independence, ability to work in collective, forms a sense of responsibility of each doctoral student.

The "brainstorming method" was used at the beginning almost every lesson of an educational discipline with a goal stimulating creative activity and obtaining various options for solving a specific problem were discussed the most rational ideas for further work.

The method is useful for the formation of research competence “Circle of ideas”, which is appropriate to use during the discussion controversial issues or speeches of speakers from microgroups. Advantage this method involves the involvement of all participants in the educational process discussion of the debatable question, first in microgroups to generate ideas, then in front of the group. Mentioned the method contributes to the development of the ability to determine life values and goals, make the right decisions, use different methods of cognition, the ability to independently search, select, analyze and reproduce information, critical thinking, teamwork skills, culture thinking, the ability to perform various roles and functions in a team. This method became more active during the study of the following topics: “Academic culture and integrity: the European code of honor for a scientist”, “Transmission and exchange of scientific information based on reading texts on the subject. Strategies and principles of reading: commenting on an academic text”, “Filling applications for participation in an international conference; peculiarities of training reports on the subject using academic vocabulary adopted in the European scientific space”.

Effective in the formation of research competence, on in our opinion, there is a case method, which is based on the analysis of the practical situation and involves data analysis, identification of key problems, generation of alternative ways of their solution and selection optimal solution and action program. The essence of the case method is independent research activity of doctoral students in artificially created professional environment that allows to combine theoretical training and practical skills that are necessary for research activity in the chosen scientific field.

An important place in the use of the case method is occupied situational exercises for making a decision that promotes development critical thinking, encourages problem analysis and search the optimal way to solve it, presentation of the results of its search. For example, in the process of studying the academic discipline “Academic Writing” used “micro-teaching”, which is a kind of role-playing game and aimed at achieving a specific goal, namely, the creative application of acquired knowledge, practice of communication skills, demonstration of various methods subject-subject interaction.

An important role in the process of formation of research competence of future doctors of philosophy is played by the developed electronic methodical course of academic discipline “Academic Writing”, posted on the Moodle platform, use which helps doctoral students acquire theoretical knowledge from organization of scientific research, includes discussion of problematic questions, watching educational videos with the implementation of problematic ones tasks and further discussion, creating their own by graduate students presentations on the chosen topic of scientific research, methodical instructions regarding the performance of practical and independent work, test tasks for evaluation and control of knowledge.

We consider it appropriate to note that the use of the platform Moodle in the process of teaching the academic discipline “Academic Writing” has certain advantages: the teacher has the possibility of personal comfortable communication in a convenient for every time; doctoral students can receive comparatively larger volumes information in a shorter time; choose your own rhythm and mode acquiring knowledge; individualization of education, which enables everyone doctoral student to match his studies with his own needs; accessibility, which provides free access to educational materials; flexibility, which provides an opportunity to teach the material according to the level training and basic knowledge of doctoral students; creating a forum for exchanging information by answering each other’s questions.

The mailing service of the online learning system allows you to operate quickly inform all participants of the educational process about current events. The forum provides an opportunity for its participants to organize discussions urgent scientific problems online. So, electronic methodical course of academic discipline “Academic Writing” is an important means of open informational educational environment, which acts as a basis for successful educational activity and oriented towards formation research competence of future doctors of philosophy.

Thus, the effective use of information and communication technologies contributes to the formation of research competencies of future PhDs, since they act as a means of learning, a subject of study and a tool its formation.

## CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

Summarizing the above, we emphasize that in the context of our research:

- the essence of the key categories of the research was analyzed “competence”, “research competence” in scientific intelligence of domestic and foreign scientists, relying on various scientific approaches;
- based on theoretical analysis of scientific research it is established that research competence is the knowledge of how the result of a person’s cognitive activity in a certain field of science, methods, research methods that he must master in order to carry out research activities, as well as motivation and position the researcher, his value orientations;
- the following structural ones are singled out and characterized components of research competence of future doctors philosophies: cognitive, motivational-value, operational, reflective;
- the methodology was developed and theoretically substantiated formation of research competence of future doctors of philosophy in the specialty 011 Educational, pedagogical sciences in progress doctoral training on the example of the educational discipline “Academic Writing”;
- the methodological basis of research formation the competences of future doctors of philosophy are defined as follows methodological approaches: systemic, synergistic, informational, competent, active, person-oriented and principles: scientific, systematic and consistent, connection with life, consciousness and activity, professional orientation, variability, individualization, self-realization, interactivity, continuity;
- leading methods are singled out and characterized (conversation, story, explanation, demonstration, illustration, problematic presentation, “brainstorming”, analogies, “circle of ideas”, role-playing games, method projects, case method); forms (problematic lectures, seminars, master classes, projects, scientific and practical conferences, webinars) and means (technical means, Internet resources, educational resources, information and communication technologies) formation of research competencies of future doctors of philosophy.

We believe that it is a promising direction for further scientific research consideration is the implementation of innovative forms of remote training, which is the challenge of today, improving the system monitoring and ensuring the effectiveness of consulting and methodological support for doctoral training.

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## INTEGRATION THEORY AND EFFECTIVE PARTNERSHIP OF LOGISTICS CHAIN ENTITIES

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### **ABSTRACT**

*The main task of the subjects of the supply chain today is to transform logistics chains in such a way that the participants of cooperation will cease to feel the shortcomings of the forms of organization of their activities. The authors noted that one of the most noticeable trends in global markets recently is the need to integrate logistics operations and control the entire logistics system (production, supply, distribution), as well as to establish relationships between the customer company and the logistics service provider. The authors also formulated that the existence of partnership interaction is possible only when the corresponding agreed relations are established in the logistics chain, as well as when certain conditions of interaction are met. As a general conclusion, the authors determined that regardless of the content of logistics chain management processes, their essence boils down to the optimization of transaction costs when organizing supplies, and the competitiveness of enterprises in the consumer goods market depends on this today.*

**Keywords:** integration, partnership, supply chain management, logistics chain

### **INTRODUCTION**

The enterprise, as an open dynamic system, uses a set of resources and the corresponding processes of their transformation to achieve the goals of its existence. The functioning and development of enterprises are impossible without the management of material, financial and information flows that make up the essence of logistics. Comprehensive integration of all elements of management of direct and reverse material, financial and informational resources, and their operational and reliable interaction determine economic and environmental effects, increasing the sustainability of the enterprise in a competitive market environment.

The main goal of the research is to deepen the existing and develop new organizational and management proposals for improving the integration processes of the logistics chain in enterprise activities.

### **METHODS**

The theoretical and methodological basis of the work is the conceptual provisions of logistics, strategic management; analytical reviews of specialized periodicals, results of scientific research and materials of scientific and practical conferences, publications of foreign and domestic authors, collected by the authors in the process of research became the information base of the research.

### **RESULTS**

The enterprise, as an open dynamic system, uses a set of resources and the corresponding processes of their transformation to achieve the goals of its existence. The functioning and development of enterprises are impossible without the management of material, financial and information flows that make up the essence of logistics. Comprehensive integration of all elements of management of direct and reverse material, financial and informational resources, and their operational and reliable interaction determine economic and environmental effects, increasing the sustainability of the enterprise in a competitive market environment.

The integration process in the socio-economic aspect is "the process of formation and formation of a new integrity, ordering and coordination in time and space of its development, which is designed to perform specified functions at the social, ecological and economic levels", which confirms the importance of logistics as a "built-in function" integration process while ensuring partnership interaction of enterprises (Lisun,

2022).

Problems of integration of logistics chain subjects in the process of implementing their economic tasks are widely covered in foreign and domestic economic literature. So, for example, E.V. Krykavsky notes that "in a certain hypothetical dimension, specialization and massiveness exhaust themselves as potential reserves of obtaining an additional effect. Therefore, integration at qualitatively new levels of management becomes necessary, which is not the opposite of specialization as "despecialization", but integration in new planes and spheres. Thanks to such integration, higher-order "target" systems are formed compared to the integrated parts, and this creates an opportunity to obtain an additional effect, the source of which is the integration itself" (Krykavsky, 2004).

The implementation of logistics concepts in the activities of enterprises introduces changes in the work of individual structural subdivisions and requires a reorientation of activities in the direction of integration of efforts to perform logistics functions, the identification of which occurs completely under the fulfillment of logistics tasks and changes in the essence of the logistics process (Poplavska, Polianska, 2022). Foreign authors D.Bowersox and D.Closs note that in order for logistics to bring maximum strategic benefits, all its functional links must work on the basis of integration, and emphasize that "when logistics operations are largely integrated and form a key area competencies, they serve as a source of strategic advantages. The confidence that the integration of the system provides significantly greater results than the results of managing individual functions constitutes the defining paradigm of logistics" (Bowersox, Closs, 2002).

Today, logistics integration is interpreted as "a method, a form of system formation in a weakly structured environment, ... which allows for the synthesis of logistics systems at all levels of the economy: micro-, meso-, macro-" (Sabatkov, Sultanov, 2022). The potential possibility of logistics integration is embedded in logistics itself, the economic nature of which is expressed in a systemic approach to solving the problems of organizing the movement of flows (Skochylias, 2015).

In economic literature, the integration function of logistics is characterized by the following provisions (Kolodizieva, 2015):

- 1) integration of the function of forming business routes with the functions of determining transportation needs;
- 2) coordination of operational supply management and product transportation process;
- 3) cooperation in the management of goods traffic through the complex use of warehouses owned by entities that perform various logistics functions (supply and sales, transport, production, etc.);
- 4) optimization of aggregate costs for moving products due to the economic interest of transport, commercial organizations and the enterprises served by them in improving the processes of distribution and moving products;
- 5) development of specific functions of goods traffic management in combination with universal functions of the management process, their rational distribution among management subjects and concentration in the relevant structural divisions.

Justifying the expediency of logistics integration, researchers in this area draw attention to its advantages (Harisson, 2019):

- 1) improves the choice of strategic and tactical goals and, accordingly, the forms and methods of their research;
- 2) increases the effectiveness of developing alternative options for performing management tasks, planning the production and economic activities of enterprises;
- 3) increases the effectiveness of the use of evaluation criteria for management tasks to be solved to choose the best option;
- 4) makes it possible to apply methods that provide deeper and more reliable forecasting;
- 5) increases the efficiency of analysis and control of activities, covering all links of material and cash flows.

Summarizing the analysis of the publications, we can conclude that the issues of integration in the field



of logistics activity are relevant at the current stage of the economic development of enterprises. The theoretical developments of leading economists in this direction are supported by the conclusions of practitioners - as a rule, managers who, when making decisions about the management of material flows, recognize the need and effectiveness of the integration of logistics functions. At the same time, insufficient attention is paid to the applied aspects of this problem, in particular, to the justification of decisions regarding the integration of logistics activities in logistics chains.

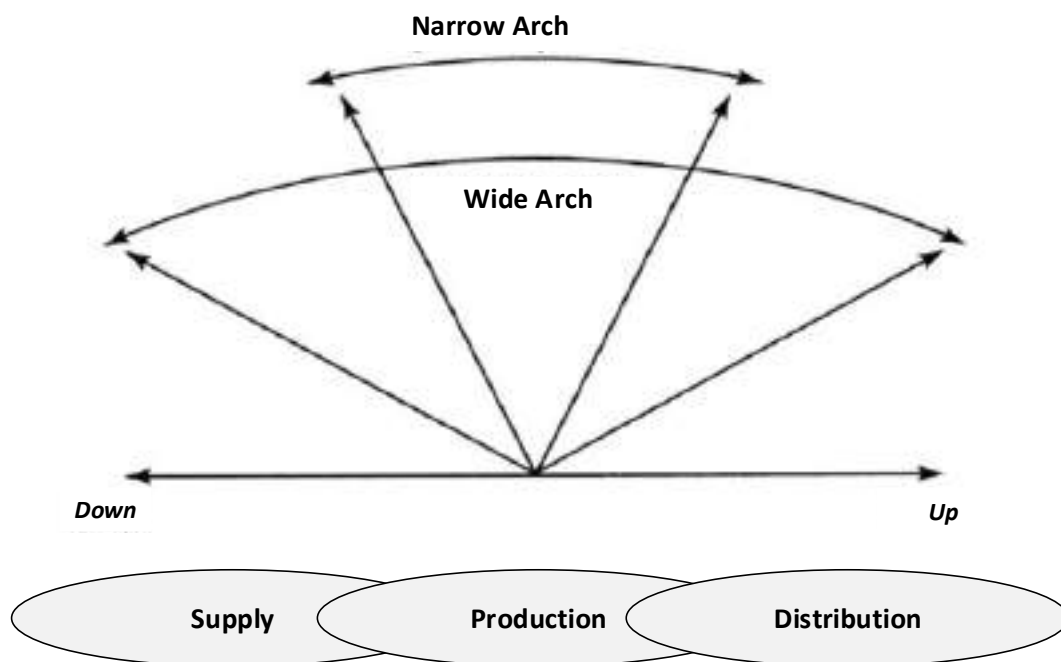
In general, the term "integration" (lat. *integratio* - restoration and whole) characterizes the gradual convergence and unification of economic subjects in the process of their interaction (interaction, mutual penetration, mutual enrichment) (Mochernyi, 2000).

The advantages that the subjects of logistics integration receive are characterized (Poplavska, Polianska, 2022):

- adaptability, quick reaction to changing circumstances;
- concentration of activities on priority areas of specialization, on unique processes;
- significant reduction of expenses, their rational structure, and increase incomes;
- preventing duplication of logistics operations;
- involvement in joint activities within the network of reliable partners.

Alan Harrison and Remko Van Hoek found that the strategies of the widest integration lead to the highest rates of significant improvement in the results of the enterprises, they presented this in the form of "arches of integration" (see Figure 1). In their opinion, wider integration reduces the uncertainty of the material flow in the logistics network, which, in turn, increases efficiency and reduces the time (Harrison, 2019).

The semantic analysis of the category "integration" is related to some concepts that also affect the ontology of the subject area. We can agree with the opinion of the author A.A. Pilypenko regarding the replacement of integration with the concept of a system approach, where the system is considered a complete entity. In addition, integration as a process requires the presence of a mechanism for real unification of the various elements of the enterprise into a single system. Therefore, the system captures the object form of the whole with a larger image, and integration reflects the processes of its acquisition (Skochylias, 2015).



**Fig. 1. Arches of integration**

Source: designed on the basis of (Harrison, 2019)

Achieving the greatest result from logistics associations depends on compliance with the basic principles of logistics integration, in particular (Kalchenko, 2003):

- coordination of all processes of goods movement, starting with the purchase of raw materials and ending with the delivery of finished products to consumers; integration of management and control over material flows;
- a single technology of material flow, which covers the complex of services provided to the clients of the enterprise;
- the adaptation of logistics systems to the changing conditions of the internal and external environment of logistics;
- rational organization of all elements of logistics, ensuring their consistency.

Specific forms of logistics integration are determined by a wide variety of factors, starting from the technical consistency of the main links of the logistics chain and ending with economic and legal restrictions on activity. According to the criteria of the duration of cooperation and the degree of interaction, the following forms of integration formations are distinguished: temporary cooperation, network business structures, temporary alliances, stable partnership relations, strategic alliances (Poplavska, Polianska, 2022).

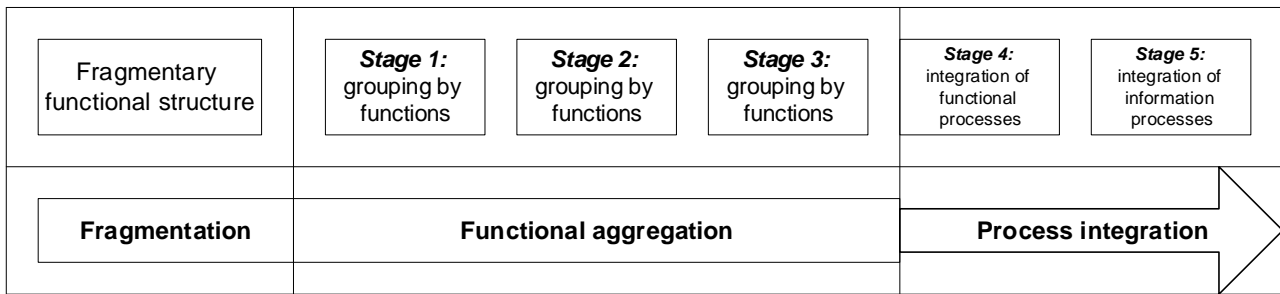
A general approach to combining logistics functions within the enterprise (internal integration) is the gradual integration of logistics functions with the aim of achieving a synergistic effect from their combination, which can be determined using indicators (Vasylevskyi, Bilyk, Deineha, 2008):

- elimination of unnecessary and unproductive logistics processes;
- rationalization of the organizational structure;
- increasing the "intelligibility" of the environment;
- optimization of the plane and factors of competition;
- systematic, total quality management;
- reduction of order fulfillment time;
- decrease in the level of aggregate stocks of raw materials, semi-finished products, and finished products;
- cost, product leadership, differentiation.

The synergistic effect of logistics develops at the stages of logistics integration at the operational level, at the level of logistics processes, covers the operational management of the material flow within the phase subsystems (supply, production, distribution), the next stage is the stage of cross-functional integration of the enterprise's spheres of activity, then it partially goes beyond the boundaries of the enterprise and involves the formation of inter-organizational logistics systems and supply chains and ends with the formation of complete logistics supply chains (Krykavskyi, 2004).

So, the above can be summarized by the scientific opinion of D.J.Bowersox and D.J.Closs, who identified five stages of evolutionary development of relations between logistics subjects (see Figure 2) (Bowersox, Closs, 2002).

As can be seen from Figure 2, the first three stages are directly related to the implementation of logistics operations. The fourth stage is associated with a qualitative transition from function management to process management. At this stage, the role of reliable information increases, and delegation of authority to independent divisions and company partners takes place.

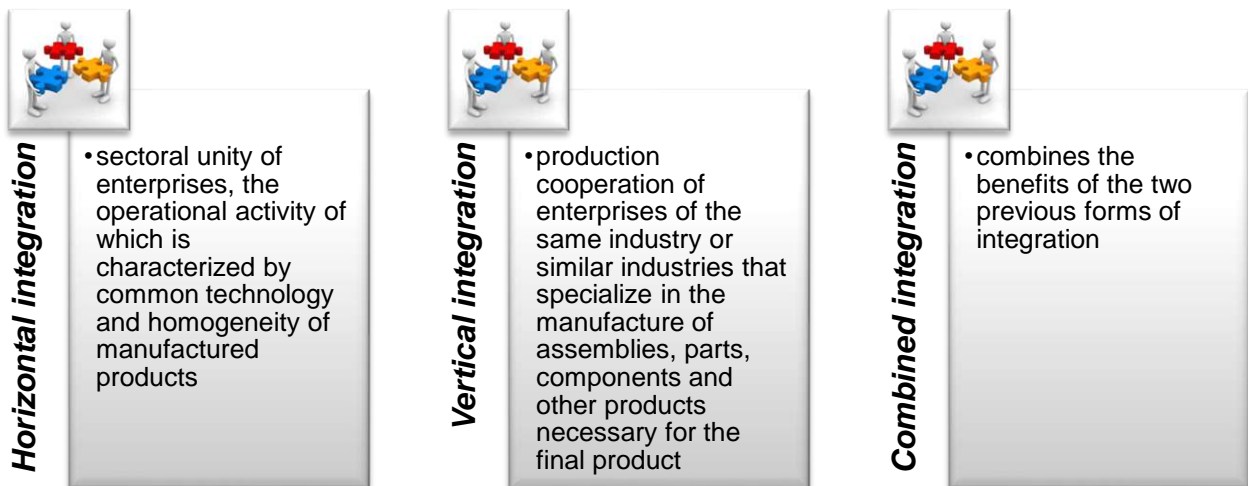


**Fig. 2. Evolutionary development of relations between logistics entities**

Source: compiled on the basis of (Bowersox, Closs, 2002)

To avoid the inconsistency of the main elements of the logistics system of the enterprise, it is advisable to supplement the internal integration with intra-industry and inter-industry logistics integration using the three possible directions shown in Figure 3 (Poplavska, Polianska).

There is no universal option for external integration for all situations. In some cases, efforts aimed at creating and maintaining a specific form of integration may not justify themselves. Therefore, an analysis of current operations, future plans, potential partners, potential enterprises for purchase is necessary, which will help to find out to what extent a certain form of integration will be beneficial for a particular enterprise.



**Fig. 3. The main directions of integration**

Let's consider in Table 1 the main ways of organizing the cooperation of enterprises in the logistics chain.

**Table 1. Ways of organizing cooperation between enterprises in the logistics chain**

№	The method of organizing cooperation	Characteristic
1	Informal agreements of enterprises on the joint performance of certain actions	Companies can jointly purchase goods to receive discounts for the volume of purchases; combine cargo for transportation, reducing transportation costs; agree on the size of the packaging to facilitate cargo handling; use general lists of best suppliers. The advantages are flexibility and lack of obligations. Disadvantages include the fact that each of the parties can terminate cooperation without warning at any

		convenient time
2	Formal agreements of enterprises based on written contracts	The obligations of each of the parties are established, for example, counter deliveries (services) in exchange for favorable conditions of cooperation (for example, the supply of goods at fixed prices on the condition that the customer purchases a specified quantity of goods). The advantages are: a detailed description of the characteristics of cooperation, that is, each party clearly knows what it should do. The disadvantages are the loss of flexibility and the need to work in tougher conditions
3	Formation of a strategic alliance or partnership	The basis for such alliances is mutually beneficial cooperation in the past, when the enterprises have the confidence that none of them will be able to win if they start interacting with other partners. Strategic alliances involve long-term commitments of the parties that guarantee future orders and deliveries. This stability enables businesses to invest in improving their products and operations
4	Vertical integration	The level of vertical integration shows the extent to which the logistics chain belongs to one organization and can manifest itself in the following forms: 1) acquisition of a controlling stake in another company, thanks to which it is possible to influence operations to some extent, although not necessarily control them; 2) creation of a joint venture; 3) purchase of another organization, which is the most frequent option of external integration.

*Source: compiled on the basis of (Poplavska, Polianska, 2022)*

One of the most noticeable trends in global markets recently is the need to integrate logistics operations and control the entire logistics system (production, supply, distribution), as well as to establish relationships between the customer company and the logistics service provider (Bozhanova et al., 2022; Horbenko, Pylchenko, 2022).

The development of the idea of integration and effective partnership of logistics chain subjects can also be traced by the classification and characteristics of services in the logistics market (Table 2).

The principles of activity of integrated structures should be voluntariness, the community of economic interests, freedom to choose the organizational form of the integrated structure, equal rights of all participants of joint activities and mutual benefit of cooperation, and the contractual basis for organizing relations between participants and structures in general. Enterprises that are part of them retain their independence and rights as legal entities. Their activities are based on independently developed plans and programs of joint activities. They can create firms, centers, and production that will act according to the charter approved by the governing bodies of the integrated structure (Poplavska, Polianska, 2022).

**Table 2. Characteristics of services on the logistics market**

№	PL-provider	Description of the services provided by the PL-provider
1	First Party Logistics (1PL)	system in which all operations are performed by the cargo-owning company itself
2	Second Party Logistics (2PL)	system that makes it possible to perform a range of traditional services for the transportation and storage of goods;

3	Third Party Logistics (3PL)	system of additional services, which includes both traditional warehousing and intermediate storage (the so-called cross docking) of cargo, as well as the design and development of information systems, the use of subcontractor services
4	Fourth Party Logistics (4PL)	system that involves the combination of functions of all organizations involved in the process of supplying products. The tasks of the 4PL provider include planning, management and control of all logistics processes of the customer company in order to achieve longer-term strategic goals and expand business tasks
5	Fifth Party Logistics (5PL)	system, which is the so-called Internet logistics, is the planning, preparation, management and control of all components of a single chain of cargo transportation using electronic means of information

Source: compiled on the basis of (Hehamonov, 2022)

The need and conditions for the integration of logistics functions are determined by the strategic directions of activity and the determined logistics strategy of the enterprise. To achieve the desired integration of logistics functions and operations at the enterprise, it is necessary to consider internal activities and criteria that ensure the effective movement of material and information flows under the production program and the terms of the contract policy. Although internal integration is a necessary condition for successful operations, it alone is not sufficient to achieve the goals of a business enterprise. In the external competitive environment, the enterprise can function successfully only if it manages to involve suppliers and consumers in the integration and such external integration is carried out based on logistics chain management. It is important to determine those parameters, the observance of which will ensure the required level and result of integration (Filipishyna, Bessonova, Venckeviciute, 2018; Poplavaska, Polianska, 2022).

In contrast to competitive relations, the existence of partnership interaction is possible only when appropriate agreed relations are established in the logistics chain, as well as under the following conditions (see Figure 4): availability of sufficiently stable economic ties; the presence of a certain degree of organization of the economic flow; the existence of a system-wide goal shared by all participants of the logistics chain; the presence of a desire among all participants in the chain to find and establish a compromise.

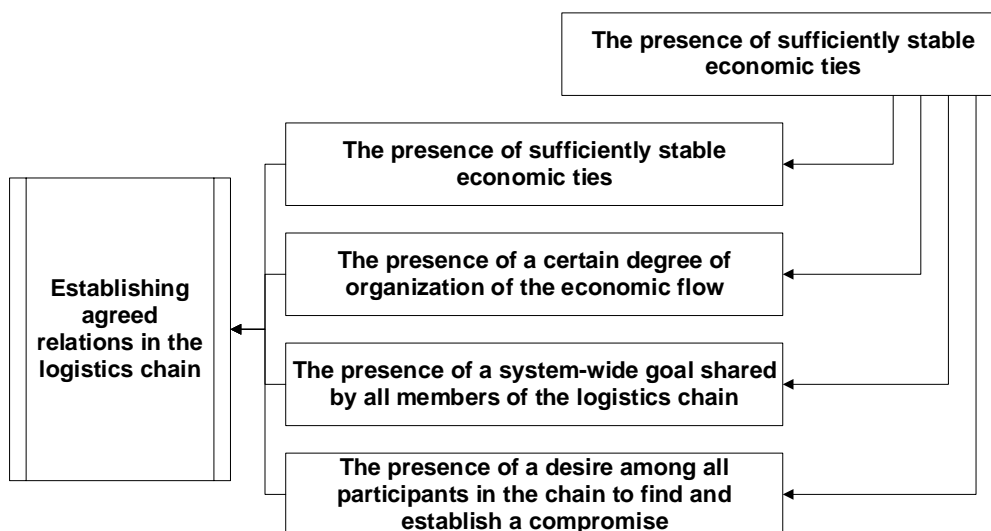


Fig. 4. Conditions of existence of partnership interaction between participants of the logistics chain

Source: compiled on the basis of (Kulyk, Hryhorak, Kostiuchenko, 2012)

## CONCLUSIONS

Summarizing the above, it should also be noted that integration between enterprises is impossible without the concept of partnership since it is advisable for enterprises to focus on the economic essence and maximization of the effect of interaction, which generates complementary benefits of the integrated efforts of individual entities of the logistics chain.

So, today, one of the main tasks of the enterprise is the coordination of the interaction not only of its individual divisions that perform logistics functions, but also of partner organizations (suppliers, transporters, wholesalers), which, in turn, determines the emergence and functioning of integrated logistics structures. The integration of logistics cannot be isolated from other processes and phenomena at the enterprise; therefore, it is important to understand what obstacles may arise on the path of integration of logistics functions, what advantages and disadvantages this process creates for the enterprise. In practice, such obstacles arise in connection with the organizational structure, performance evaluation system, inventory management, information technologies, and the experience of operating a knowledge exchange system at the enterprise.

Therefore, an important point in the further development of enterprises - subjects of the logistics chain is the development of integrated forms of their functioning, which arise on a contractual or joint-stock basis, covering some or most of the services provided by intermediaries. These integration forms and methods have been widely developed in recent years and are manifested in the contractual relations of industrial firms with independent trade intermediaries, in the creation of associations of consumers and producers in economic relations, in the structuring of horizontal relations of intermediary organizations. It is promising to develop integration relationships between consumers and producers based on the creation of logistics networks, which makes it possible to reduce costs, inventory handling costs and management costs.

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## LAND AND WATER RESOURCES MANAGEMENT BASED ON THE BASIN ORGANIZATION OF NATURE USE

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### **ABSTRACT**

*Effective state and transboundary management in the field of use, protection and reproduction of land and water resources will be facilitated by the transition from the administrative-territorial to the administrative-basin system of land and water resources management, according to this system, the main unit of management and development of environmental protection measures will be the basin of the water body. Studying the flows of matter, energy and information inside the basin allows modeling the anthropogenic impact on natural complexes in general and on its individual components as a result of nature use, predicting the results and adjusting agricultural activity. It is presented the method of determining the internal geomorphological structure of the catchment area and creating an ecological frame of the river basin using GIS technologies. Existing approaches and their advantages in studying the state and modeling processes of basin territorial structures are described. It is proposed a conceptual model of ecologically rational exploitation of the catchment area, which includes: creating an ecological frame of the river basin based on the identification of the internal geomorphological structure of the catchment area; the development and stuffing of the geoinformation and analytical system of the river basin, including the assessment and forecast of the ecological situation and the determination of the most agrogenically transformed sub-basins of different orders; the development of the project of the basin organization of nature use, including the ecological and resource characteristics of the current state of the territory of sub-basins of different orders and the evaluation of the effectiveness of the implementation of the project. It was developed the algorithm for assessing the state of the catchment area, also was made the project of the basin organization of nature use applying GIS and remote sensing technologies. It is proposed the creation of mechanism and justified the prospects for the introduction of a geoinformation and analytical system for the support of basin nature use principles, which foresees the systematization of multi-level and sectorial information of monitoring observations with a purpose to create of soil and water protection measures.*

**Keywords:** *land and water resources, river basin, scientific approaches, geoinformation and analytical system, ecologically rational exploitation, management, nature use.*

### **INTRODUCTION**

In recent years, the river basin become the most promising object of geographical research regarding the establishment of spatio-temporal patterns of organization and interrelations of stabilizing (environment) and destabilizing (anthropogenic environment) components of ecosystems, [1] it is evaluated as "a specific spatial unit of the biosphere, the most perspective for the multi-faceted study of nature, economy and environmental management".

The basins have fairly clear natural boundaries - watersheds and internal functionally holistic closure of migration flows of surface and subsoil water flow, as well as migration of dissolved substances and soil solids, the take-out of which is carried out through the closing gate of the catchment area [2]. The basin is represented as limited by a watershed part of the earth's surface, taking into account the thickness of the soil, from where the runoff of water flows into a separate river occurs. This is a water balance system in which precipitation is transformed into other elements of the water balance. Therefore, the precipitation regime, temperature characteristics of the climate and everything that determines the ratio of elements of the surface water flow balance has a significant importance for the formation of basins. From the point of view of climatic features, river basins forms where the amount of precipitation exceeds their evaporation and filtration of water in the soil [3].

Traditionally, in hydrology, the river basin is considered as a catchment surface that determines the volume of runoff, the nature of the water regime, and other hydrological characteristics of runoff, solid runoff,



and flow of substances. A special place is given to the erosion research in the study of river basins [4]. Any erosion form has its own surface water runoff basin, or catchment area. Catchment areas of different rivers (watercourses) are separated from each other by watersheds.

In river basins, it is easy to distinguish such paragenetic relations, in which the upper link determines the behavior of the lower link, and the lower link integrates the phenomena that occur in the upper links of the basin [5]. In particular, the most important function of the relations between ecosystems components (biotic and abiotic) [6] occur at the basin level. Between them there are genetic, historical or functional connections, they are expressed by the continuous exchange of substances, energy and information. The river basin acts as a holistic system with established ecological, social and economic connections [7, 8]. Also, the basin is a naturally organized territorial unit that provides the possibility of establishing true spatio-temporal patterns of consequences and the degree of human activity influence on the degradation of natural ecosystems [9, 10].

The basin of any river during the commercial use is subjected to certain anthropogenic loads. Moreover, the need for water resources of rivers is constantly increasing, which, accordingly, affects the quantitative and qualitative indicators of their condition [11]. The river is both a source of water and a receiver of wastewater [12].

The most vulnerable to anthropogenic influence are small rivers, in particular, it concludes in plowing of catchment areas, their excessive saturation with row crops, melioration, insufficient forest cover [13]. All this intensifies the erosion processes that lead to siltation and pollution [14], changes in the water-physical properties of soils [15, 16], thermal and water balances [17], disruption of the hydraulic connections of surface and ground waters, as well as the conditions of flow formation [18-20].

The situation is further complicated by the fact that during the recent years there has been a tendency of active diversion of the coasts and floodplains for cottage construction, horticulture and gardening [21]. Therefore, modern approaches to the study of anthropogenic impact on catchment areas and river valleys should be based on ecosystem [22, 23] and basin approaches [1], which are focused on a comprehensive assessment of water and land resources use, on the structure of landscapes and their destruction. The advantages of basin approach using are [24]: clarity and simplicity of border highlighting; a hierarchical structure that allows to move to different territorial levels of management; organization of unidirectional flows of matter, energy and information; geo-system connection, which allows to carry out all types of ecological monitoring; affiliation of soil and vegetation cover, settlement and nature use systems to separate basin structures; localization of technogenic sources of environmental pollution along catchment basins – watercourses.

The basin approach has wide use in ecological and geographical studies [25-28]. Studying the flows of matter, energy and information inside the basin allows modeling the anthropogenic impact on environmental complexes and its individual components (including water and soil) as a result of nature use, predicting the results and adjusting commercial activities [29]. The advantages, objective necessity and expediency of the integrated water resources management, based on the basin principle, are recognized all over the world. Countries with different state systems are forced to find the ways of cooperation between the participants of the water commercial complex and to solve jointly the tasks of its development within the framework of the basins of water bodies. The result of long-term discussions by the members of the European Union of a complex policy on water resources management became the fixing of the basin principle of water resources management in the EU Framework Directive 2000/60/EC [30].

It defines that integrated water resources management based on basin principles will provide a process that will facilitate the coordinated development and management of water, land and related resources to increase the effectiveness of economic and social welfare on the principles of equity for the sustainable development of important ecosystems.

### **ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS.**

During recent years, the basin principle has been increasingly used to identify and forecast the aggravation of environmental protection problems, when territorial generalizations are made by hydrographic basins in different natural zones. Korytny L. M. [1, 24] emphasized that the basin approach is the basis of modern geocological assessment of territories.

Dolzhenko V.A. [31] emphasized the need for a wide and consistent implementation of the principles of administration and law regulation in the field of water bodies' use and protection based on the basin approach. Shvebs G. I. [32] proposed the separation and study of natural-commercial units based on the basin approach aimed on optimizing nature use. Resulting the search of a solution to the problem of combining administrative borders with natural boundaries, the basin concept of nature use is becoming increasingly attractive [1, 22, 24, 29]. Traditionally, the mechanism of natural resource management is administrative-territorial, which in most cases does not correspond to the boundaries of natural territorial systems. This approach has priority due to the well-established system of receiving information about territories for making management decisions and assessing the economic efficiency of commercial activity. But the generalized average ecological indicators absolutely do not reflect the spatial differentiation of the evaluated indicators within the administrative boundaries [33]. Therefore, there is an awareness that multifaceted phenomena of society's interaction with nature can be studied and regulated only with the help of basin and geosystem approaches in combination with complex territorial and landscape analysis [34, 35].

Thus, it can be stated, that the basin approach to various geographical and ecological and economic problems has proven its vitality, necessity and perspective during almost half-century history. Starting with its application in land hydrology, in other sciences of the physical-geographical cycle and landscape science, it is now increasingly used in geocological studies to solve the problems of balanced nature use, which is justified from methodical and organizational positions and has been confirmed with concrete results. The basin principle of water resources management determines the prerequisites and directions for the creation of a modern mechanism for the use, protection and reproduction of water in Ukraine [5], which will correspond to the most effective international practices and will enable the implementation of the state strategy aimed at preventing the exhaustion of water resources and achieving the high water quality [36].

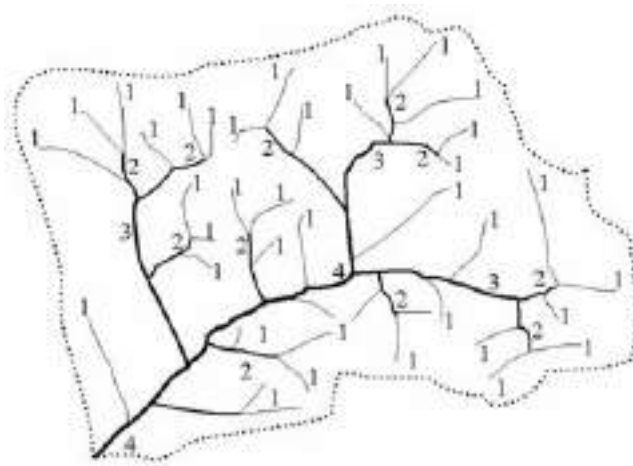
Implement the theoretical and methodological justification of water and land use safety, according to the basin principles, with a help of geoinformation systems (GIS) and remote sensing technologies.

### **MATERIALS AND METHODS.**

For the spatio-temporal study of the water and land resources state within the rivers basins, the development of environmental protection measures based on the basin concept of nature use, an important task is to create correctly the ecological framework of the river basin, with the determination of the internal geomorphological structure of the catchment area using GIS technologies.

To divide river basins into groups, depending on the order of the main *riverbed*, the Strahler-Filosofov approach [37, 38] was used. According to this approach a watercourse (or the riverbed of a temporary watercourse) that does not receive an inflow belongs to the riverbed of the 1<sup>st</sup> order. Two riverbeds of the 1<sup>st</sup> order, merging, give the beginning to riverbed of the 2<sup>nd</sup> order. According to this rule, a riverbed of a higher order begins below the junction of any same-order watercourses (the order increases by one).

When merge of different-order watercourses take place the watercourse formed below of their junction keeps the order that has the watercourse before the same-order watercourses merged (Fig. 1). The study of the features of the geomorphological work load on the river basin and all landscape components, together with determination of characteristics and water flow parameters, is possible only under the condition of basin organization of the territory at the level of catchments of erosive forms of the IV order, which foresees the possibility of detecting the landscape heterogeneity of the territory [24].



**Fig. 1. The structure of the river basin of the IV order (according to the Strahler–Filosofov coding of the river basins): ... – watershed line, 1<sup>st</sup>-4<sup>th</sup> – orders of watercourses or erosion network**

Division (zoning) of the territory into river basins is one of the most typical and necessary operations in hydrological and ecological research. River basins can act as the main operational and territorial unit during zoning, assessment of the intensity of erosion processes, etc. The application of the basin approach is geographically and ecologically justified (the basin is a natural and sometimes a natural-commercial system). Geomorphological studies of the positional and dynamic structure of the river basin must be carried out on the basis of data from the Shuttle radar topographic mission (SRTM) - radar topographic survey of most of the territory of the globe, with the exception of the northernmost latitudes ( $> 60$ ), southernmost latitudes ( $> 54$ ), as well as oceans, which was created in 11 days in February 2000 using a special radar system. The two radar sensors, SIR-C and X-SAR, have collected more than 12 terabytes of data (which is roughly the size of the Library of Congress).

The allocation of watercourses, determination of their orders and catchment areas is performed using the ArcGIS program on the basis of a digital relief model using algorithm of the hydrological geomodeling from working module the Hydrologytools of Spatial Analyst Tools, improved by our team [39-41], which includes eight sequential modeling steps.

Step 1. Visualization of the digital relief model (DRM) based on SRTM-90 with a pixel resolution of 90x60 m.

Step 2. Filling the incorrect lowering of the relief using the “Fill” function. With the help of this function, the correction of the DRM is performed in order to create the correct grid of cumulative (total) flow.

Step 3. Modeling of the flow directions grid using the “Flow Direction” function, this allows to find out the flow direction according to the structure of the connections of 8 neighboring rhombuses. They determined by the morphometric characteristics of the relief (slopes and exposures). That is, the direction of the maximum slope from the center of the cell to the centers of 8 neighboring cells is determined.

Step 4. Modeling of the cumulative flow grid using the “Flow Accumulation” function, it is based on the flow directions grid.

Step 5. Identification of watercourse cells with values of cumulative flow above the specified value. At this stage, the procedure of selecting the limit value of the cumulative flow is performed using the “Con” tool, which is part of the “Conditional” tool set. “Con” function, an important part of the “ArcGrid” command, which is necessary to determine the correctness of the values in input data cells and comprehensive control of the output data.

Step 6. Determination of watercourse links by the “Stream Link” function. Links of watercourses are separate spatial linear segments of continuous flows, which are interconnected by a sequence of nodes (points) of exit (outflow of a 1st-order riverbed or the beginning of a higher-order outflow) with end nodes (points) of a watershed (the estuary of different-order watercourses).

Step 7. Assigning an order to each link of watercourses using the “Stream Order” function. Each watercourse, which is a link of the network, is classified according to the order given to them, which depends on the interconnection and sequence of the nodes.

Step 8. Determination of the drainage (catchment) area of each link using the “Watershed” function. The drainage (catchment) area of the watercourse basin is determined based on the grids of the flow and watercourses direction for which it is calculated.

The presented algorithm assumes that the researcher sets some limit value, expressed through the minimum number of raster cells or the minimum water catchment area (km<sup>2</sup>), which gives surface runoff. During the building of the river network model based on the flow accumulation raster, the limit value of the selection of cells that are the components of the channel network is taken equal to 600. This limit is due to the fact that in the use of a digital relief model based on SRTM-90 data for the automatic selection of a river network by means of GIS technologies there are some limitations related to the presence on the digital relief model of vegetation and artificial structures, which complicate the reliability of the selection of the upper links of the river network and allocation of watersheds of the river basin. After obtaining the geomorphological model of the basin organization of the catchment area, additional manual correction is carried out to improve the quality of modeling.

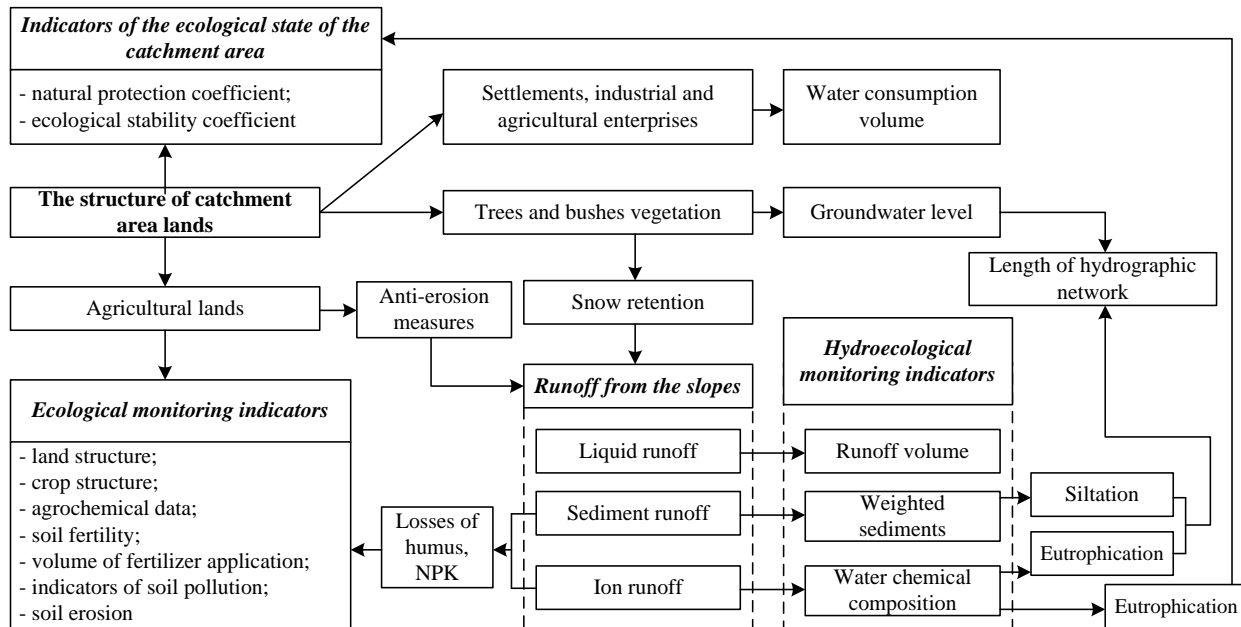
The analysis of the internal geomorphological structure of the catchment area of the basin makes it possible to study in detail its positional-dynamic spatially-organized system, the components of which are sharply different from each other in terms of type, composition, level of organization, nature and duration of exploitation, which determines the individuality of the existing ecological situation in their catchments, which collectively form a certain ecological state of the catchment region which is studied.

## RESULTS

Effective state and transboundary management in the field of use, protection and reproduction of land and water resources will be facilitated by the transition from the administrative-territorial to the administrative-basin system of land and water resources management, according which the main unit of management and development of environmental protection measures should be the basin of a water object. The introduction of integrated management of water resources according to the basin principle will contribute to sustainable territorial development, coordination of the development of the water sector, sustainable use of related resources, creation of an efficient economy and improvement of the quality of life of the local population of the state [42, 43].

The basin approach can be complemented [44, 45] and implemented in parallel by the eco-regional approach to monitoring and managing the quality of soil-land and water resources. The eco-region is a holistic natural-commercial formation, which is evaluated by the degree of anthropogenic influence and the transformation of natural landscapes. The general ecological state of eco-regions is determined by the rank of ecological tension – the degree of landscapes transformation, as a result of a certain combination and ratio of areas of ecological situations of varying severity. For example, in a certain eco-region, a specific "background" quality of local water flow is formed under the influence of geographical features, including regional geochemical conditions and the historical development of commercial activity. They determine the features of spatially distributed sources of additional substances entering water bodies. The concentration of these substances is determined by the priority sources of pollution in the eco-region, the spectrum of which is determined by the industry that dominates in this catchment area. During the agricultural development of land, these substances are nitrogen, phosphorus, potassium; during the melioration – sulfates and iron; during industrial development – chloride and sulfate ions. Each eco-region differs by range of water quality indicators typical for it and, thus, by target indicators of the state of water bodies, which are established taking into account the ecological-commercial state of the catchment area. This principle of regulating the state of water bodies is the basis of the framework Water Directive of the European Union [30] and is aimed at preventing the deterioration of the state, protecting and restoring of water ecosystems and groundwater. In

particular, the combination of eco-regional and basin approaches allows singling out territories that are homogeneous in terms of natural-anthropogenic conditions, which become the object of further complex ecological monitoring, that combines elements of agroecological and hydrological monitoring (Fig. 2) [46].



**Figure 2. Links between indicators of agro- and hydroecological monitoring.**

From a basin perspective, an eco-region is a natural-commercial formation, the external and internal boundaries of which are defined by subsystems of a certain level of hierarchy, holistic by common spatial relations, which are determined by hydrofunctioning. With this understanding, the ecoregion and its basin structures become the objects of the water management complex and basin organization of nature use.

Basins are the holistic ecosystems of a high level of organization with developed feedback links. If the regime of the riverbed is disturbed in the middle stream, it will no doubt cause a certain reaction in all ecosystems of the basin - both upstream and downstream, and in lateral directions – that is, in the ecosystems located on the upper watershed levels of the basin, that are remote from the riverbed. Also, in the works of scientists [47, 48], the basin system is considered as a geoecological system with inputs and outputs for flows of matter, energy, and information. They are functions within defined space-time limits, which are allocated by the upper and lower boundaries of the watershed, and coincide with the surface of convective atmospheric processes and the upper horizon of waterproof rocks. In this regard, the ecosystem approach to the analysis of the state of river basins has acquired special importance. It is based on previously developed ecological models of small rivers and reservoirs [49], which are important local structural natural units of transboundary rivers and reflect changes in the state of rivers in the course of increasing anthropogenic influence [2, 5, 10, 11]. In particular, the basin of a small river [50, 51] is a complex self-regulating system that has the ability to function separately from changes in external conditions and is an important indicator of the state of the environment of transboundary catchment areas. This indicator is determined by the level of anthropogenic load on the components of its landscape ecosystems, which are a complex of biogeocenoses on a homogeneous area of the Earth's surface. They are combined with each other by genetic (by origin), historical (history of the development), geochemical (geochemical combination, water flow, transfer of organic and mineral substances) and biotic links (migration of animals, transfer of spores and plant material) and covered by a certain type of agricultural use [1, 2, 5].

It is proposed to use large basins zoned according to bioclimatic zones as a basis for natural-resource zoning. This principle of zoning to the greatest extent links together water, climatic, mineral and land resour-

ces. Determining the anthropogenic impact on the river basins of small and medium-sized rivers in the existing socio-economic conditions has an important sense, because the possible loss of these ecosystems will lead to a number of global environmental problems (reduction of the water level of 1<sup>st</sup> order rivers, loss of valuable biological species, etc.) [52]. The ecological revival of large transboundary rivers should be based on the development of corresponding strategies, the scientific basis of which should be real information about the ecological condition of subbasins of small and medium rivers in their composition and the constant interaction of the relevant services of the countries of the transboundary basins. In the mid-90s of the XX century the ecosystem approach was further developed for the needs of assessment the parameters of the ecosystems and their components state, taking into account functioning for the purpose of ecological regulation [53]. In the use of this approach, it is noted that the anthropogenic impact on the river ecosystems is fundamentally related to the additional supply of matter and energy. The ecosystem is able to process and absorb part of the substances, and the rest is released and taken beyond its borders. The more excess substances accumulate in the ecosystem, the more energy it needs for their disposal or transfer to another ecosystem.

The main source of such energy is hydrophysical processes that cause certain flow processes, stream speed and wateriness of the river. They are characterized [54] as the main integrating ecological factors that participate in the formation of the geosystem and directly determine its boundaries and the direction of the circulation of substances. Currently, as a result of deforestation [55], significant plowing of landscapes [9], intensification or chemization of agricultural production [56], there is a systematic income and constant growth of biogenic elements [10] in the ecosystems of most rivers. In parallel, the costs of irreversible water consumption increased, the flow of rivers was transformed, as a result the natural energy of river ecosystems decreased, this caused a significant deterioration of the ability of rivers to transfer mineral and organic substances to other water systems. This led to their accumulation and, as a result, regulation, siltation, degradation and complete disappearance of small rivers [57]. Ecological forecasting [58] of the probability of changes in the state of river ecosystems is important for solving the problem of rivers in conditions of uncertainty and instability of their pollution sources.

Insufficient validity of the theoretical prerequisites for similar studies of transboundary rivers, violation of the principle of unity of ecological and economic aspects of the capacity of ecosystems during the exploitation of natural resources by countries in their basins, led to the various negative environmental consequences. The lack of reliable forecasts of the development of the situation on rivers and their catchment areas has led to waterlogging and salinization of large areas of land, a decrease in their productivity, and water pollution. The result of ecological forecasting of the situation and rational nature use in river basins should be the determination of the optimal structure of ecosystems of individual types in the composition of sub-basins of various orders, the determination of the links between its elements and the determination of their role in the functioning of the ecosystem as a whole.

There is a need, first, to determine the degree of transformation of the ecological balance of the river ecosystem by individual types of different sub-basins; second, to select reference sub-basins of rivers for their assignment to the conservation fund; third, to implement the integration of environmental protection strategies for the implementation of enhanced environmental protection measures on the territories of ecologically disturbed sub-basins of rivers into the Strategy for the socio-economic development of the countries of transboundary basins; fourth, make a more detailed study of the regularities of river ecosystems formation, their hydrobiological regime, to determine the productivity of the mechanism of income and behavior of pollutants, the organization of monitoring on protected and degraded river sub-basins of different orders. The results of such studies should become the basis for forecasting changes in the ecosystems of river basins and the development of reasonable concepts for rational nature use within them [59-61].

Korytny L.M. [1, 24] in his works used a geosystem-hydrological approach to study the river basin. He noted that the basin represents a real geosystem that is easily distinguished on the map and terrain, has a clear hierarchical order of river systems classification, in which water bodies most often serve as a means of

spreading and accumulating pollutants. Therefore, from our point of view, the river basin can be considered as a functionally integrated shell of the geosystem with its own input and output. Inside this shell, individual naturally- and anthropogenically determined processes of conjunction and circulation of substances take place.

The main task of studying the basin organization as a geographical system is to identify the spatio-temporal hierarchy of elements and phenomena located on the earth's surface by dividing the whole into parts; determination of spatial forms of structures of different rank and identification of regularities that determine the quantitative relations between the internal elements of these structures; identification of the type of the system organization and determination the degree of its organization. Allocation of river basins is one of the most typical operations in hydrological and ecological research, which today is significantly simplified with the use of a geoinformational approach based on updated geoinformation systems. In addition, the active development of computers and geoinformation technologies recently allows obtaining the necessary characteristics of water resources reserves and the ecological state of water bodies [62] for timely management decisions regarding the rational use of water resources of a specific basin more fully and faster compared to traditional methods. Currently, various methods of analyzing surface and ground water resources, including the use of GIS technologies, have become widely used. Geoinformation systems are increasingly used both for operative calculations and assessment of water resources, their catchment areas, and for studying the hydrological regime of water bodies. The processes of collecting, processing and interpreting data, modeling hydrological networks and preparing proposals for decision-making using GIS technology and computers are solved more easily and efficiently than before in hydrological practice. GIS technology can quickly represent water bodies and their catchment areas together with hydrographic characteristics, hydrological stations and measurement data on digital or paper maps. This allows carrying out automated comprehensive analysis and interpretation of observation materials and space images to obtain a detailed picture of the processes taking place [58].

The use of geoinformation systems for a comprehensive assessment of the state of river basins involves the following types of work [63]:

- research of the structure of river basins, which allows to identify the mechanisms of the basin functioning as a geosystem;
- collection of information about natural conditions, pollution of surface and ground waters using stock materials of environmental monitoring organizations, as well as field research data;
- identification of the main factors that determine the conditions for the development of negative natural processes and changes of indicators of the surface waters state;
- modeling of generalizing maps of the natural conditions of the studied region, as well as zoning maps of the basin in relation to the level of anthropogenic transformation, the state of surface water quality;
- analysis of zoning results.

The final result of studies of the ecological state of river basins should be the establishment of ways of optimization and development of geoplanning projects of basin nature use [64, 65]. Geoplanning involves a comprehensive approach to the problems of territorial planning of the basin, which considers the integrated components of the landscape shell – nature, population and commercial activities.

Geoplanning performs geoecological aspects of the ecosystems functioning through a complex of project solutions. At the same time, the priority is the justification of their rational spatial combinations on each plot, in each basin, region and the country as a whole. The most optimal combination and interaction of the components of the landscape shell are achieved through the implementation of three components of geoplanning: the formation of the ecological framework of the region, ekistic (method of settlements creation) territorial systems and the framework of anthropogenic and technogenic loads on the environment.

In regions with agrarian specialization, the object of geoplanning is agricultural lands – a particularly valuable natural resource, here land acts as the main means of production and the basis of sustainable development. In particular, geoplanning [2] is a deep complex approach to the study of sustainable natural-

anthropogenic relations in the geographical shell. It includes the principles of both ecological-landscape planning, with its emphasis on geocological optimization of territories, and territorial planning aimed at *satisfaction* the socio-economic needs of the region. Geoplanning eliminates contradictions between ecological-geographical and socio-economic approaches to the organization of nature use, as it takes into account the ekistic factor that determines the main types of commercial activities of the population and the general level of anthropogenic-technogenic loads on the environment within the settlement system, the main indicator of which is river systems and their basins. The output object of geoplanning is an integrated territorial socio-natural-commercial complex.

### GENERALIZATION OF THE STUDY

Due to the need of changing the existing situation in the management of water and land resources, to develop effective measures of basin nature use in order to solve soil protection and hydroecological problems and improve the ecological state of the environment, special measures are required.

The most promising are the development and implementation of a conceptual model of ecologically rational exploitation of the catchment area on the basis of a geoinformational and analytical system of monitoring and management of basin nature use. As well as methods for determining the structure of the catchment area land fund and developing a project for the basin organization of nature use on the catchment area of the river using GIS and RS technologies [66, 67].

The conceptual model of ecologically rational exploitation of the catchment area includes: creation of an ecological frame of the river basin based on the identification of the internal geomorphological structure of the catchment area; the development and filling of the geo-informational and analytical system of the river basin, including the assessment and forecast of the ecological situation and the determination of the most agrogenerically transformed sub-basins of different orders; development of the project of the basin organization of nature use, including the ecological and resource characteristics of the current state of the territory of sub-basins of different orders and the evaluation of the effectiveness of the project implementation.

Rational nature use, based on the conceptual model of ecologically rational exploitation of the catchment area, in addition to optimizing the use of natural resources, should ensure support for mechanisms of their reproduction by searching for optimal scenarios of nature use. They will form the perspectives of effective territorial development and improvement of the hydrogeoecosystem of the river. For this purpose the most promising will be the introduction of a geoinformational analytical system (GIAS) to support basin nature use, which provides the systematization of multi-level and branch information of monitoring observations for organizing soil and water protection measures.

A river basin is an information unit of the GIAS. It is a natural-commercial system in which all types of natural resources use are interrelated.

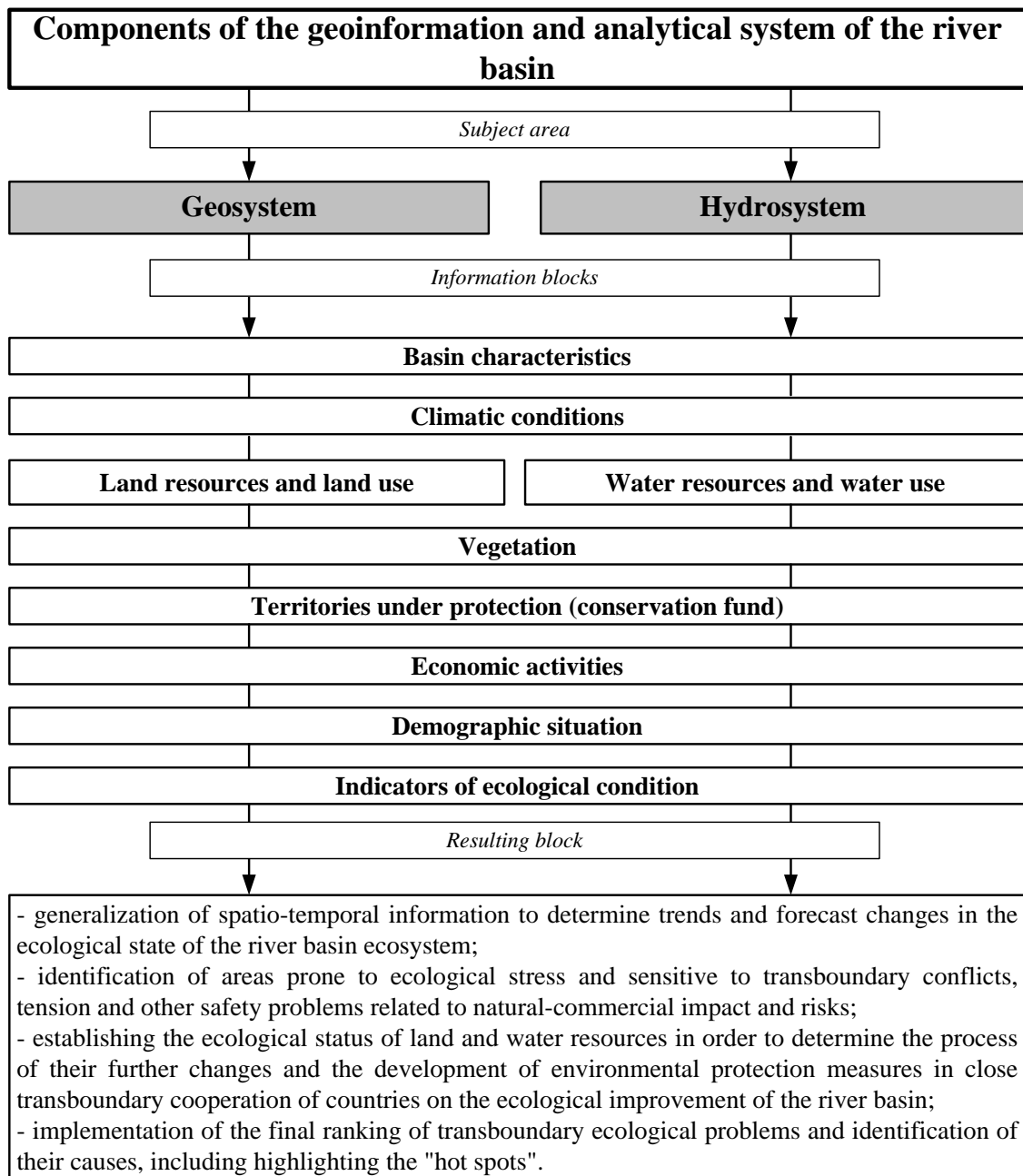
The basin also acts as an integrated natural-commercial-demographic system, which is the most effective object for managing [68].

The creation of an integrated multi-level GIAS of basin nature use should be carried out on the basis of information resources and the interaction of specially authorized coordinating bodies. Structurally designed GIAS is a logical model that includes three subsystems - a database, special software support and an analytical unit. The analytical part is based on a multidimensional relational database that contains subject-oriented information.

The GIAS analytical unit includes methods, algorithms and programs focused on the subject area. Within the framework of the system, two subject areas are considered (Fig. 3), which have the conditional names "Hydrosystem" and "Geosystem". The subject area "Hydrosystem" includes such sections as: hydrogeology (conditions), hydrology (resources), and ecology (quality). The subject area "Geosystem" includes such sections as: conditions (natural potential), resources (characteristics), ecology (quality) in relation to the territorial objects.



For a comprehensive analysis of the ecological state of the river basin in GIAS, it is desirable to single out the following information blocks and indicators: characteristics of the basin (indicators: morphological and morphometric features, administrative-territorial and basin distribution, etc.); climatic conditions (indicators: air temperature, precipitation, climatic energy, etc.); water resources and water use (indicators: hydrological and hydrochemical features, etc.); land resources and land use (indicators: share of the main types of land use, availability of arable land, etc.); vegetation (indicators: natural lands, forests, etc.); territories that are under protection (reserve fund); economic activities (indicators: gross domestic product, demographic load index, etc.); demographic situation (indicators: population density, migration, morbidity, mortality, birth rate, etc.); indicators of the ecological state (indicators: erosion processes, factors affecting the ecological state, etc.).

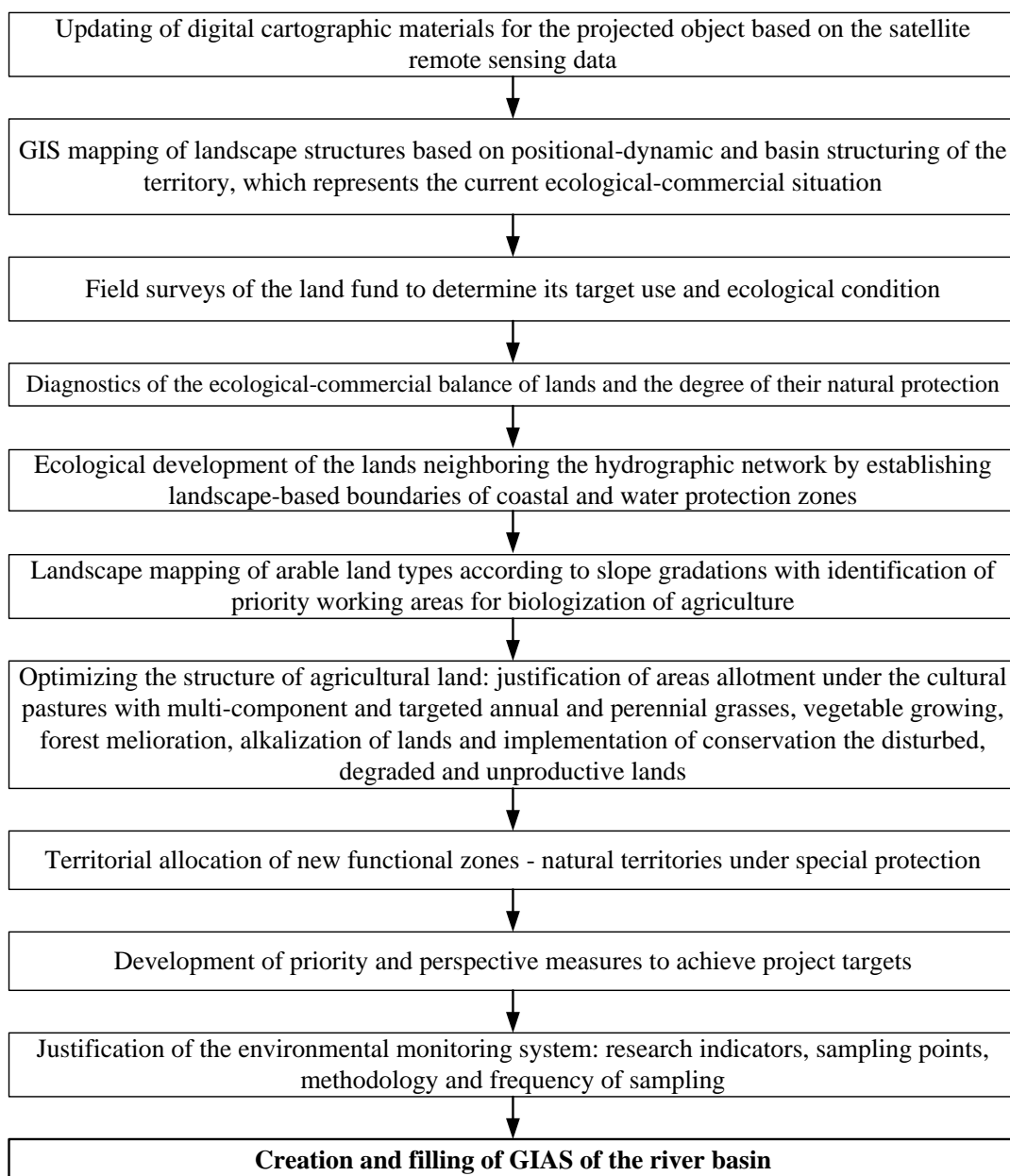


**Fig. 3. Structural scheme of the GIAS of the river basin**

The reorganization of the land structure is the basis for the spatial organization of catchment areas based on basin principles. It is stated in our methodology [69] for determining the structure of the catchment area land fund and developing a project for the basin organization of nature use on the catchment area of the river using GIS and RS technologies. The reorganization should include the following stages: 1 – land management of arable land based on positional-dynamic and basin principles; 2 – projecting of forest plantations; 3 – projecting of water protection zones; 4 – rationalization of fodder lands use; 5 – projecting of recreational areas; 6 – detection of new nature reserves.

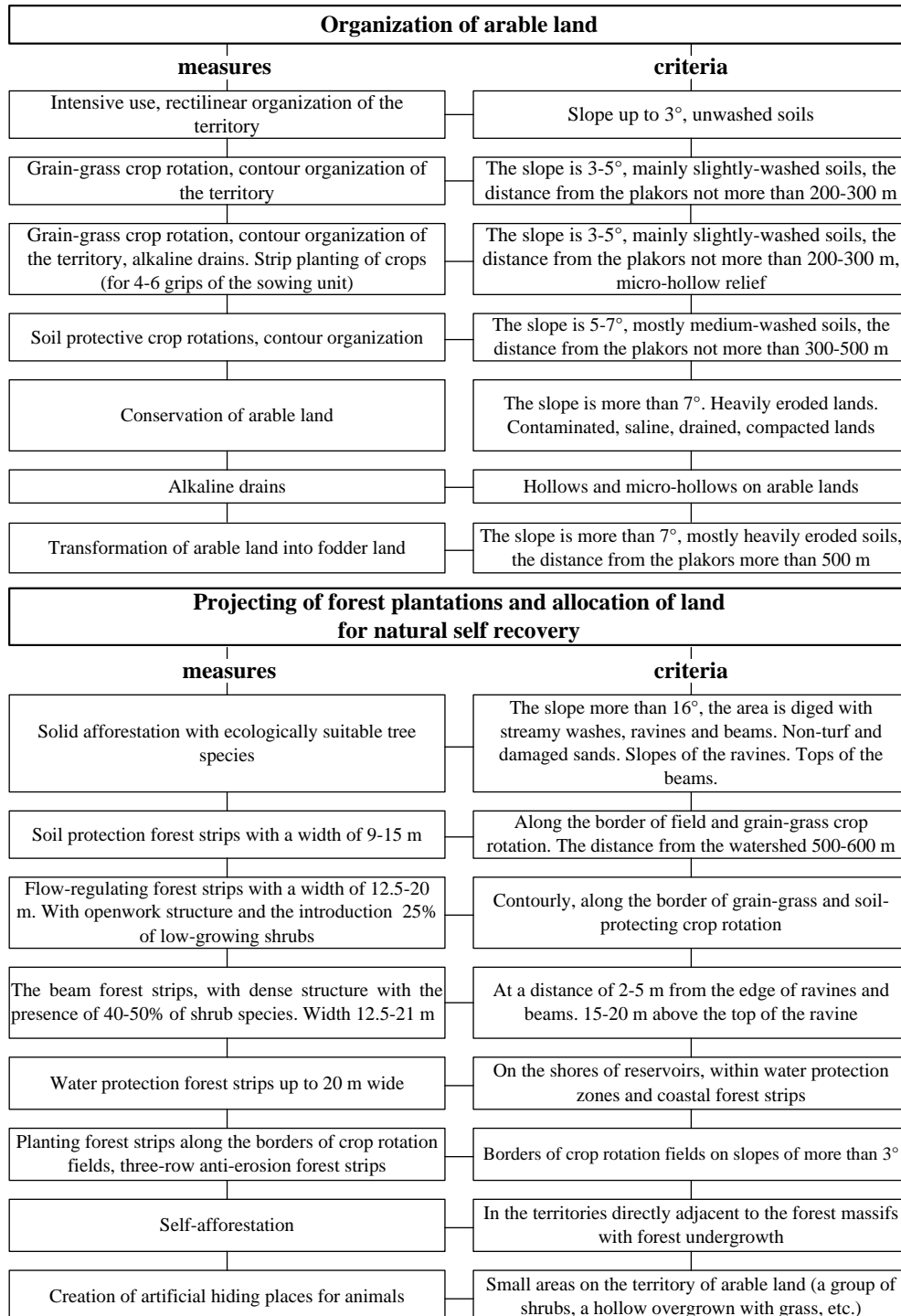
The projects of the basin organization of nature use on the territory of the river catchment area, will analyze the ratio of two main groups of land: commercial use and natural undisturbed complexes or slightly disturbed by human activity, which constitute the ecological fund of lands and perform the most important ecological-biosphere functions, or "ecological services".

For the development of basin nature use projects, successive stages of actions are defined (Fig. 4).



**Fig. 4. Stages of GIAS creation for the development of basin nature use projects**

To transfer the development and implementation of corresponding soil and water protection measures related to arranging the catchment area of the river into scientific-legal plane of nature use organization, appropriate land management actions should be done. They are presented in Figure 5.



**Fig. 5. Criteria and measures of land management works during basin organization of nature use**

During the territorial planning of catchment basins, it is necessary to find a compromise between achieving ecological sustainability of agricultural landscapes and economically profitable intensity of agricultural production with stable harvests. For this purpose, it is necessary to determine the most priority methods of greening of arable land, among which its reduction is an extreme measure.

These methods are presented below in the order of priority of their use:

1. Change a share of stabilizing crop rotations on arable land by increasing the area of perennial herbs. This is the most optimal way to increase the ecological stability of arable land without reducing its area [72].

In the structure of field crop rotation on slopes with a steepness of 0–3°, it is necessary to introduce up to 20% of perennial herbs. On slopes of 3–5°, grain-herb crop rotations are implemented with a share of perennial leguminous-cereal herbs up to 50%, and row crops are not allowed to be grown. The most erosion susceptible areas of arable land on slopes with a steepness of more than 5° must be completely under herbs and soil protection crop rotations.

The use of perennial herbs in crop rotations is aimed at solving several tasks at the same time: accumulating organic substances and increasing soil fertility; decreasing the intensity of water-erosion processes; reduction of the total anthropogenic load on the environment. In addition, the long-term use of perennial herbs will reduce the cost of mineral fertilizers, will lead to a reduction of weeds and the number of harmful insects, as well as will reduce crop diseases.

2. Implementation of agroforest-melioration measures on arable land, such as increasing the share of contour anti-erosion forest strips on slopes. Numerous studies have convincingly proven that under the protection of forest strips, the productivity of arable land increases by 15-30%. The average yield of grain crops under the protection of forest plantations is higher by 18-23%, technical crops – by 20-26%, fodder – by 29-41%. The most stable landscape conditions are formed when the share of agroforest-melioration plantations on arable land is 3.0-3.5% in the Forest-Steppe zone and 3.5-4.5% in the Steppe zone [5, 73].

3. Temporary (revolving) conservation of heavily eroded arable land. Such lands should be transferred to a long-term preservation. The successions that appear on the preserved lands are typical for zonal ecosystems, have a significant resource and biosphere potential and especially important for restoring soil fertility. To form the ecologically stable preservations of lands, it is necessary for them to reach at least 10 years of age, and their premature return to agricultural use will increase their erosional destruction. Spatial identification of such lands is very difficult, but an increasingly promising solution of this task is the use of Earth remote sensing data [74].

4. Transformation of heavily degraded arable land into other types of land. At the same time, the physical and geographical conditions of the territory should be taken into account: for the Forest-Steppe zone - mainly selective afforestation, for the Steppe - transfer to natural fodder areas. On the arable land remaining after reduction, energy and material resources should be concentrated as much as possible for ecologically safe intensification of agricultural production in order to obtain the volumes of products necessary for the sustainable development of the economy of the region and the country.

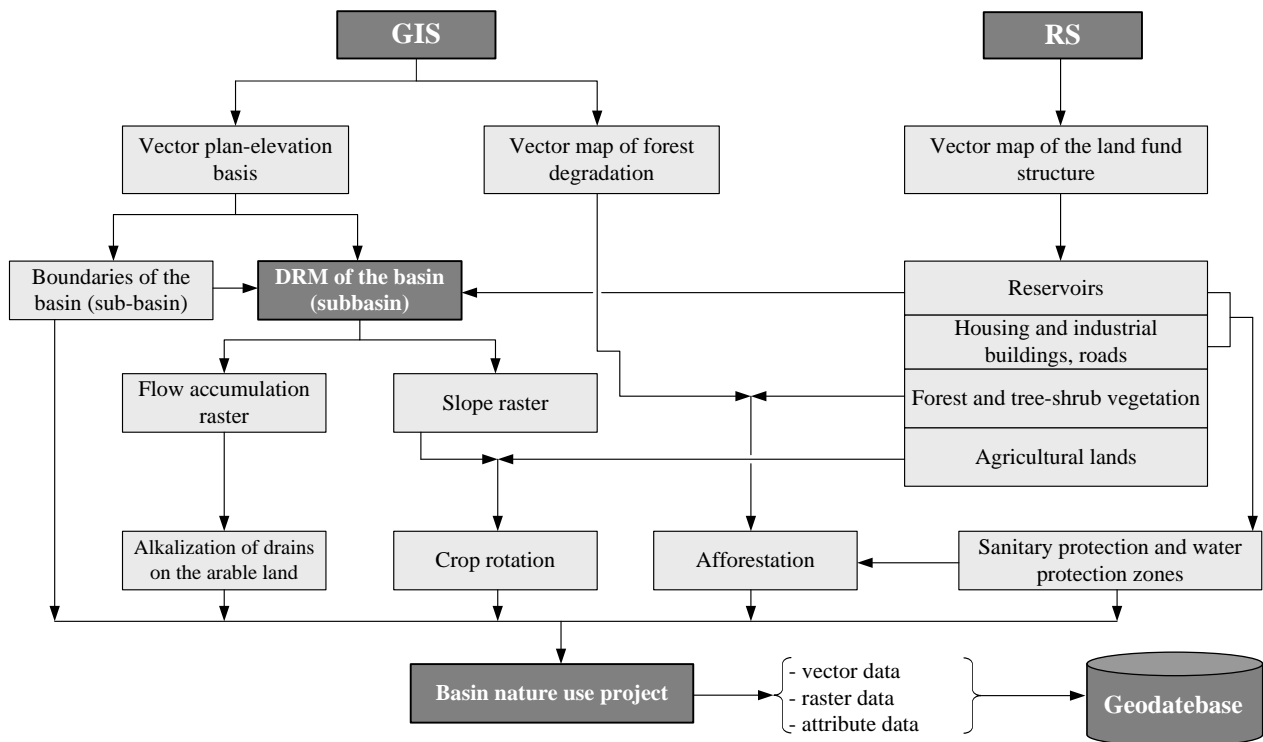
The other way to increase the ecological sustainability of basin landscape territorial structures is the arrangement of natural fodder lands, in particular, the allocation of areas for their natural self-regeneration and the creation of conditions for enhanced reproduction of soil fertility. Natural self-regeneration is planned to be carried out by solid afforestation, planting of forest strips, selection of areas for self-recovery with forest, creation of artificial hiding places for animals. Measures for the afforestation of the territory are carried out by creating different types of plantations and taking into account the high natural ability of deciduous plantations to excrecence from the small forest areas. When projecting afforestation sites, the following techniques are used: solid afforestation of steep eroded slopes; afforestation in the shape of beam forest strips on the border of arable land and fodder land; solid afforestation of the upper part of the beams in the headwaters of rivers and places of accumulation of springs; afforestation of water protection zones of rivers.

Special attention should be paid to water protection forests - forest plantations within the water protection zone prevent pollution, siltation of water bodies and depletion of their waters. The water protection forest is of particular importance in the Forest-Steppe and Steppe zones, where the amount of precipitation is 1.5–1.7 times less than the amount of evaporation. For the purpose of protective afforestation, preference

should be given to fast-growing species so that they begin to perform their water-regulating functions as early as possible such as birch, maple, bird-cherry, green and downy ash, etc.

On arable lands, where there are islands of natural vegetation on unsuitable areas, it is proposed to organize areas with partially artificially thickened vegetation, with a forbidden on livestock grazing and haying, these areas serve as a shelter for wild animals. Areas remote from settlements are assigned for self-growth. These are the headwaters of ravines and beams adjacent to large fore ravines forest strips or forest massifs, and in which there are signs of renewable successions. In some cases, such beams are "framed" by projected additional forest strips to enhance the growth of tree-shrub vegetation.

The development and implementation of appropriate soil and water protection measures for the arrangement of the catchment area optimally should be carried out at the basins of the 5<sup>th</sup>-4<sup>th</sup> orders or lower on the basin positional-dynamic, adaptive-landscape and geosystem principles and carried out in accordance with the algorithm for assessing the state of the catchment area and developing the project of the basin organization of nature use with the help of GIS and RS technologies (Fig. 6).



**Fig. 6. Algorithm for assessing the state of the catchment area and development of the project of the basin organization of nature use with the use of GIS and RS technologies**

The basis for the organization of ecologically rational exploitation of the territory is the results of a complex geomorphological analysis of the studied territory of the basin at the local level. The modern software product ArcGIS is used to carry out this task. The geoinformation system has a wide set of tools and modules for modeling, spatial analysis of processes and phenomena.

Data on the structure of the land fund of the river basin territory serves as the initial information for anti-erosion landscape design. The main source of up-to-date information for geoplanning is remote sensing data from Landsat satellites with a spatial resolution up to 15 meters. The use of satellite photography allows not only to reflect the modern structure of the land fund, but also to trace its dynamics through the time. Based on the remote sensing data, vector thematic layers are created. They can fully reflect the structure of the terrain and are combined into spatial databases or geodatabases. The presence of only the vector data fully allows many analytical procedures: calculation of geometric characteristics (area of polygonal and

length of linear objects), analysis of spatial compatibility by overlay method (overlay analysis), various statistical and geostatistical operations.

Sets of raster data for the operational territorial unit of spatial analysis - the river basin is the basis for anti-erosion soil and water protection projection of the catchment area. This data is obtained on the basis of a digital relief model (DRM). While constructing the DRM, special attention should be paid to the correctness of its hydrological component. First, the obtained DRM must be checked for the presence of local reductions - topological errors that arise due to the peculiarities of the model construction algorithm and can be corrected using the "Fill" operation.

The obtained DRMs are systematized in the catalog of raster data at the local level of GIAS, from which they are available for further analytical operations. The project organizational structure of arable land is developed on the basis of grids of slopes of the earth's surface obtained by spatial analysis of the DRM. The slope cell values are grouped into groups with intervals: 0–3°, 3–5°, 5–7°, more than 7°. The structure and configuration of crop rotations are determined using a semi-automated way by imposing slopes grids and a vector layer of land in accordance with the Table. 1. The projecting of drains calcification is carried out by identifying the talwegs of the fluvial network.

To do this, with the help of the "Gidrology" tool set, rasters of runoff accumulation are created. The places of concentration of water flows are displayed on this rasters. After processing the raster data and converting it into a vector format, an erosion network of beams is obtained, which are recommended for alkalinization.

As a result of the implementation of all spatial operations, geo-informational projects of anti-erosion optimization of the land fund structure are created on the basis of soil and water protection arrangement of territories for each basin or sub-basin. Priority arrangement is carried out in the territories of different level sub-basins with a high degree of agrogenic transformation of landscapes.

The ecological efficiency of optimizing the agro-landscapes of the basin must be evaluated by the ratio of stabilizing and destabilizing lands, expressed through a set of coefficients.

1. Natural protection coefficient ( $K_{NP}$ ) [75] determines the level of resistance of natural landscapes to anthropogenic influences, which depends, first of all, on the amount and nature of the distribution of the lands of the ecological fund: natural biogeocenoses and natural territories under protection:

$$K_{NP} = \frac{\sum S_{SL}}{S}, \quad (1)$$

where  $S_{SL}$  – area of ecological fund lands;  $S$  – the area of the research territory. To achieve a critical level of protection, at least half of the entire land fund should belong to stabilizing landscapes.

2. Sustainability of the agricultural landscape ( $K_{SL}$ ) can be estimated by the ratio of the areas under medium-forming and destabilizing lands according to the formula [76]:

$$K_{SL} = \frac{\sum S_{SL}}{\sum S_{DL}}, \quad (2)$$

where  $S_{SL}$  – area of stabilizing lands;  $S_{DL}$  – area of destabilizing lands.

To favorable ecological sustainability corresponds  $K_{SL} \geq 0,71$ , relatively favorable – 0,70-0,60, satisfying – 0,59-0,56, tense – 0,55-0,46, critical –  $K_{SL} \leq 0,45$ .

Stabilizing elements of the landscape include natural tree and shrub herbaceous vegetation, gardens, fodder lands, part of arable land occupied by perennial herbs, swamps, water bodies; destabilizing – arable land, ravines, landslides, areas under construction and roads, industrial facilities, other areas that have suffered of significant anthropogenic changes.

3. A more detailed assessment of the ecological state of landscapes is given by the coefficient of ecological stability ( $K_{ES}$ ), which takes into account the differentiated contribution of each element of the landscape through a system of coefficients [77]:

$$K_{ES} = \frac{\sum S_i \cdot k_i}{S} \cdot K_{MS} \quad (3)$$

where  $S_i$  – land area of *i-type*;  $k_i$  – coefficient of environmental stability of the land of *i-type* (Table 1);  $S$  – the total area of the assessed territory;  $K_{MS}$  – coefficient of morphological stability of the relief (1 – for stable areas, 0,7 – for unstable areas, for example, sand, landslides, steep slopes).

**Table 1. Coefficients of ecological assessment of lands**

Land type	Coefficient of ecological stability of the land, $k_i$
Built-up territories and roads	0,00
Arable lands	0,14
Vineyards	0,29
Forest strips	0,38
Orchards and shrubs	0,43
Kitchen-gardens	0,50
Hayfields	0,62
Pastures	0,68
Reservoirs and swamps of natural origin	0,79
Forests of natural origin	1,00

If the value  $K_{ES} \leq 0,33$  – the territory is ecologically unstable, 0,34-0,50 – moderately stable, 0,51-0,66 – average degree of stability,  $K_{ES} \geq 0,67$  – the territory is ecologically stable.

### CONCLUSIONS

The justification of the safety of water and land use and the implementation of a conceptual model of ecologically rational exploitation of the river basin territory as an integral positional-dynamic and spatially organized system of interconnected natural-anthropogenic components will allow to optimize the structure of the land fund, reduce the risks of ecological destruction of land and water resources, ensure greening of agriculture and improving of the ecological situation in river basins.

It is emphasized that the conceptual model of ecologically rational exploitation of the basin catchment area includes: creating an ecological frame of the river basin based on the identification of the internal geomorphological structure of the catchment area; the development and filling of the geoinformational and analytical system of the river basin, including the assessment and forecast of the ecological situation and the determination of the most agrogenerically transformed sub-basins of different orders; the development of the project of the basin organization of nature use, including the ecological-resource characteristics of the current state of the territory of sub-basins of different orders and the evaluation of the effectiveness of the implementation of the project. Geoplanning of the structure of the catchment area land fund and development of the project of the basin organization of nature use is carried out using GIS and RS technologies.

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## ECONOMIC ANALYSIS OF THE USE OF ENVIRONMENTALLY SAFE GROWTH STIMULANTS IN THE TECHNOLOGY OF SUNFLOWER CULTIVATION

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### **ABSTRACT**

*The study presents economic substantiation of applying environmentally friendly plant growth stimulators in combination with biological fungicides in sunflower production under conditions of the South of Ukraine. The field research was conducted at Kherson State Agricultural University (Ukraine) in 2016 – 2018 under conditions of dark chestnut alkaline soils with the humus content of 2.5% in the plough layer. The results of the three-year field research prove that the net profit reached the absolute maximum in the variant of the hybrid LG 5580 under conditions of applying the bio-fungicide Fitotsyd-r with the stimulator Ahrostymulin at the stage of budding and amounted to \$1081/ha. In this case the cost price was the least – \$141.6/ha, and the profitability level was the highest – 196%. In the areas sown with the hybrid Tunca the variant with the combination of Fitotsyd-r and the growth stimulator Ahrostymulin also provided a positive result, but it yielded a little to the combination of the preparations Fitosporyn / Ahrostymulin: the net profit was \$579.7/ha, the price cost made \$203.4/ha and the profitability was 106 %. On the whole this analysis makes it possible to maintain that additional costs related to purchasing and applying fertilizers are totally compensated owing to the cost of an increase in the yield.*

**Keywords:** *environmentally friendly fertilizers, sunflower, production costs, product cost, net profit, profitability*

### **INTRODUCTION**

The means of regulation of nutrient content in soils, nutrient intake by plants with different ratio is a system of nutrition regime. It has a radical impact on the level of supplying plants with mineral elements. But practice shows that mineral fertilizers do not solve all the problems related with the optimization of nutrition regime. During their growing season plants are under stress for quite a long time, their nutrition under such environmental conditions becomes less efficient (Jaspers and Kangasjärvi 2010). The task of a farmer is to provide suitable conditions for plants to overcome stress as fast as possible (Rady MM 2012, Hanserud OS et al 2018). There is a number of factors causing stress-reactions of plant organisms during the growing season. By the nature of impact they are divided into chemical (salts, gases, xenobiotics); biological (negative impact of pests, pathogenic agents, competition with other plants) and physical (excess or deficiency of moisture, temperature regime, light and radioactivity) (Whipps JM 1997, Goswami and Deka 2020). Under these conditions it is necessary to apply complex multi-functional fertilizers, containing mixtures of organic, humic and fulvic acids, a number of micro-elements in a chelated form in their formulation causing their fungicide action and activating microorganisms. It ultimately leads to stimulation of growth processes and contributes to the overcoming stress phenomena of plant organisms (Kumar et al 2015, Domaratskiy et al 2018, Domaratskiy et al 2019). The scientific research conducted in North America establishes that plant growth regulators applied in low concentrations are able to affect the division and growth of cells, their structure and functioning (Small and Degenhardt 2018). Direct application of such natural hormones and their synthetic analogs to plant stems, leaves and flowers increases their resistance to biotic and abiotic environmental factors, improves drought-resistance of crops and water-use efficiency (Rostami and Azhdarpoor 2019). The studies show that such fertilizers are capable of increasing nitrogen use efficiency, contribute to an increase in root weight and also stimulate the growth and development of lateral roots, assist in enhancing photosynthesis. These substances are usually applied in agriculture, viticulture and horticulture to increase yields under conditions of low agricultural background, moisture deficit and other unfavorable environmental factors (Siddiqi and Husen 2017, Adnan et al 2019).

Ukraine is one of the leaders in the world export of the products of sunflower processing. The world market expects to receive 5.1 million tons of Ukrainian sunflower oil this season that is by 16% more than

the rate of the previous year. An increase in sunflower concentration in the structure of sown areas to 35% will have a negative impact on productivity that will decrease in all biological and economic groups. The gross yield of grains will fall from 27.0 to 20.9 million tons, and there will be an increase in that of sunflower seeds – from 4.5 to 5.8 million tons. Under such conditions the total cost of gross production of grain and oil crops will fall by \$0.25 billion (from \$3.04 to \$2.79 billion). At first sight the scheme of maximum use of sunflower in crop rotation is not threatening, but this approach is certainly insecure in terms of increasing effect of droughts and spread of specific diseases and pests (Moklyachuk et al 2019). Crop yield stability in agricultural production aimed at meeting demands of a continuously increasing population of the planet is possible only under conditions of applying fertilizers containing basic nutrients for plants. However, the use of such chemical substances has a negative impact on the environment and human health. Therefore, application of micro-fertilizers of biological origin is considered to be the best substitute for chemical fertilizers as an environmentally friendly method of growing crops and increasing soil fertility.

These preparations intensify growth processes of plant organisms by means of different direct and indirect mechanisms of plant growth stimulation such as biological nitrogen fixation, production of various plant growth hormones, different hydrolytic ferments etc. Application of biological preparations increases the potential of vital nutrients supply in appropriate amounts to boost crop yields without damaging the environment (Divjot et al 2020).

Main goal of the chapter is to substantiate an economic component of using environmentally friendly preparations in technological schemes of sunflower production.

## MATERIALS AND METHODS

The field research was conducted in the research field of Kherson State Agricultural University in 2016 – 2018. The soil on the research plots is dark chestnut alkaline. The humus content is 2.5% in the plough layer of the soil, the content of slightly hydrolyzed nitrogen is 35, the content of movable phosphorus – 32 and that of metabolic potassium – 430 mg/kg of the soil. The density of one-meter layer of the soil is 1.35, and its solid phases are 2.66 g/cm<sup>3</sup>, the general porosity – 49–50%. The reaction of the soil solution in the topsoil is close to neutral (pH 7.0). It is alkaline closer to the profile – (pH 7.4 – 7.9). The hydrolytic acidity is 0.36–1.9 mg-eq per 100 g of the soil. The soil permeability for the first hour of absorption is 1.3-2.2 mm/min. Groundwater is deeper than 5 m and does not affect soil-formation processes. The climate is moderate and arid. The average annual air temperature is 10.3<sup>0</sup> C, and accumulation of active air temperatures starts in the 3<sup>rd</sup> decade of March and finishes in the 2<sup>nd</sup> decade of November. The experimental research was carried out by means of a tree-factor field experiment: Factor A – preparations: – control (clean water), Fitosporyn, Fitosporyn / Hart Super, Fitosporyn / Ahrostymulin, FitoHelp, FitoHelp / Hart Super, FitoHelp / Ahrostymulin, Fitotsyd-r, Fitotsyd-r / Hart Super, Fitotsyd-r / Ahrostymulin; Factor B – sunflower hybrids of the company “Limagrein” (Tunca, LG 5580); Factor C – the period of applying preparations (seed treatment, the stage of budding). The seeds were treated according to the research scheme – a day before seeding, the plant treatment – at the stage of budding (9–10 pairs of true leaves). The plots were placed by the block-splitting method. The exchange rate of the NBU was 1\$ – 24.32 UAH.

## RESULTS AND DISCUSSION

Application of bio-preparations is related to the necessity of increasing production costs and bio-fertilizers are substances with a low selling price. The calculation of the cost of fertilizers for treating sunflower seeds and plants is given in Table 1.

**Table 1. Calculation of the cost of fertilizers (prices on January, 1<sup>st</sup> 2019)**

Fertilizers	Market price, US dollar/L	The dose of the fertilizer		The cost per 1 ha, US dollar	
		Per 1 t of seeds, 1	Per 1ha of crops, 1	Seed treatment	Plant treatment
Fitosporyn	6.6	0.15	0.4	0.1	2.6
Fito Help	15.8	0.8	0.5	1.2	7.9
Fitotsyd-R	13.2	0.15	0.3	0.2	3.9
Hart Super	33.7	0.02	0.8	0.1	26.9
Ahrostymulin	79	0.02	0.2	0.2	15.8

It is necessary to add the cost of the crop treatment to the obtained results. Spraying the crops with 200 l/ha of the treatment solution costs \$11.5/ha. Therefore, the total costs of applying Fitosporyn will be \$14.1/ha; Fito Help –\$19.4/ha; Fitotsyd-R – \$15.4/ha. The stimulators were applied with bio-fungicides, therefore there were not additional costs. The main aim of economic evaluation is to compare the product cost and production costs (Table 2).

**Table 2. Sunflower product cost depending on bio-fertilizers ( average for 2016-2018)**

Fertilizers	The period of applying	Tunca			LG 5580		
		Productivity, t/ha	The cost of 1 t of seeds, US dollar	The product cost, US dollar/ha	Productivity, t/ha	The cost of 1 t of seeds, US dollar	The product cost, US dollar/ha
Control (clean water)		2.26	419.7	948.6	2.8	419.7	1179
Fitosporyn	seeds	2.4	419.7	1007	2.9	419.7	1200
	budding	2.5	419.7	1070	3.3	419.7	1406
Fito Help	seeds	2.4	419.7	1020	2.9	419.7	1196
	budding	2.5	419.7	1057	3.4	419.7	1423
Fitotsyd-R	seeds	2.3	419.7	982	2.9	419.7	1221
	budding	2.4	419.7	1003	3.4	419.7	1422
Fitosporyn / Ahrostymulin	seeds	2.5	419.7	1049	3.3	419.7	1376
	budding	3.0	419.7	1267	3.6	419.7	1532
Fitotsyd-R / Ahrostymulin	seeds	2.5	419.7	1049	3.4	419.7	1439
	budding	2.7	419.7	1125	4.0	419.7	1632

The calculation of the product cost with the determination of quality indexes was done for the sunflower with the fat content of 48%. This result was provided by the laboratory of the LLC “Nibulon”. If oil fat is lower by 1%, the price will be lower by  $1/48 \cdot 100 = 2.08\%$ , and vice versa, the higher oil fat content is, the higher the price will be. But currently there is not such a system, therefore we used one price for all cases – \$419.7. An important element of economic analysis is the calculation of direct production costs. At first, according to the regulations, we calculated the total costs for growing, harvesting and transporting sunflower products and additional costs related to purchasing and applying fertilizers, and also, to harvesting and transporting additional products. The seed cost of the hybrids Tunca – \$131.6 per the sowing unit and LG 5580 – \$135.8 per the sowing unit are also referred to the difference in the costs. The production costs of the variants in the experiment were equal to \$508.9/ha. In our further calculations we added the cost of addi-

tional expenses, mentioned earlier, to this sum. Thus, the level of the costs for each variant of the experiment is the following (Table 3).

**Table 3. Level of the direct production costs for sunflower depending on the hybrids and fertilizers (average for 2016–2018), US dollar/ha**

Fertilizers	Periods of application	Tunca				LG 5580			
		Total costs	Purchasing and applying fertilizers	Additional harvesting	In total	Total costs	Purchasing and applying fertilizers	Additional harvesting	In total
Control (clean water)		508.9	-	-	508,9	510.6	-	-	510.6
Fitosporyn	1*	508.9	0.1	6.0	515,0	510.6	0.1	10	520.7
	2*	508.9	14.1	12.3	535,3	510.6	14.1	14.6	539.3
Fito Help	1	508.9	1.2	5.1	515,2	510.6	1.2	8.3	520.1
	2	508.9	19.4	13.0	541,3	510.6	19.4	16.5	546.5
Fititsyd-R	1	508.9	0.2	5.3	514,4	510.6	0.2	7.7	518.5
	2	508.9	15.4	13.9	538,2	510.6	15.4	17.3	543.3
Fitosporyn / Ahrostymulin	1	508.9	0.28	15.9	525,08	510,6	0.28	16.7	527.6
	2	508.9	29.9	18.1	556,9	510.6	29.9	21.1	561.6
Fititsyd-R / Ahrostymulin	1	508.9	0.37	15.1	524,37	510.6	0.37	19.7	530.7
	2	508.9	19.4	16.7	545	510.6	19.4	20.8	550.8

: 1\* – seed treatment; 2\* – plant treatment at the stage of budding.

The difference in the direct production costs between the control and the research variants reaches the maximum of \$459.6 per hectare in the hybrid Tunca, and \$5.1 per hectare in the hybrid LG 5580. It is worth noting that we calculated only direct production costs without considering the overheads: salaries for managers, tax payments, advertising, sales etc. (Table 4).

**Table 4. The basic economic indicators of sunflower production with application of bio-preparations (the average for 2016-2018)**

Fertilizers	Periods of application	Tunca					LG 5580				
		Production costs, US dollar/ha	Product cost, US dollar/ha	Net profit, US dollar/ha	Product cost price, US dollar/ha	Relative level of profitability, %	Production costs, US dollar/ha	Product cost, US dollar/ha	Net profit, US dollar/ha	Product cost price, US dollar/ha	Relative level of profitability, %
Control (clean water)		508.9	948.6	438.4	225.2	86	510.6	1179	668	181.7	131
Fitosporyn	seeds	515.1	1007	492.3	214.6	96	520.7	1200	679.7	182.1	131
	budding	535.5	1070	534.8	210.1	100	539.4	1406	866.7	161.0	161

Fito Help	seeds	515.3	1020	504.6	212.1	98	520.1	1196	676.1	182.5	130
	budding	514.4	1057	516.3	214.8	95	546.5	1423	876.4	161.2	160
Fitotsyd-R	seeds	514.5	982.2	467.6	219.9	91	518.5	1221	702.9	178.1	136
	budding	538.4	1003	464.7	225.2	86	543.4	1422	879.5	158.9	162
Fitosporyn / Ahrostymulin	seeds	525.2	1049	524.1	210.0	100	527.6	1376	849	160.8	161
	budding	557.0	1267	710.5	184.4	127	561.5	1532	970.4	153.8	173
Fitotsyd-R / Ahrostymulin	seeds	524.5	1049	524.8	209.7	100	530.7	1439	908.9	154.7	171
	budding	545.1	1124	579.7	203.4	106	550.8	1633	1081	141.6	196

The investigation of the degree of impact of these factors on economic efficiency is a complicated but a very important stage in the development of every enterprise in particular and Ukraine AIC on the whole. Examining the experience of agricultural activity and the level of profitability of agricultural production we maintain that it is necessary to create a correlation and regression model of profitability of sunflower production with application of bio-preparations. The data of the field research for 2016-2018 was used to conduct this research and create the model. The developing multiple regression taking into consideration the profitability of sunflower production Dependent variable was used to determine the profitability of sunflower. This index was chosen because it reflects efficiency and appropriateness of agricultural activity. In order to create a multi-factor correlation and regression model we suggested using three independent variables:  $X_1$  – productivity, c/ha (an indirect index of soil fertility),  $X_2$  – production costs (US dollar per hectare),  $X_3$  – the price of the products sold (US dollar for 1 centner) (an indirect index of product quality). The multiple regression was performed on the basis of the data of the field research conducted in the research field of Kherson State Agricultural University in 2016 – 2018. The model of the multifactor linear regression was created by means of the statistical method for measuring correlations (correlation and regression analysis). To calculate the correlation coefficient the following formula is used (by the example of calculating the correlation  $x_2y$ ):

$$r_{x_2y} = \frac{x_2y - \bar{x}_2\bar{y}}{\sigma_{x_2} * \sigma_y}$$

The calculations of the correlation coefficients (the matrix of the pair correlation) are given in Table 5. The proximity of the correlation coefficients to 1 between some factors indicates to a strong connection between them or its multiplicative character.

**Table 5. Matrix of the pair correlation**

Tunca	y	$x_1$	$x_2$	$x_3$
y	1	0.962	0.837	0.671
$x_1$	0.962	1	0.833	0.847
$x_2$	0.837	0.833	1	0.602
$x_3$	0.671	0.847	0.602	1
LG 5580	y	$x_1$	$x_2$	$x_3$
y	1	0.988	0.270	0.821
$x_1$	0.988	1	0.367	0.899
$x_2$	0.270	0.367	1	0.584
$x_3$	0.821	0.899	0.584	1



Considering the values of the matrix of the correlation coefficients can draw a conclusion that the most significant factors affecting profitability are the following: productivity, the price of the products sold and production costs. The initial factors were the ones having the coefficient of the pair correlation within the range of 0.4 to 0.9. The profitability of sunflower was chosen as a dependent variable, productivity per hectare, production costs and the price for 1 t were chosen as independent variables. First of all, assumed that correlation of the dependent variable with other variables is linear, i.e.

$$Y = a_0 + a_1x_1 + a_2x_2 + a_3x_3$$

Unknown coefficients are determined by means of the method of least squares the essence of which is to minimize the sum of the squares of the deviations of the actual data from the theoretical data, obtained by the regression equation. The minimization criterion looks like this:

$$S = \sum (y - y_p)^2 \rightarrow \min .$$

Considering the function S as the function of the parameters  $a_0, a_1, a_2$  and making mathematical transformations (differentiations), we have a system of equations:

$$\frac{\partial S}{\partial a_i} = 0, \quad i = 0, 1,$$

Transforming this system, we have obtained a system of normal equations for the stage of seeds. Solving it we find necessary coefficients. On this basis we have obtained the function for Tunca and LG 5580 :

$$Y = 48.507 + 63.369x_1 - 0.0041x_2 - 0.005x_3$$

$$Y = 117.977 + 77.83x_1 - 0.017x_2 + 6.84x_3$$

The most complicated step is interpreting the equation, i.e. translating it from the language of statistics into the language of economics. The regression coefficient – the parameter  $a_0$  is a reference point in the model on the diagram of the correlation field; the parameters  $a_1$ - $a_3$  show how the values of the dependent variable change on the average when the independent variable increases by the unit of its measurement. The more the value of the regression coefficient is, the more considerable impact this factor has on the dependent variable. The sign before the regression coefficient indicating to the character of the impact on the dependent variable has special importance. The coefficient of  $x_1$  is equal to 77.83. It means that the dependent variable will increase by 77.83% when the productivity increases by 1%, the profitability will increase by 0.017% when the production costs per 1 t decrease by 1% and the profitability will increase by 6.84% when the selling price increases by 1%. Therefore it is necessary to check the adequacy of this model. The following variants are possible.

- This model is adequate on the whole on the basis of checking it by the F-test of Fisher, and all the regression coefficients are significant. Such a model can be used for making decisions and creating forecasts.

- The model is adequate by the F-test of Fisher, but some regression coefficients are insignificant. In this case the model is suitable for making some decisions, but it is not good for creating forecasts.

- The model is adequate by the F-test of Fisher, but all the regression coefficients are insignificant. Therefore the model is considered as totally inadequate. The coefficient of multiple correlation is 0.97, indicating that there is correlation of the dependent variable with the independent variables. But we cannot draw conclusions about the adequacy of the model on this basis.

The checking the adequacy of the model with testing the significance of each regression coefficient was done by means of Student's t-test:

$$t_p = \frac{|a_i|}{\sqrt{\sigma_{a_i}^2}}, \text{ ac } \sigma_{a_i}^2 = \frac{\sigma_y^2}{k}$$

The coefficient of the model will be considered as statistically significant if  $t_p \geq t_{kp} = 0.619$ . The calculated  $t_{pi}$  are equal to 2.107; 35.589; -0.222; -0.601 respectively, i.e. only  $a_1, a_2$  meet the requirements of signi-

ficance. By the F-test of Fisher we obtained  $F=45.12$ . Comparing it with the Table value of the Fisher-Snedecor distribution (F-distribution)  $F > F_{Table}$ , where  $F_{Table}=2.99$  with the degree of probability of 95%. It proves that the model is adequate by the F-test of Fisher. The average approximation error  $\varepsilon = 1.068\%$ , though it should not exceed 12-15%. The coefficient of multiple correlation is rather high, the model is adequate on the whole on the basis of checking it by the F-test of Fisher, and all the regression coefficients are significant. The average error does not exceed the established norm. Therefore, such a model can be used for making decisions and plans or creating forecasts.

## CONCLUSIONS

The main indicator of economic suitability of this or that measure is a net profit. Neither cost price, nor profitability, but a net profit determines the real difference between the product cost and the level of production costs. For three years of the field research this indicator reached the absolute maximum in the hybrid LG 5580 when the bio-fungicide Fitotsyd-r and the stimulator Ahrostymulin were applied at the stage of budding, and it made \$1081. In this case the cost price was the least – \$141.6, and the level of profitability was the highest – 196%. The variant with the combination of Fitotsyd-r / Ahrostymulin also provided a positive result in the hybrid Tunca, but it yielded a bit to the combination of the preparations Fitosporyn / Ahrostymulin, and the net profit was \$579.7, the cost price – \$203.4 and the profitability – 106 %. On the whole this analysis makes it possible to receive evidence that additional costs, related to purchasing and applying fertilizers, are compensated by an increase in the yields.

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## THE POTENTIAL OF THE EMOTIONAL INTELLIGENCE AS MODERN COMPANY'S COMPETITIVE ADVANTAGE

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### **ABSTRACT**

*The article analyses the concept of "emotional intelligence", reveals the need for its assessment by the company's staff and consideration for employment. The socio-psychological research in this area were studied, an analysis of the influence of the emotional intelligence level on the employee's performance was carried out, the experience of foreign companies in using the emotional intelligence factor in their activities was considered. It has been proven that at present, companies of the fourth level of maturity with the highest financial performance, which have made a bet on emotional intelligence, firstly, have a highly effective potential for recruiting and hiring personnel, including such emotional and psychological characteristics as ambition, learning, passion, and purposefulness. Secondly, they acquire a competitive advantage in the new market conditions associated with global technological challenges and business process management in the context of digitalization and Industry 4.0 in general.*

**Keywords:** *emotional intelligence, behavioural model, artificial intelligence, digitalization, innovation.*

### **INTRODUCTION**

The modern corporate behavioural model is largely based on understanding the essence of emotional intelligence (EI), which is especially relevant today and corresponds to such features of the "digital economy" as: a) the increasing role of innovation in business management, b) reducing the direct interaction between producers and consumers, c) expanding the use service models of business management, d) concentration of financial activities on separate global economic platforms. On the one hand, we are talking about well-designed and implemented new business management models, including technological business processes that allow for rapid response and forecasting of upcoming challenges and problems. On the other hand, it's about the features of the implementation of innovative strategies that directly depend on the stage of the company's life cycle and the company's behaviour model in the relevant market conditions, its response to changes in the external and internal environment, the nature of marketing activities in the context of digital business transformation.

### **METHODS**

The multifactorial theory of intelligence was developed by Thurstone (2014), who singled out 10 groups of factors, 7 of which he identified and called "primary mental abilities": S - spatial (the ability to operate "in the mind" with spatial relationships); P – speed of perception (the ability to detail visual images); N – numerical (ability to perform basic arithmetic); V - verbal comprehension (the ability to reveal the meaning of words); W – verbal fluency (the ability to quickly select a word according to a given criterion); M – associative memory (ability to memorize); R - general reasoning or induction (the ability to identify patterns in a series of letters, numbers, shapes). He proved that IQ cannot be used alone to describe individual intelligence. Many studies, which are reflected in the works of Daniel Goleman (2005), Travis Bradberry and Jean Greaves (2009) testify that, firstly, a high level of EI allows an individual to develop more productively both in personal and professional plans, manage stress and build effective communication. Secondly, the ability of an individual to be aware of emotions contributes to the development of his/her thinking through the understanding of emotions and, accordingly, the ability to manage them in the context of intellectual growth.

The main goal of this study is to identify the need for an EI assessment in the formation of the intellectual potential of the company and the transformation of the latter into a competitive advantage. To achieve the goal, the following **tasks** were set: to consider the concept of EI and its types, as well as the degree of importance of this factor for increasing labour productivity; to highlight the areas of work that EI affects to a greater extent, including the selection and hiring of employees for work; to classify modern methods of assessing EI as a company's competitive advantage.

## RESULTS

Today, most companies are gradually changing the model of a bureaucratic corporation to an innovation hub, opening digital departments, and attracting specialists from different other departments to innovative projects that work for results. At the same time, Industry 4.0 forms a new ecosystem of scientific, technical, industrial, social, environmental relations based on the digital transformation of business, using nano-, bio-, info- and other cognitive technologies. However, the analysis of modern advanced corporate innovation practices shows that, in addition to knowledge and previous experience, the most important creative element of the innovation process is non-standard creative thinking. The definition "curse of knowledge" means previous experience based on the internal activities of the staff, blocking the ability to see a fundamentally new - in modern conditions it is acquiring a truly fundamentally new connotation. The sphere of activity of companies is narrowing, which, in pursuit of short-term financial results, simply limit the resource support of their own large-scale innovation programs. At the same time, on the one hand, they must adapt to new challenges - abandon the usual foundations and principles, learn new things, and constantly experiment. On the other hand, by making mistakes and at the same time learning from them, cultivate a corporate credo - "the journey has no destination, and it never ends", which is the basic principle of modern innovation management and intra-company innovation strategy.

Today, the "rules of the game" of labour market actors have changed significantly, job security has ceased to exist, and academic knowledge or technical abilities are only the initial requirement for employment. The leadership qualities of innovation management today include flexibility, initiative, optimism, adaptability to change and empathy (the ability to empathize and put yourself in the place of another individual, to understand and feel what another individual is experiencing within his own system of views). At the same time, modern innovative inventions in companies fundamentally change the approach to work based on the search for the best ways to organize production processes - the search for the necessary adaptation process is a critical condition for companies to maintain and strengthen corporate competitive advantage. There is a gradual transition in the formation of strategies from "catching up" adaptation (repetition of existing experience, which, as a rule, does not provide a significant long-term competitive advantage, but only the opportunity to "stay afloat") to "leading" adaptation. We are talking about the company's ability not so much to adapt to changes and market requirements as quickly as possible, but to become the source of such changes itself. This implies, firstly, the coordination of innovation and project management processes and their interaction with innovation ecosystems. Secondly, constructive prototyping of pioneer innovations through the search for new ideas (acceleration programs, holding hackathons and competitions, buying start-ups, etc.) in conjunction with all corporate control functions in the organization.

In retrospect, there are now many examples of companies investing heavily in innovative research and development, resulting in irreparable losses, and when firms invested insignificant resources, but then profits exceeded all expectations.

Today EI is the ability to recognize one's own and other people's emotions, as well as manage them, and if IQ is intelligence and analytics, then EI is the ability to get along with oneself and others. In fact, EI is "the ability to control one's own and others' feelings and emotions, to distinguish them and use this information to control one's thinking and actions" (Mayer, Roberts & Barsade, 2008). Such emotional awareness gives the individual the ability to control his emotions and apply them in accordance with the set goals. According to recent studies, developed EI contributes to the personal and professional success of a person by 80%, while

the level of rational intelligence (IQ) is only 20%. Thus, EI is ultimately the ability to successfully apply mental abilities and effectively interact with the conditions and requirements of the market. It consists of a mass of different qualities (self-awareness, empathy, patience, tact, optimism, openness, sincerity, etc.), but the following EI factors are fundamental: 1) self-regulation (SR); 2) regulation of one's own emotions, mood management, blocking of negative emotions, control over emotions; 3) relationship regulation (RR); 4) social skills, the ability to build relationships with others; 5) reflection (R); 6) self-awareness, rational understanding of emotions, identification of one's own motivations; 7) empathy (Emp); 8) understanding the emotions and feelings of others, decentration. With pairwise grouping of factors, we obtain two main blocks of EI: behavioural - SR + RR; cognitive – R + Emp (Caruso & Salovey, 2004).

Individuals with a high level of EI, firstly, have a clear understanding of what is happening to them at a particular moment and can analyse their emotional state. They can identify not only their feelings, but also their shades: "fear - nervousness - anxiety", "anger - indignation", "shame - guilt - embarrassment", "resentment - annoyance - irritation". Secondly, they have high self-confidence and are realistic about the manifestations of their emotions; thirdly, they successfully regulate the manifestation of their emotional states, restrain themselves from impulsive actions and quick decisions; fourthly, they have the ability to reduce the degree of anger or anxiety, switch and increase their internal and external mood; fifthly, they know how to show empathy, perceive emotional signals and messages from others, build effective relationships with partners.

Moreover, at work, they easily cope with leadership positions and problems associated with the people around them, it is easy for them to cooperate with "problem" personnel.

In modern conditions, EI is especially important when stressful situations occur in a professional context, especially regarding conflict situations, unexpected changes, and difficulties in adapting to them. Thus, over the past 20 years, the Mayer-Salovey-Caruso (2000) EI model (ability model) has been actively used, which consists of four EI components: 1) perception of emotions - the ability to recognize emotions (by facial expressions, gestures, appearance, gait, behaviour, voice) of other individuals, as well as to identify their own emotions; 2) the use of emotions to stimulate thinking - the ability of an individual (mainly unconsciously) to activate his thought process, to awaken creativity in himself, using emotions as a motivation factor; 3) understanding of emotions - the ability to determine the cause of the appearance of an emotion, to recognize the connection between thoughts and emotions, to determine the transition from one emotion to another, to predict the development of an emotion over time, as well as the ability to interpret emotions in relationships, to understand complex (ambivalent, ambiguous) feelings; 4) management of emotions - the ability to tame, awaken and direct their emotions and the emotions of other individuals to achieve their goals. This component also includes the ability to take emotions into account when building logical chains, solving various practical problems, making corporate decisions, and choosing one's own behaviour.

However, today the most popular is the so-called mixed model of Daniel Goleman (2005) with its four components of EI, according to the book: a) self-awareness (awareness and analysis of one's emotions, weaknesses and strengths of one's own personality); b) self-control (the ability to manage emotions and maintain emotional balance in force majeure situations); c) empathy (understanding the emotions of others and taking into account their states); d) relationship skills (correct communication associated with the ability not to provoke conflicts, work in teams and be a leader). According to TalentSmartEQ, 90% of successful leaders have a high level of EI, and according to the Brighton School of Business and Management, EI at work is twice as important as hard skills, and 44% of employees surveyed consider this indicator to be the hallmark of effective leaders (Alyoshina, 2021).

According to recent studies (Zall & Kangavari, 2022), an individual with a high level of EI can, firstly, cope with pressure and stress from work, as well as effectively manage himself and others during negotiations, and there is a direct relationship between how developed EI among managers, and how they manage

people (recognition of both stressful situations not only in themselves, but also in employees, and negative emotions, the right reaction, which helps to avoid stress, anxiety and depression, the ability to resolve conflicts, etc.). Secondly, to get what is necessary from colleagues and earn their respect (understanding one's own emotions is adequate to the ability to manage them, and therefore, to simplify building relationships with others; the higher the EI level of the staff in the remote team is, the higher the quality of communication will be). Thirdly, to motivate the team based on an understanding of feelings and emotions, which increases the likelihood of non-impulsive decision making with meaning and understanding of current and future corporate goals. Currently, various concepts and models of EI are being actively developed - this is how business intelligence, spiritual intelligence (spiritual intelligence) and social skills (any competence that simplifies interaction and communication with other employees, the ability to create and develop relationships, as well as verbally and non-verbally communicate). At the same time, the properties of manager-leaders are analysed, which determine the success and effectiveness of projects, in which the result largely depends on communication, and the emotional state corresponds to their goals and objectives. At the same time, emotional and intellectual processes are interdependent in the context of many complex tasks from different areas. An attempt to digitize human emotions, create the most objective test (as they did with IQ) and change EI is the MSCEIT (The Mayer-Salovey-Caruso Emotional Intelligence) method, which consists of 141 questions (the subject is shown pictures with emotions that need not only identify, but also explain).

Nowadays the practice of using modern EI models in the field of recruitment is especially popular, which is still associated with a situation where 80% of decisions are made intuitively. Companies spend 40-60% of their revenue on payroll, and most of this huge amount is the result of managerial decisions that are made only based on intuition. One study showed that most hiring managers make judgments about a candidate within the first 60 seconds of a meeting, often based on the candidate's appearance, handshake, clothing, or speech.

This raises a logical question: "What features, experience, education and individual character traits guarantee success in hiring?" Managers and HR professionals spend billions of dollars developing assessments, tests, simulations, and games used in recruitment, but many argue that despite this, in 30-40% of cases, candidates are selected incorrectly (Yva.ia, 2021). Therefore, the number of employers is rapidly growing, who cite the "emotional intelligence" of the future employee as the reason for hiring staff. In the end, it is he who becomes the decisive factor, instead of such commonly used terms as, for example, character, personality, maturity, comfort in communication or the pursuit of excellence. Indeed, the efficiency of business processes, the assessment of risks associated with the employee's behaviour at work, as well as the emotional atmosphere that he will bring to the team and even the company's reputation depends on the correct choice of a new employee. In most customer-driven companies, EI is a major hiring factor, as it is for leadership positions in any field. Although EI as a criterion for hiring began to be used relatively recently, many foreign companies, for obvious reasons, immediately adopted it. Such world-leading companies as McDonalds, Coca-Cola, Apple, PWC, NEC, Walmart and others use assessment centres (group discussions and role-playing games with additional interviews after exercises), special EI tests at the interview stage to assess the EI of employees. The most popular metrics are the Goleman, Hall, TTI, Ryback, Meyer-Salovey-Caruso test. The impact of the "human factor" on business processes and results is a measurable category, since it is quite possible to calculate how much a low EI employee will "cost" a company, as well as what benefits the company receives from a high EI employee.

Today, according to surveys of company personnel, 67% of the abilities that helped them achieve excellence in their work are related to emotional competence, and, in addition to IQ or job requirements, two out of three indicators related to the general behavioural skills of the employee. At the same time, according to employers, an important role is played by: listening and communication skills; the ability to adapt to change and cope with setbacks; confidence, motivation, desire to move up the career ladder; the ability to work collaboratively with others and resolve differences; desire to contribute to business development or

become a leader. A recent survey by the popular CareerBuilder website found that employers tend to assign EI scores higher than IQ scores when hiring staff for the following reasons: 1) as tasks become more complex, teamwork becomes more valuable; 2) a smart worker who is impossible to work with is useful only in a narrow area of work; 3) an intelligent person who does not know how to cope with stress harms more than helps; 4) the more there are potential opportunities for growth in the company for candidates, the more emotional stability is required (Gopinath, Ramamoorthy & Kalpana, 2020).

Companies that work in accordance with EI models receive significant benefits, employees carry out business processes more efficiently, and their productivity improves significantly. EI is important for managers and owners of companies since the possession of its skills helps to establish feedback with the staff. We are talking about the syndrome of "emotional burnout", which consists in a feeling of depletion of energy and an increase in mental distance from work, a cynical and negative attitude towards one's professional duties, as well as a decrease in productivity. The American Gallup Institute organized a study among 7.5 thousand workers and found that 23% of them suffer from "burnout at work" constantly, and 44% - from time to time. However, if EI models are actively involved, then such risks can be prevented or at least reduced (Koroleva, 2022). According to a study by the Brighton School of Business and Management, 90% of successful company managers have a high level of EI, which is twice as important as hard skills at work, and 44% of employees surveyed consider this indicator to be the hallmark of effective leaders. According to the report of the World Economic Forum, since 2019, EI has been included in the top 10 skills of the "human of the future" until 2030 (Alyoshina, 2021).

High EI is also included in the profile of the position of top managers and middle managers. For working specialties, the minimum level of EI is sufficient. A study of 515 executives by Egon Zehnder International shows that high EI executives are 74% successful at work and only 24% unsuccessful. To assess EI, categories of personnel are identified and the concept of EI is translated into specific competencies with appropriate indicators: a) line personnel (sales assistants, cashiers) - are aware of their emotions, recognize the emotions of others and identify their needs, are open to various norms / rules and act accordingly ; b) specialists (merchandisers) - analyse their feelings and emotions, know ways to minimize destructive emotions, offer others help and support; c) manager - identify and respond to tension between team members, show interest in the work and life of their subordinates (Majeed & Jamshed, 2021).

That is why EI corporate assessment and development programs are a turn of the organization towards the hired personnel of the company, understanding and strengthening the relationship between individual success and business success.

There are two main approaches to measuring EI: 1) definition using "objective" tests, consisting of tasks with one correct answer, by analogy with traditional IQ tests; 2) determination using questionnaires. The main difficulty of the test approach is the lack of convincing grounds for determining the correct answer, and the main drawback of surveys is the reliance on self-report, which conflicts with the attempt to measure EI as one of the types of IQ. The third approach is a non-test method for estimating EI based on the 360-degree technology, which is as follows. As you know, cross-evaluation (when everyone in a group of subjects is asked to evaluate everyone) can be carried out according to various criteria that will show how "emotionally smart" the figure being evaluated is in relations with people who are directly around him. Today, in Western companies, EI is measured mainly with the help of psychological testing, which consists of 70 questions and takes about 40 minutes in total. The results are given on the following scales: "Behaviour", "Knowledge", "Emotional penetration into oneself", "Motivation", "Expression of emotions", "Empathy and social intuition" with a detailed description of each factor. At the same time, the behavioural aspect of EI characterizes how a person is perceived by others, as well as the ability of a person to control his emotions in behavioural reactions (Dhani & Sharma, 2016).

It should be noted that despite the general preoccupation with professional skills (software skills, sales skills, math skills, etc.), most companies tend to conclude that technical skills are only a small percentage of success. So, in parallel with the measurement of EI, algorithms based, firstly, on artificial intelligence, are



widely used today, which helps to study resumes, find suitable candidates within companies, identify highly effective employees, and even give a transcript of interview video, choosing specialists who, most likely to be the most successful. Secondly, based on the principles of gamification applicants are screened for vacancies in marketing and sales. At the same time, AI technologies allow solving HR tasks at almost any stage of an employee's life cycle, including salary formation, staff training, goal setting and performance assessment, career development, culture, and engagement management, etc.

Eliminating all mistakes made in the interview process and reviewing the "track record" of candidates that are made in the current process, the success rate is increased by more than 30%. Already, AI tools (HeadHunter, CleverStuff platforms, etc.) make it possible to increase the speed of resume processing by 94% (algorithms select potential employees based on formal features: education, competencies, track record analysis) (Afroz, Firoz & Pandey, 2017).

It is known that more than 200 billion US dollars are annually invested in the global learning and development industry, but at the same time, most experts in the field of training argue that at least half of these funds were spent in vain (the developed solutions are forgotten, inappropriately or are simply a waste of time), and on average, employees of companies are allocated less than 25 minutes per week for training. The need to study and implement the best work algorithms into the practice of the company is based on tracking the potential of knowledge, behaviour, and actions of the most effective employees (including project teams as a whole). For example, the Degreed platform, on the one hand, allows a company to select advanced training courses for staff based on the competencies and career ambitions of employees.

On the other hand, it helps the employer to identify the potential of employees and, if the company focuses on a new field of activity, not to hire new people, but to train existing staff. Similarly, the EdCast platform works, the purpose of which is to retain highly qualified employees within the company (by offering them career growth through training). The digital library of the system brings together the experience of specialists from different business sectors, allowing the employer to choose exactly those courses that meet his goals, and the use of Netflix-like algorithms makes learning as useful and fun as watching cable TV. Therefore, even considering that on average, employees have less than 25 minutes a week for training, if this time is spent with greater benefit, the effectiveness of each of them will increase. Moreover, the use of such tools, according to available studies, increases the effectiveness of company management in the context of strengthening and developing corporate values by at least 25% (including the use of EI models) (Dust, 2018).

Indeed, EI, spiritual intelligence and social skills models are actively used by businesses today, but also it has become clear that instead of teaching this to adults, it is necessary to teach new generations who will know from the very beginning how to control their own emotions, how to communicate in a team, be more responsive with friends and acquaintances and be able to express their feelings. These skills are no less important than the ability to solve mathematical problems or study foreign literature. Today, in many countries, the concept of EI is gaining its popularity.

## CONCLUSIONS

Developed EI skills, firstly, contribute to the creation of a more productive and motivated working environment in the company, and the developed potential of EI opens up huge opportunities - its high level in the workplace improves self-control, helps to strengthen confidence in decision-making (today EI is even more important for achieving commercial success than IQ). Secondly, it is the ability to use emotions and to manage them, to see motivation and real interests, and the management of companies with developed EI is more productive in the context of staff motivation. Thirdly, they are highly valued when hiring and become an important factor in the performance of staff, which affects relationships not only in the work area, but also in the private life of the individual, making people more focused, stress-resistant and more self-confident. Currently, on the request "IQ tests", network search engines will give a million results, but if the effectiveness of these tests can be challenged, then the current realities indicate that intelligence alone is not

enough, the significance of EI is undeniable. The ability to mentally solve a complex equation or calculate a percentage is productive, but EI and the ability to manage emotions are often more important than mental abilities. Today, companies do not need to analyse personal data to evaluate the effectiveness of employees - they use data within corporate resources for descriptive and predictive behavioural HR analytics, the EI model, while respecting the principle of employee confidentiality.

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## THE MAIN TRENDS IN THE DEVELOPMENT OF SOCIAL MOBILITY AS A RESULT OF SOCIAL MANAGEMENT

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### **ABSTRACT**

*The study of the phenomenon of social inequality goes beyond the analysis of income inequality and indicators of its current state. Existing and new forms of inequality will determine the living conditions of modern society and future generations. Undoubtedly, social inequality has mainly a financial basis, but it is necessary to take into account the process of its translation to other aspects of social life. The formation of social security under the conditions of the new reality is carried out under the influence of the emergence of new and aggravation of existing threats, which are increasingly difficult to predict, prevent and solve in a timely manner. At the current stage, under the conditions of a war state in Ukraine, a significant increase in the flow of internally displaced people, an increase in the number of citizens of our country who have lost housing, property, and work, the problem of social inequality is becoming more acute and requires considerable attention from the state and the public. In this regard, social management in the country begins to play a leading role and gain importance. The impact of social inequality on the state of social security of society is confirmed by the results of a survey of experts.*

**Keywords:** *social inequality, social security, society, citizens, the problem of social inequality, injustice, income.*

### **INTRODUCTION**

Inequality is inherent to all types of human society. Even in primitive societies, where there is no property difference, there is inequality between different individuals, between men and women, between young and old, etc. As already noted in the study above, inequalities lead to social stratification, divisions. Those in a privileged position try to maintain their advantages, while those in a lower position want to change it for the better. Today, in our country, the institutional structures and regulatory framework for regulating the formation of socialization of the economy are not aimed at observing social justice, which limits the potential for effective economic growth.

Taking into account the full-scale war, the significant increase in the number of people with the status of "internally displaced people", "displaced people", and the increase in the level of financial burden on the state budget, state targeted social funds, forecasts for the coming year 2023 are not optimistic. Population differentiation is growing, and management methods are only adapting to new conditions.

### **LITERATURE REVIEW**

The relevance of the problem of social inequality is confirmed by the significant scientific output of scientists: S. O. Makeev[1] , R. B. Marutya [2] , E. M. Libanova [3], I.D. Popova [7], V.P. Nedashkivskyi [7], A.H. Arsenko [9], M.T. Sidorzhevskyi [11], H.O.Uzhmajuridze[12], O.O. Chuprina[13], etc., as well as strategic directions approved by the United Nations and other international and national organizations, in particular, the development of sustainable development goals has become a new strategic opportunity to move the problems of inequality and social justice to the center of regional, national and global development strategies and priorities. Nevertheless, the topic of social inequality continues to be relevant and debatable and needs further research and development.

The purpose of this study is the development of scientific and methodological provisions of social inequality of the population in the context of the impact of social inequality on public administration in the country. The search for sources of overcoming the phenomenon and manifestations of social inequality. The topicality of the topic is due to the need to solve an extremely important problem of modern Ukrainian society - increasing social tension, which is caused by the deepening of social inequality in our country, the

emergence of new forms of inequality among its citizens, which are manifested in the unequal access of Ukrainians to various social resources.

Among them: unequal access to quality secondary and higher education; unequal opportunities for realization in the professional sphere; unequal access to segments of the labor market that provide high-paying and prestigious work; unequal access to employment in general and employment "at will"; unequal opportunities to create one's own business; unequal access to power, to political participation, participation in the management of local communities; unequal opportunities to travel abroad (for temporary work, study, etc.); unequal access to the consumer market; unequal opportunities for quality rest, use of expensive recreational facilities; unequal access to quality medical services; unequal opportunities to ensure personal safety and the safety of one's family, including unequal access to means of personal protection (firearms, etc.); unequal opportunities to use IT, Internet resources, digital inequality; unequal access to cultural resources (theaters, museums, other cultural institutions); unequal opportunities regarding environmental safety, including access to environmentally friendly food products; inequality of opportunities related to language competences, etc.

## RESULTS

Poverty and social inequality are a direct consequence of state policy and ideological principles that govern power structures. They are overcome long and painfully. The concepts of "inequality" and "injustice" should be distinguished. Inequality is a socially conditioned and necessary condition. Injustice is a manifestation of selfish interests, and it is destabilizing in nature. Injustice is harmful both to society as a whole and to a specific person [2,11]. But there are many opportunities to change the state of things, including social status, opportunities, income level. And here it is worth mentioning the concept of "social mobility". Social mobility is the transition or movement of an individual from one social position to another. There is constant horizontal and vertical movement of individuals and social groups in society. P. Sorokin is considered to be the founder of the theory of social mobility.

By social mobility, the scientist understands any transition of an individual or a social object from one social position in the social space to another [1, p.111]. According to Sorokin, social space (the concept of "social space" means primarily the social structure of society) has two main classes of coordinates — horizontal (for example, social groups of Catholics, democrats, industrialists) and vertical (for example, a bishop is a parishioner, a party leader is an ordinary member parties, the manager is a worker), which are parameters of the social space. Therefore, there are two main types of social mobility: horizontal and vertical [12,p.78-184,13].

A social subject can advance both within the limits of one and the other parameter, and therefore there are two main forms of social mobility: horizontal; vertical.

Horizontal social mobility means the transition of an individual (social object) from one social group to another located at the same level (for example, from one citizenship to another, from one family to another, from one organization to another, etc. d.) [3].

In particular, according to the preliminary calculations of the Opendatabot platform, in total, during the period from 2011 to 2021, almost 3.3 million citizens left Ukraine, and thus changed their status. According to the spokesperson of the Polish Office for Foreigners (UDSC), Jakub Dudziak, more than 300,000 Ukrainian citizens received temporary (up to three years) and permanent (5-10 years) residence permits in Poland. On July 20, 2022, Ambassador of Ukraine to Poland Andriy Deshchytsia reported that about 1.5 million Ukrainians live and work in Poland. At the same time, about 600 thousand Ukrainians officially pay taxes to the social insurance fund of Poland. That is, a significant number of Ukrainian citizens choose to change their status, or, as mentioned above, horizontal social mobility occurs, which is often associated with a keen sense of social inequality in Ukraine, the search for a "better life", a higher level of income and quality of life .

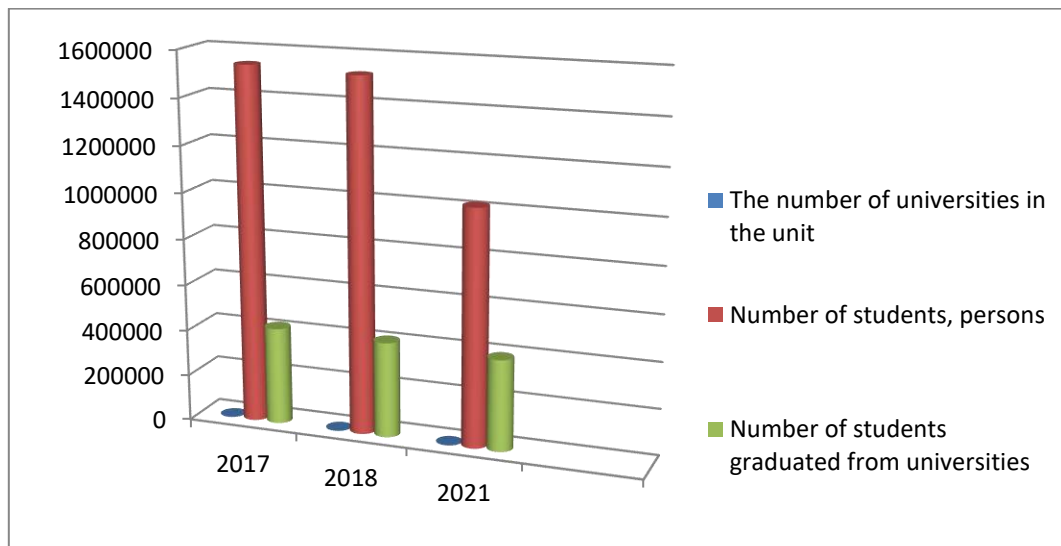
Also, according to the migration service, it is known that more than 400,000 work visas were issued to Poland in the first half of 2021, and only 500,000 for the whole of 2020 [4,5]. Vertical social mobility refers to relations that arise when an individual (social subject) moves from one social stratum to another. For example, we will consider and analyze the vertical variant of social mobility: obtaining the status of "student" by citizens, using the example of changes in the field of education in the Table 1.

**Table 1. Monitoring indicators of changes in social status for the period 2017-2021**

№	Indicator	2017	2018	2021
1	The number of universities in the unit	661	652	450
2	Number of students, persons	1539000	1522000	1020000
3.	Number of students graduated from universities	421000	413000	395600

Source: based on [5]

Thus, we can see that in Ukraine, at the beginning of the 2018-2019 academic year, there are 652 higher educational institutions, in which 1.5 million students study, which is nine fewer than a year ago - 661,000 higher education institutions according to the results of a study by the State statistics service, Fig. 1.



**Fig. 1 Monitoring indicators for vertical social mobility**

Source: based on [5,6].

According to the statistics office, the number of students who received higher education in these institutions was 1522 thousand, which is 17 thousand less than at the beginning of the 2017-2018 academic year (1539 thousand).

In 2018, the country's higher educational institutions graduated 413,000 specialists, which is 8,000 people (2.0%) less than in 2017. Therefore, about 2% of citizens, due to various circumstances, compared to the previous year, did not take advantage of the opportunity to change their social status. As a rule, taking into account the acquisition of the status of "university student", we are talking mainly about young people [5].

Let us remind, according to the data of the State Statistics Service, the size of the existing population of Ukraine during January-October 2018 decreased by 187.9 thousand people. According to the estimate of the statistical office, the number of available population in Ukraine as of November 1, 2018 was 42,198.5 thousand people. Let us note that in 2018, Ukraine took 50th place out of 157 in the new Human Capital

Index of the World Bank. The Human Capital Index is part of the Human Capital Project. It estimates the future amount of human resources (knowledge, skills and health) that children born today will have by the time they reach 18 years of age. The index includes such data as child mortality, number of years of education and its results. This also indicates the negative dynamics of the standard of living of the population of Ukraine [5].

On October 1, 2021, in Ukraine, according to the data of the National Agency for the Quality of Education, there were more than one million students of higher education with the degrees of "Junior Bachelor", "Bachelor", "Specialist" and "Master", this is stated in the annual report of the National Agency for Quality Assurance of Higher Education for 2021. According to the report, in one year (compared to October 1, 2020), the number of students decreased by 3.5%, that is, by almost 37 thousand people [5].

The vast majority of students obtain higher education at the "bachelor" level - almost 720,000 people. The second largest number of recipients is a master's degree - more than 300,000 people [5]. In addition, it is known that slightly more than a third of students (36.2%) obtain higher education at the expense of state or local budgets. Compared to last year, the balance remained practically unchanged (there is an increase in the specific weight of state employees by 0.6 percentage points).

These indicators indicate that the decrease in the number of those wishing to obtain the status of students in 2021 is not related to the income indicator, but rather to the loss of the social value of such a status [5,6].

The indicators of the selected educational programs in 2021 serve as characteristic indicators for the analysis of social mobility, namely: the distribution of applicants by specialty shows that the following specialties are the most popular: 081 Law (74.7 thousand applicants, 7.27% of the total number), 222 Medicine (63 thousand / 6.13 %), 014 Secondary education (59.25 thousand / 5.76 %), 073 Management (52.6 thousand / 5.12 %), 035 Philology (41.9 thousand / 4.08%), 053 Psychology (33.1 thousand / 3.22%), 122 Computer Science (32.3 thousand / 3.14%), 051 Economics (26.55 thousand / 2.58%), 072 Finance, banking and insurance (25.3 thousand / 2.46%), 226 Pharmacy, industrial pharmacy (21.6 thousand / 2.11%). In general, this picture repeats the indicators of 2020 [4,5,6]. So, according to the population, and in particular the youth of Ukraine, as of the beginning of 2022/2023, the most prestigious and highly paid specialties are law, medicine, secondary education and management. Although, such specialties as computer science, economics, and finance do not submit positions.

Depending on the direction of movement, there are, according to P. Sorokin, two types of vertical mobility: upward and downward, in modern terminology, respectively, social ascent and social degradation.

Rising and falling currents exist in two forms:

- penetration of an individual from a lower layer into a higher one;
- the creation of a new group by individuals and the penetration of the whole group into a higher social stratum[7, p.124-184].

Thus, vertical mobility is the starting point of the social stratification of society, because we recall that Sorokin distinguished three types of it: economic, political and professional.

As a rule, it is public organizations and trade unions that are formed to gain opportunities to influence public opinion, to provide assistance in changing status to persons who need it. The monitoring of the creation of such organizations is shown in the Table 2, the dynamics of formation in Fig. 2.

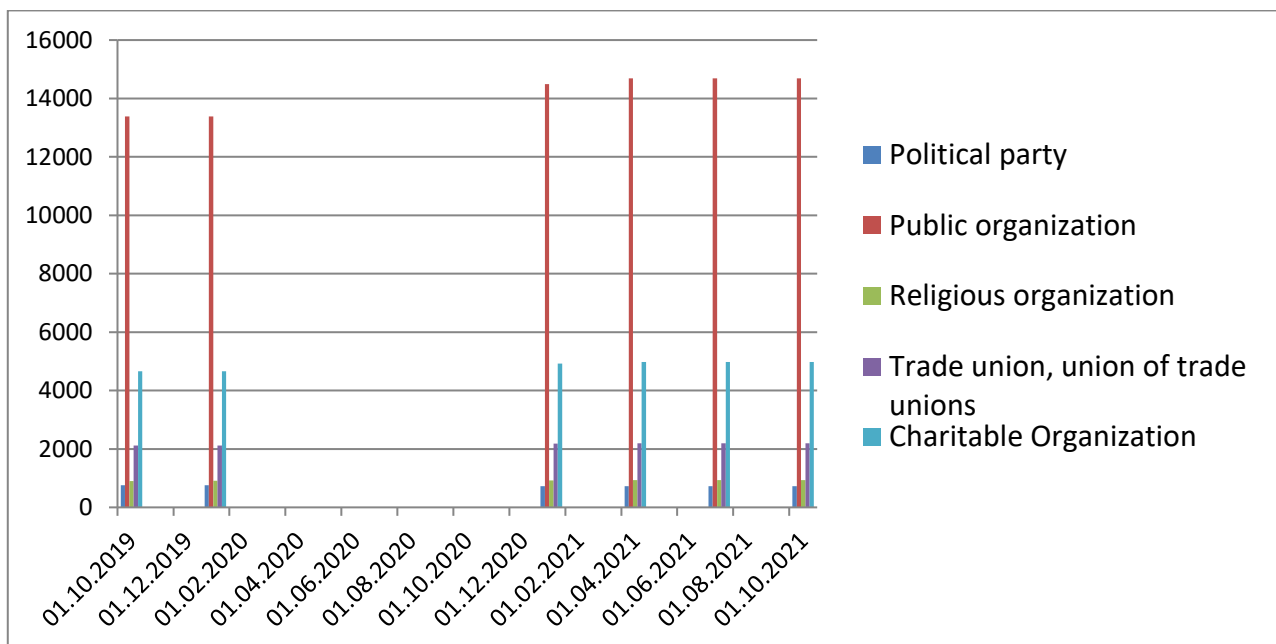
**Table 2. Monitoring of the creation of public organizations, unions, political parties and charitable organizations for the period 2019-2021.**

№	Indicator	As of			As of		
		01.10.2019	01.01.2020	01.01.2021	01.04.2021	01.07.2021	01.10.2021
1	Political party	753	753	723	723	723	723
2	Public	13381	13381	14492	14690	14690	14690

	organization						
3	Religious organization	905	910	926	929	929	929
4	Trade union, union of trade unions	2116	2116	2180	2190	2190	2190
5	Charitable Organization	4658	4658	4920	4978	4978	4978

Source: based on [5].

Since vertical mobility is observed in any society, and between layers there must be some ways by which individuals move up or down from one layer to another, according to P. Sorokin, there are channels of social circulation, the most important of which the scientist considers the following: the army, church, school, political, economic and professional organizations. Recently, intergenerational mobility has also been distinguished, the essence of which is a change in the social position of children in relation to their parents, as well as mobility within one generation, which is associated with the individual's personal success or his fall down the social "ladders".



**Fig. 2. The dynamics of the formation of separate organizations that ensure vertical mobility**

Source: based on [5].

Studying the parameters of intergenerational mobility is very important for establishing the factor of openness — closedness of society. In closed societies, intergenerational mobility is almost inadmissible, because there are rigid barriers between strata that are very difficult to overcome. Such societies, based on the theory of E. Giddens, include slaveholding, caste and state societies [12,13]. As for a class society, intergenerational mobility is very common in it, since moving from one social group to another is open and desirable. However, as P. Sorokin points out, revealing the basic principles of vertical mobility, there are no completely closed societies that would not allow vertical mobility at all, and there are no completely open societies [8].

Among the factors of social mobility that have already been pointed out, sociologists include such as:

- professional training,



- system of social organization (open or closed type of society),
- belonging to political parties, to new religions,
- different birth rate in different strata.

To overcome the cultural barrier and the communication barrier, there are the following methods (or channels), which individuals resort to in one way or another in the process of social mobility:

- a change in lifestyle, in particular, the adoption of a new material standard that would contribute to the assimilation of a new status level (equipment of an apartment, purchase of a car, cottage, etc.);
- the development of typical status behavior - such that would contribute to the acceptance of the individual into a higher social-class stratum. For example, a graduate student, gradually becoming a professor, or a performer, transforming into a company director, must change his behavior in order to be accepted in a new environment. Clothing samples, verbal turns, manner of communication, forms of leisure - everything is subject to review;
- a change in the social environment, which involves establishing contacts with individuals of the status stratum in which a mobile individual is socialized;
- marriage with a representative of a higher status stratum (apparently everyone remembers the rapid vertical mobility of Cinderella to the highest strata of society) [9,11].

So, the concept of social mobility turns out to be an extremely important characteristic of society. According to its criteria, it is possible to compare different types of society from the point of view of the dynamism or obscurity of its social structures, to introduce the concepts of open or closed society, democratic or totalitarian regime, etc.

The consequences of social mobility (positive, negative) are reflected both on individuals and on society as a whole. Advancement is closely related to political development, intellectual and scientific progress, formation of new values and social movements.

Movement down leads to the release of higher layers from less useful elements. But the most important thing is that increased mobility contributes to the destabilization of society in all its parameters. Another possible result is the displacement of the most capable members of society from the process of mobility or beyond the boundaries of this society as such, which inevitably reflects negatively on the fate of society itself. The possibility or impossibility of overcoming the instability it causes depends on one or another society's reaction to the consequences of mobility.

## CONCLUSIONS

In the years that have passed since the declaration of Ukraine's independence, the former egalitarian society has changed into a society with a very high degree of inequality - in terms of income, access to basic social services (informational, communicative, educational, medical, social, etc.), health status, by the risk of death and life expectancy, by the conditions and quality of life, by the position on the labor market.

Unfortunately, state policy, in particular regarding redistribution of income, on the one hand, and financing and management of the social sphere, on the other, has proven to be insufficiently effective in reducing inequality. In modern scientific research, inequality is interpreted as unequal access to the resources necessary to meet human needs.

The more limited resources are in society, the more manifestations of inequality will arise in different planes - from status characteristics to geographic ones. Social inequality has political and economic aspects. The political aspect determines people's unequal access to social freedoms and rights (limited participation in elections, judicial proceedings, segregation, etc.), the economic aspect is related to the process of income distribution, inequality of opportunities, discrimination in employment, etc. The pursuit of equality, which is usually associated with justice, is almost always accompanied by a decline in economic efficiency. Any economic system faces the problem of choosing between the market distribution of income, which is adjusted by the state, or the state distribution of income, which is adjusted by the market.

In order to achieve social justice, it is not necessary to destroy market relations. It is necessary to set reasonable parameters for the distribution of resources (in particular, property) to the market, to introduce progressive taxation on the final incomes of economic entities. The result of this should be the optimal use of resources and the achievement of social justice desired by society. Overcoming inequality based on the application of the principle of justice is not only a social problem, but also a moral one. With such an expanded interpretation of justice, the concept of inequality should be interpreted not only through the prism of social practice, but also political ethics, the priority of which is humane treatment of people. The context of this conclusion is important because it develops a different, compared to the liberal point of view, view of social policy related to value orientations of equality.

However, inequality is not only a product of the market mechanism, but also a necessary condition for its functioning, creation and maintenance of an effective system of motivation and investment. However, unregulated property differentiation is not a sign of a civilized society and a welfare state. It should be within reasonable limits so as not to turn into a factor of social destabilization. State regulation of socio-economic processes plays a significant role in this.

Solving the problem of social inequality of the population is possible through social dialogue. In Ukraine, the use of social dialogue mechanisms has a systemic nature, primarily in the field of contractual regulation of collective labor relations, where a structured multi-level model has been formed and functions on a parity basis, which ensures the conclusion and implementation of collective agreements and agreements by social partners at the national, sectoral, territorial and local levels on a tripartite or bilateral basis.

Mechanisms of social dialogue have been legally defined and formed, which open up wide opportunities for stimulating investment in human capital, which makes it possible to consider social dialogue as one of the effective tools for balancing the interests of all strata of the population, regulating relations in society, in particular with regard to solving the problem of reducing social inequality.

The important role of social dialogue is determined by the national practice of legislative regulation of the basic components of labor relations, in particular on issues of remuneration.

State policy in this area is based on the regulation of minimum social standards, the definition of framework obligations, while specific quantitative parameters should be established through the use of social dialogue mechanisms - during the conclusion of collective agreements and agreements of various levels. In our opinion, one of the effective mechanisms for reducing social inequality is the use of mechanisms of social dialogue (collective negotiations, consultations, exchange of information, joint decision-making, application of conciliation procedures, etc.) when determining minimum standards of labor remuneration.

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## GLOBAL PROCESSES AND BUSINESS MANAGEMENT ON THE BASIS OF PARTNERSHIP

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### **ABSTRACT**

*Global transformations have a significant impact on approaches to business management and orientations in the development of society. Peculiarities and priorities in the development of spheres and branches of the economy, interaction and partnership are related to the mental characteristics and structure of the national economy, the level of its resource intensity and readiness for the introduction of technological solutions. The competitive advantages of the countries of the world at the global level are determined by the technological readiness of business and financial opportunities that allow the implementation of the applied aspect of scientific developments and modern business trends. The partnership itself stimulates the implementation of the set tasks and allows to distribute not only the results, but also the responsibility and potential risks among the participants, including international partners. The choice of a business model depends on the goals, tasks and interests of the participants, and competing positions are opportunities that are realized by joint efforts and taking into account the established priorities, the conditions formed and the ability to quickly adapt to global changes.*

**Keywords:** globalization, technological competition, industrial competition, global partnership, priorities.

### **INTRODUCTION**

Modern world processes reflect the strengthening of the influence of negative factors on all spheres of the economy, small and, especially, large business. The strengthening of influence is due to a number of objective and subjective factors that adjust the processes in the world economy and global society. In May 2022, another meeting of world leaders took place at the World Economic Forum (World Economic Forum) in Davos "History in Reverse: Politics, Governments and Business Strategies" [1]. In view of the increase in global threats, the leaders of the governments of the world were focused on determining the main priorities for leveling threats: global pandemic, military conflicts, geo-economic disturbances, climate change, possibilities of adaptation to social threats, the need for retraining of personnel according to the needs of employers, as well as aspects of effective partnership. A significant emphasis of the meeting was placed on the prospects of global business based on sustainable development.

Effective partnership in the global world is a prerequisite for defining and implementing priority development tasks, adapting the world economy to changes, and adjusting tasks that will ensure the leveling of threats at the global, regional, and local levels. It is the global trends in the development of the world that prove the need to change and adapt mechanisms of interaction both from the point of view of public safety and from the point of view of adaptation to the changes that are taking place. World leaders at the World Economic Forum (World Economic Forum) in Davos-2022 prioritized the main world trends regarding global partnership, climate change, social development, the needs of the health care sector due to the pandemic, business development in view of technology and innovation, the prospects of the world economy and orientation towards a fair economy [1].

An important aspect of the global development of the world is the provision of opportunities in the implementation of joint tasks in order to reduce the level of threats in various spheres and branches of the world economy and the priorities of the formation of a fair economy, which was determined at the World Economic Forum. At the meeting of world leaders in 2022, it was stipulated that only by working together, there is an opportunity to restore trust. The relevance of the issue is enhanced by the impact of the pandemic, which over the past three years has significantly changed the approaches to conducting modern business and the response of world governments to public dangers from Covid 19. Klaus Schwab, founder and President of the World Economic Forum, noted that there is a need to create an atmosphere of trust, which is necessary

to accelerate joint actions and solve numerous problematic aspects that the world is currently facing [1].

The relevance of the issue of global partnership is confirmed by the theme of the G7 meeting in 2022. The summit discussed issues related to food security, neutralization of military threats, energy security, fight against hunger, climate change, as well as geopolitical aspects of the countries of the world. The main thesis of the meeting in 2022 was the focus on unity and coordination of actions in various spheres of global business and interaction. In 2022, the leaders of the "Big Seven" agreed to attract 600.0 billion US dollars of private and public investment for the needs of developing countries, with the aim of limiting the influence of China and stopping the growth of food and energy prices in the world.

The issue of food and energy security remains key due to its significant impact on the development of the world economy, states and regions of the world, the neutralization of threats of a social nature, namely hunger, migration, diseases, social disturbances and military conflicts. The topics of the forums reflect current issues related to the management of modern business and the formation of prerequisites for ensuring sustainable development in view of the existing threats at the local, regional and global level. The issue of information regulation and control remains relevant, as noted by most of the leaders of European states. The World Economic Forum held in Davos in 2021 proved the need for further research and the identification of current directions for neutralizing threats that may arise in society due to the spread of internetization in spheres and industries, the global society. Such issues are annually on the agenda of meetings of world leaders due to the growing level of dependence of world society on artificial intelligence, in the context of the dissemination of information, promotion of information, its protection and changes with regard to certain groups of users, interested persons, groups of persons, as well as the activities of information corporations and their subsidiaries in countries around the world.

Various informal educational activities aimed at understanding the essence of artificial intelligence, its possibilities and potential threats are taking on a larger and larger format. The importance of dependence on the digital space has been greatly spread due to the pandemic (Covid-19), which since 2019 has forced humanity to reduce close communication and spread the use of appropriate digital technologies for the transmission of various information, cooperation and social processes. Remote communication technologies have become a part of everyone's life. The question of the convenience of Internetization and the threat of information, technologies, and the rate of spread of the field of artificial intelligence remains relevant. The development of quantum informatics is active, which proves the experience of the development of this field in the USA and China, as well as the development of business in the field of robotics.

The information environment and means of disseminating information through various types of technology are the need of the hour, but also a threatening trend. The world-famous American BigTech corporations — Google, Apple, Facebook, Amazon — at the forum in 2021 faced a reaction to their activities from representatives of the leaders of the European Union: "Companies should not have such independence, influence and scale".

A decision was announced, which provides for the allocation of funding and the development of strategic transformations in the EU in order to develop and implement various digital projects. In order to protect its own interests, the European Union is trying to create an alternative to the BigTech group — Google, Apple, Facebook, Amazon.

At the level of the European environment, it was announced the need to form an appropriate list of digital market rules, and relevant legislative acts were adopted, which will have an impact on all digital market participants and partners (regarding digital services, digital markets). Attention to this issue at the World Economic Forum in Davos proves the need for further research and the implementation of practical directions for the protection of an individual, territory, group of persons, strata of the population, society, and business.

The tendency to spread "dubious news" and related information through various means of its transmission is also threatening. Dissemination of such information may have a certain interest of individuals or groups of individuals. The scale of such manifestations in global society has increased tenfold only in the last

5-7 years. The European environment is trying to protect the information field and the information and psychological safety of the population, therefore it is actively introducing measures to prevent and neutralize information risks (deceptive or dubious nature of news, misleading or dubious information), primarily through strengthening control over information, increasing the level of responsibility for provided, published, disseminated information, as well as through raising the level of awareness and understanding of information through the education of adults and their acquisition of competence in the field of soft skills.

## METHODS

Aspects of business management in the global world were and remain relevant, the threat of processes and phenomena involves joint resolution of issues on the basis of interaction and effective partnership, which is proven by the experience of joint meetings at the World Economic Forum and other international and regional events. The issue is gaining particular relevance due to the strengthening of the level of competitive industrial and technological struggle between the United States and China. Global business opportunities are focused on the main trends of their interaction and the demands of the modern world.

Vlasov V. [3], Vlasyuk O., Goncharenko S., Golovchenko G., Ivanov V., Ivanova T., Sribna I., and Bulger M. investigated issues of the global world, the development of the world economy, partnership, and business management [3, 5], Duncan B. [6], Collard A., Cheung C., Chen W., Wilson C. [7]. The authors investigated the processes taking place in the global environment, the possibilities and relevance of adaptation to changes in spheres and branches of the economy, society, and personality. Under modern conditions, there is a question of ensuring an effective partnership in all spheres of interaction, which will allow us to jointly solve urgent issues of adapting business to technical and technological changes, digitalization of society, ensuring food, energy, environmental, information and public security [4, 8].

The last three decades of world history took place in conditions of globalization and economic integration. More and more factors determine that the competition between the countries of the world is intensifying, which leads to certain negative expectations, especially due to the growing role of China in the world economy. Analysts of the World Economic Forum also determine the propensity for negative expectations in the world. It is partnership and effective interaction that is a priority in view of the strengthening of negative trends in the socio-economic and political spheres, which is reinforced by the growth of social unrest and military conflicts, as well as the need for business adaptation to changes. The global transformations of the world were summarized in global trends determined by analysts until 2040, the description contains key trends that will affect society, spheres and branches of the economy, people's lives and the functioning of states and regions of the world. Global transformations are primarily caused by demographic and migration processes. Aging of the population and a significant decrease in the specific weight of the young population is an urgent issue not only for European countries, North America and Japan, the trends of population aging are already felt in the most populous country in the world - China [11].

Global transformations have a significant impact on approaches to business management and orientations in the development of society. That is why the main trends should determine approaches and priorities in business management with an orientation to leveling threats and providing opportunities for effective partnership at different levels of management.

What global transformations are taking place and what opportunities does business and society have, what approaches are prioritized for management and obtaining results in the context of orientation towards sustainable development? Peculiarities and priorities in the development of spheres and branches of the economy, interaction and partnership are related to the mental characteristics and structure of the national economy, the level of its resource intensity and readiness for the introduction of technological solutions. The competitive advantages of the countries of the world at the global level are determined by the technological readiness of business and financial opportunities that allow the implementation of the applied aspect of scientific developments and modern business trends.

## RESULTS

Existing demographic trends indicate that by 2027, the most populous country in the world will no longer be China, but India. It is expected that the specific weight of the population over the age of 65 will be up to 25.0% of the total population of the developed countries of the world. The average age of citizens in EU countries will increase to 47 years, in Japan - to 53 years. The situation is different in African countries, Latin America and South Asia, where the share of the young population is constantly growing. Population growth in African countries is expected to double by 2050.

The rapid growth of the specific weight of the young population implies an increase in the relevance of the issue of labor employment or external migration, provided that there is actually no opportunity to get a job and ensure the possibility of consumer spending. The possibilities of further urbanization in African states and South Asia are limited by economic opportunities, which will encourage the growth of migration processes to the territory of the developed states of the world, mainly to European states and the USA - the "states of the global north" [11].

The solution to demographic and migration issues can be ensured only if the spheres of global partnership and effective interaction of participants at different levels of management are expanded. Opportunities for effective partnership and internal state programs should be mutually consistent, and a joint migration policy will ensure social security for the population of states and regions of the world.

In the USA and European countries, the main emphasis of interaction should be focused on motivating the young population to increase the birth rate and provide social guarantees, support young people and create favorable conditions for childcare, as well as the development of new business areas that will increase the level of employment. In most of the African and Asian countries of the world, the main emphasis of interactions should be directed to the creation of new jobs and self-development of young people, reducing the pace of external migration and providing opportunities to increase the level of social guarantees by supporting the development of one's own business, increasing the level of solvency of the population, as well as expanding opportunities in the labor market.

For Ukraine, due to the military conflict, the relevance of all issues of the state's social policy and partnership in the demographic and migration spheres has significantly increased. Partnership with European states, the USA and Canada is not only of a social nature, but is also a necessary necessity to preserve people's lives, national traditions, and the mentality of the population. Ukraine received substantial support from global society at the G-7 and G-20 summits in 2022. The agenda of the meetings began and ended with issues related to the support of Ukraine in the socio-economic and military-defense spheres. The main trends in expanding spheres of cooperation and assistance to Ukraine were also on the agenda of the World Economic Forum in Davos. Areas of interaction with partners were focused on meeting the needs of the state during the period of martial law.

Climatic anomalies are defined in the context of global transformation by the second issue in the relevance of the processes taking place in the world. Climatic changes and extreme natural phenomena can not only limit the possibilities of living in a certain area, but also encourage climate migration. The expectations of the next 10 years are characterized by negative natural phenomena and the strengthening of negative manifestations due to droughts, floods, natural and climatic phenomena, which will encourage an increase in the level of riskiness of agriculture. The negative impact of natural and climatic factors will influence the formation of food security in the world and its individual regions. It was determined that more than 36.0% of the world's territories have systemic problems in the environmental sphere. The most threatening are the processes in Central Europe, North America, South Africa and the Middle East.

The implementation of tasks in the environmental sphere must be systemic, only under such conditions are there opportunities to ensure the effectiveness of the identified priorities for environmental protection and the spread of the "green economy" sphere. Most European states are focused on using opportunities in the field of "green economy" and reducing the negative impact on the environment. Such an environmentally-oriented policy involves the use of appropriate mechanisms of interaction between participants and motivation to implement defined tasks in view of the priority of environmental protection. The public is widely

involved in the implementation of environmental tasks, which proves the experience of recent years in involving young people in solving not only local, regional, but also global environmental tasks.

Global priorities in environmental protection are implemented taking into account the specifics and characteristics of the world's regions and states, but the overall funding for the implementation of environmental measures was significantly limited due to the need to neutralize threats due to the COVID-19 pandemic. Most of the countries of the world were forced to orientate their domestic policy on the solution of public needs in the fight against and prevention of the disease. Similar trends in the last three years were most significant in states that do not have sufficient own financing and received funds for the implementation of environmental programs from international funds and public organizations.

Solving environmental problems on the territory of Ukraine was also adjusted to public needs in the field of health care, and from 2022 in the field of defense. The relevance of environmental issues is no less significant, but priorities have changed and the solution of environmental problems, especially regarding water, soil and air pollution, the development of the "green economy" sphere will be adjusted to the events that are taking place. The implementation of defined environmental tasks in accordance with the Paris Agreement in the environmental sphere will be adapted to the situation with financing and infrastructural support of the processes. Since a holistic strategy and partnership is a prerequisite for the implementation of environmental tasks. The policy of "green energy transition" requires not only significant funding, but also appropriate motivation for its implementation, effective partnership, which proves the experience of European countries, Japan, New Zealand, and Canada. The implementation of environmental programs takes place through the implementation of grant projects, which also involves the coordination of the interests of the participating parties and the orientation towards effective partnership in business areas.

Global transformations will take place in the economic sphere due to the increasing level of competition between educational states, especially between the United States and the China. It is expected that there will be a trend towards an increase in the level of external debt of the world's states and a redistribution of financial flows, which may change the conduct of social policy and lead to social tension in society. Due to the impact of the pandemic, in the last three years, the average level of external debt obligations has increased to the level of the 90s of the last century. The increase in the debt obligations of the countries of the world will have an impact on the possibilities of financing social and environmental programs, as well as on the state policy in the financial sphere. Such expectations will require the implementation of approaches in business management in view of and strengthening of financial risks in the world.

Given the situation in 2022, the need to expand cooperation with the World Bank Group may significantly increase in Ukraine. Existing arrangements with the IMF, IBRD and EBRD may be adjusted for military and defense needs. Partnership in the economic sphere determines the possibility of orientation of the spheres and branches of the state's economy to modern trends of internetization, digitization and development of the field of artificial intelligence. The partnership itself promotes the use of relevant information and innovative technologies, conducting scientific research, research and development, design and construction, technological, search and project-search works, and other works related to bringing scientific and scientific and technical knowledge to the stage of practical application. introduction. The partnership stimulates the development of service provision related to the development and support of projects, encourages the protection of the interests of participants, provides for conducting examinations and evaluating feasibility, adjusting the relevant regulatory and legal acts, programs and projects, interaction mechanisms. The joint implementation of the tasks allows to distribute not only the results, but also the responsibility and potential risks among the participants, including international ones.

One of the directions of global transformation is the change of approaches in the relationship between the government and society. Partnership at the level of society allows determining the main priorities in development, taking into account the needs of the participants. Expanding the scope of the information environment and the use of appropriate software allows you to significantly expand the scope of interaction without additional bureaucratic complications. The experience of various public organizations that use the



format of online surveys and questionnaires is positive. Conducting similar public surveys allows you to determine priorities and the level of interest of an individual in solving public issues. Changes in social relationships have a significant impact on social attitudes and the ability to focus efforts on topical issues that increase the level of public trust in government institutions.

Similar experience in the Scandinavian countries is positive, the active position of business and the public in the development of various spheres of interaction is confirmed by the results in the social, economic, information and environmental spheres. The influence of the mentality of the population is also significant, in the absence of mechanisms of interaction or limiting the possibility of solving social issues, this can lead to social disturbances and conflicts. The percentage of such territories in the world is estimated at 23.0%, but the indicator tends to increase due to the lack of positive changes in the relationship between society and the government.

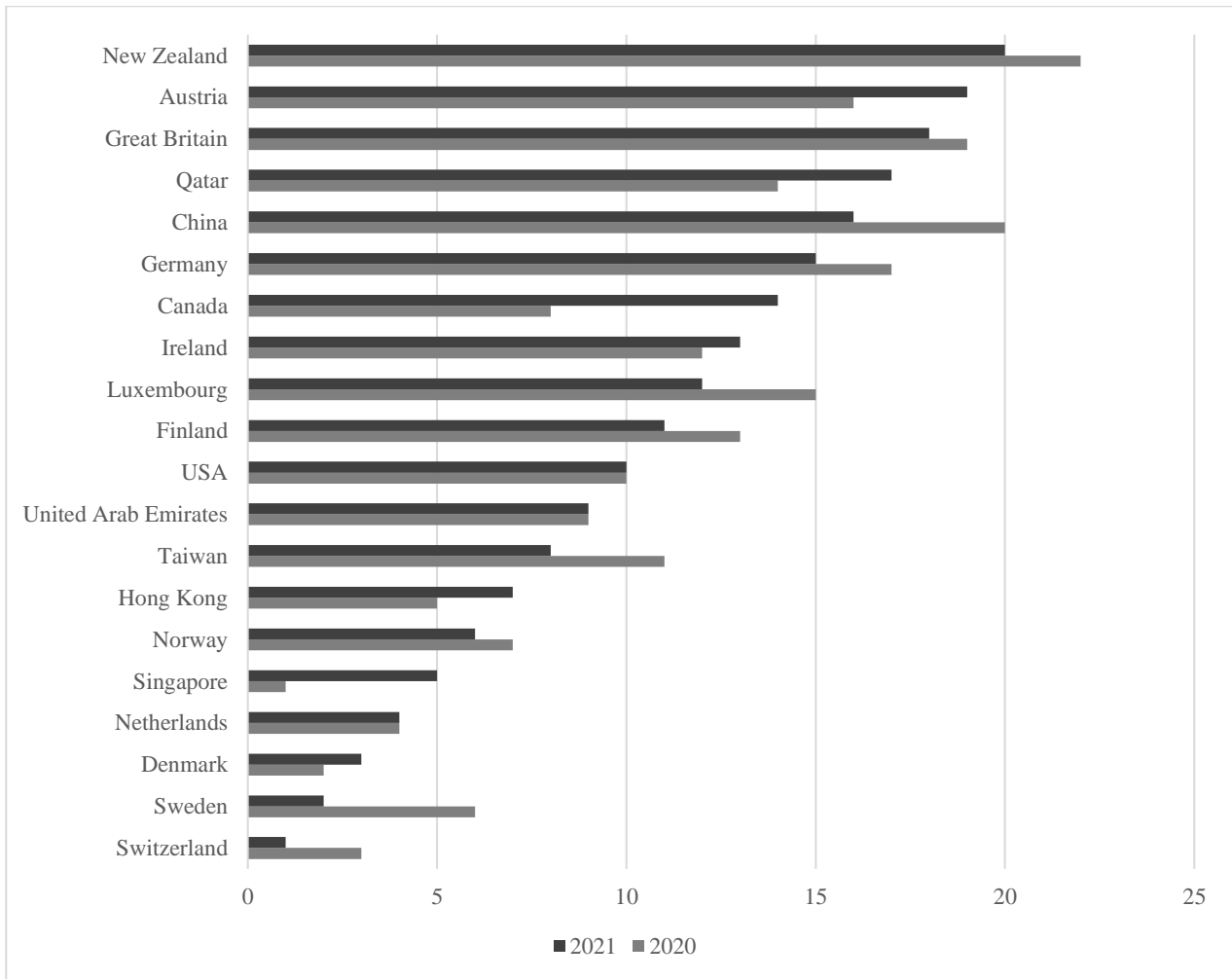
The priority of the further development of global society should be to focus on strengthening political and social institutions and creating an effective system of social elevators in order to ensure effective communication with the population and leveling social threats. The question is also relevant in the further development of Ukraine, especially in view of the deterioration of the macroeconomic situation and the military conflict. At the global level, a significant economic priority is determined in the development and needs of business, which is associated with changes in international relations. The global struggle between the states of the world (the USA and China) may lead to the creation of a larger number of regional associations or alliances that will form their own competitive environment for conducting trade operations and obtaining resources for the needs of business and society [11, 12].

That is why the activity of international organizations and the Governments of the world's states in the future should be focused on preventing global conflicts in the political, socio-economic and information-technical spheres. Global partnership and mutual coordination of interests is an essential priority in ensuring social stability in states and regions of the world, provides opportunities for business development and minimizes risks. Recently, the industrial and technological struggle between the United States and China has intensified, and China has gradually become the main global competitor of the "globalizer of the world" - the United States. The development priorities of China are focused on scientific research and the expansion of technological capabilities, which significantly strengthens the competitiveness of the state's business spheres. The policy of the Government of China is aimed at limiting the attraction of foreign capital and reducing the level of dependence on any external financing. How can a similar situation between the USA and China affect the global world, what are the prospects for the development of the global world? The positions of the countries of the world are evaluated by the World Economic Forum, which allows investors to determine the guidelines for the development of spheres and branches of the economy, business investment priorities (Figure 1).

The results of the research, which are published every year at the World Economic Forum, are used by the World Bank Group and other international and regional, industry associations and organizations. And also provide opportunities to determine the main priorities of development and approaches to adaptation to global changes, orient business to effective management approaches.

Given the current trends in the global world, the international system of the future will have a multipolar format. Expectations for the future are focused on the creation of flexible and situational regional alliances, which will form the basis for the expansion of partnership spheres and the definition of common guidelines for development, stability and coordination of the interests of the participants.

It is expected that the regional partnership in such alliances will be focused on the possibility of increasing the competitive positions of the participating states, which, in turn, will provide an opportunity to strengthen their participation in the formation of the global economy, business development taking into account the needs of aggregated markets. The global competitiveness of the countries of the world will be adjusted based on the effectiveness of business adaptation to existing changes and possible expectations.



**Fig.1. Positions of the countries of the world according to the Global Competitiveness Index (Global Competitiveness Index)**

*Source: information from the World Economic Forum based on the results of the IMD World Competitiveness Yearbook (2021).*

According to the information of the World Economic Forum, the positions of the countries of the world have changed somewhat. According to the index of global competitiveness, since 2020, Asian countries have lost their positions, namely: Singapore, which occupied the first place in the rating, and Hong Kong, which occupied the 5th place in the rating. Taiwan and China have increased their positions, occupying 8th and 16th place in the global competitiveness ranking in 2021 (11th and 20th place, respectively, in 2020). European countries such as Switzerland, Sweden, Denmark, the Netherlands, Norway, and Finland, as well as the United Arab Emirates and the United States, will be among the top countries in the world in 2021. High positions in the rating are occupied by Luxembourg, Ireland, Canada, Germany, Qatar, Great Britain, Austria and New Zealand.

Significant differences occurred in the ranking of Canada's global competitiveness (8th place in 2020, 14th place in 2021) [1,2].

Ukraine ranked 55th and 54th in terms of global competitiveness, the evaluation was based on 333 criteria, the key ones of which are: the state of the economy, the effectiveness of management, the state of the business environment, and the state of the infrastructure.

The main competitive forces today are divided between the United States, which ranks 10th in terms of global competitiveness, and China, which ranks 16th in the ranking as of early 2022. As global trends change all spheres and branches of the economy and society, the orientation and priorities of further development are

determined by the industrial and technological advantages of business, the speed of adaptation to changes and the formation of appropriate communications for the development of infrastructural support. Therefore, the policy of interaction should be multi-level and comprehensive, which will allow to ensure the expectation of improving the competitive positions of small, medium and large businesses.

For Ukraine, an important aspect is the regulation of foreign policy in the sphere of interaction with international organizations and main partners in spheres and branches of the economy, on various aggregated markets. The relevance of the issue is enhanced by the migration processes that took place in 2022 (external migration, internal displacement of the population due to the military conflict), as well as limited opportunities in logistics processes in part of the state's territory, especially port infrastructure.

An important component in further development is the orientation to the formation of a long-term policy that will allow adaptation to changes in the global environment and determine the main priorities of partnership relations between participants, to ensure the protection of national interests. The main priorities in the development of the global world are determined by the needs for resource provision of spheres and branches of the economy, the needs of society, the specifics of the development of information technologies and their introduction, technological readiness for the implementation of investments and the possibilities of expanding the spheres of interaction between business, government and society. The main positions of the leading states of the global world are characterized by such parameters as industrial and technological competition. The industrial production of China is almost 30.0% of the world level, the USA - 17.0 percent.

China is expanding its position in the shipbuilding industry, during 2021 foreign and domestic corporations of China will produce about 28 million cars. The trends of recent years determine the essential priority of China in the field of industry, even due to lost positions during the Covid 19 pandemic. The USA remains a leader in the manufacture of high-tech products, aircraft and space rockets. The global aircraft construction market is dominated by the American "Boeing", "Lockheed Martin", "Sikorsky Aircraft", and "Gulfstream Aerospace", which produce more than a third of all aircraft on the planet. Elon Musk's "SpaceX" is one of the largest rocket manufacturers, its Falcon 9 reusable heavy rocket is more powerful and efficient than its Chinese counterpart, the Changzheng 8 (Long March 8) rocket.

So, the challenges of the modern global world are technological advantages that are actively invested by domestic and foreign corporations. In recent years, investing in the areas of artificial intelligence development, 5G and 6G telecommunications, quantum information technologies, biotechnology, genetic engineering and "green economy" has been significant. Due to the active development of Internet corporations, which are concentrated in the USA, there are certain risks and there is a need to expand the positions of corporations from the European continent and Asian countries, as a competitive advantage for the American companies Facebook, Google, Amazon, and Microsoft. Similar trends form the corresponding need to adapt global business to changes in view of the processes and phenomena occurring in the information and telecommunications spheres, and are oriented towards the need to improve one's own competitive positions.

During the last year, the USA spent 42.0 billion US dollars on developments in the field of artificial intelligence, China- 25.0 billion US dollars. The position of the Chinese Internet corporations Baidu, Alibaba, and Tencent, which are significantly expanding their capabilities in the field of artificial intelligence, is active. There are expectations that China will become the main player in the market of technological solutions in the field of artificial intelligence in the next ten years. China is significantly increasing its position in the field of telecommunications, as of the beginning of 2022, the country will already have a million 5G towers operating. The main suppliers of equipment on the world market for the field of telecommunications are mainly Chinese companies, Huawei remains the leader.

In the global world, it is the development of telecommunications and their management that determines competitive advantages and the main guidelines for further development and competitive positions in the world. In view of the significant dependence of world society on the infrastructural support of the telecommunications sphere, 35.0% of the world's patents for the development of 6G belong to China, 18.0% - to America. The field of artificial intelligence and modern telecommunications remains a priority area of

development in the global world. That is why most efforts in attracting investment are directed at the development of these industries and their infrastructure support. The USA maintains active positions regarding the production of robotics for industrial and public needs. In the USA, a separate state program in the field of robotics began to operate. China, Japan and South Korea are also active players in the robotics market in the world. A joint technological hub in robotics and 10,000 workers using 255 industrial robots was created. The project was implemented by the USA together with Japan and South Korea.

In view of the existing trends, it is the USA and European states that are trying to introduce those levers that limit the spread of the Chinese 5G network by creating appropriate restrictions and realizing opportunities for the formation of their own competitive advantages in this area. In recent years, China has significantly expanded its capabilities in the production of drones and the development of quantum informatics, namely: quantum computers, quantum networks, and quantum sensors. Every year, the investment volume of the industry in China is up to 10.0 billion US dollars, which confirms the need and relevance of the development of quantum informatics due to its wide possibilities (from financial to defense spheres). Quantum networks are secure communication channels between quantum computers and have the largest network specifically in China - 4,600 km (Mozi quantum satellite, 2016).

The development of quantum informatics is complemented by opportunities that world states and business sectors can implement in the field of biotechnology. The urgency of the issue is due to the trends determined by technological innovations in the spheres and branches of the world economy, especially in view of the need to guarantee the food security of the world and individual regions. The introduction of biotechnology allows to significantly expand the possibilities of agrarian business in increasing the volume of gross production of agricultural products and food supply.

The use of genetically modified plants in the industry has a significant spread in the USA, China, Latin American countries and Asia. The countries of the European Union emphasized organic production. But the issue of world food security was and remains relevant, which is confirmed by the situation with the transportation of grain from Ukraine in 2022. The fields of application of biotechnologies are very wide and relevant in view of the global trends in their distribution. The main concentration of the industry and the largest number of companies working in the field of biotechnology are located in the USA and China. Investment volumes are growing every year, and the number of patent developments in the field of genetic engineering is increasing. The leadership positions in the industry remain with China, which has invested up to 100 billion US dollars in development.

Opportunities for interaction and partnership at the global level remain wide enough in view of global trends in digitization and internetization, technology development in industries and spheres of the economy. Strengthening the interests of the participants depends, first of all, on the interests that arise in view of the national interests of the states, the interests of business, including TNCs. Partnership at the global level can unite the interests of the participating states, which will allow to strengthen competitive advantages and opportunities, including with regard to resource provision of industries and public needs.

Development in the field of "green economy" remains a modern trend. EU states are active participants in the introduction of environmentally-oriented technologies, but over the past 10 years, China has significantly increased its own solar, water, and wind energy production capacity. In addition to its own production, China is actively expanding its production capacity in the field of supplying equipment for the needs of the "green economy". As of the beginning of 2022, China produces up to 70.0% of the world's solar panels, 40.0% of wind turbines and 77.0% of batteries for the needs of the industry. The generation of solar and wind energy significantly exceeds the American level of production (solar - three times, wind - two times). The capacities for the production of electric cars are being actively increased; in just one year, Chinese car manufacturers received financing for the expansion of their own capacities at the level of 60.0 billion US dollars. Capacity building in the field of "green economy" is conditioned by the Paris Agreement, which defines the main priorities for preserving the world's ecosystems.

Most of the positions of the USA and China have not been implemented, but regarding the use of

nature's opportunities in energy supply, they have significant advantages compared to other countries of the world. The applied use of developments in the field of "green energy" is a significant advantage not only in terms of financial opportunities, but also environmental priorities in preserving the territories of the world and its individual regions. Modern business actively participates and expands production facilities for the production of equipment and logistics in the field of "green economy".

The modern global world can be characterized as interdependent, therefore, most active players in the world market try to find alternative options for interaction, even if there are different interests at the national level. One of the most difficult issues is the sufficiency of resource support for production, therefore, interaction and partnership were and remain an urgent need for the development of the world economy, modern business and its management. Technological competition is supplemented by the need to solve urgent issues of interaction in various aggregated markets (commodity, financial, labor market). The issue of interaction is strengthened by population migration, which is a forced necessity due to the increase in military conflicts in the world, as well as due to the significantly different population concentration in different regions of the world (population concentration per unit area in the EU states from 4.0 in Macedonia to 336.8 people per km<sup>2</sup> in the Kingdom Belgium, the average population concentration in the USA is 32.8 people per km<sup>2</sup>, the average population concentration in China is 147.1 people per km<sup>2</sup>, the average population concentration in Latin America is 26.6 people per km<sup>2</sup>, the average population concentration in the African continent is 42, 12 people per km<sup>2</sup>). The issue is relevant in view of the need for the formation or adaptation of social infrastructure to the requirements of modern times, the creation of jobs in view of the needs of the labor market and ensuring the interaction of society, business and the population.

The main global trends are characterized by: increasing investment volumes of priority spheres and branches of the economy; expansion of patent possibilities; expansion of spheres of applied implementation of technological solutions; civil society; expansion of the spheres of use of artificial intelligence; increasing the level of training of engineering personnel; the development of the intellectual and emotional intelligence of young people, the expansion of the level of creativity of young people through Soft Skills; motivation to study, development of adult education; development of human capital and increase in labor productivity; expansion of spheres of interaction and partnership in the development of spheres and branches of the economy, coordination of interests at the level of associations and regional alliances; adaptation of business to modern global trends, changing approaches in conducting business in view of the high competitive advantages of TNCs.

The identified priorities allow the countries of the world to ensure long-term sustainable socio-economic development and financial stability, to form prerequisites for business development and to ensure the strengthening of its role in the development of society. Financial aspects remain relevant for all players in the global world and are a priority given business investment needs. Dependencies and vulnerabilities of the world's financial system are focused not only on economic and social foundations, but also on political stability. Commercial partners are focused on obtaining expected interests from interaction, and International Financial Groups - on the possibility of obtaining mutually beneficial conditions of financial partnership. International investment mechanisms are a separate direction of interaction and interdependence of spheres and branches of the economy at the global level. Regarding the world's major global players, the US corporate investment in China economy as of the beginning of 2022 was 260.0 billion US dollars, the corporate investment of China in the US economy was 155.0 billion US dollars. There is an active position in interaction at the level of transnational business, the lion's share of which is concentrated in the USA, EU countries and Great Britain.

Transnational business covers more than 500 of the largest US companies, which have from 11 to 50 branches of the economy. Industrial TNCs in Great Britain (96), Germany (78), France (84) and Italy (90) are multi-industry. TNCs provide about 50.0% of all world industrial production, TNCs account for 70.0% of world trade and 40.0% of trade takes place within TNCs. TNCs currently hold almost 80.0% of all world patents for inventions, and have an active position in financing scientific developments and innovations.

TNCs combine production, financial, insurance, telecommunications, auditing, investment, and informational interaction capabilities. Interconnections within TNCs take place at transfer prices, and their activity is determined by the economic expediency of the participants. Such interaction on the global market provides significant advantages to participants, including within the framework of interaction between the parent company and subsidiaries. A similar format of business management proves its effectiveness. TNCs are currently the largest players in the aggregated markets and are expanding their capabilities in various areas of modern business.

American corporations have access to the Chinese market, currently 20.0% of the profits of Apple and Intel corporations come from this interaction. The investment possibilities of interaction between states that act as globalizers in the world market are essential. That is China is the second largest holder of US securities, and because of its trade surplus, China is actively buying up US Treasury securities. In 2021, the current account surplus of China's balance of payments is recorded at the level of 315.7 billion US dollars, which is 1.8% of the country's GDP. During 2021, China's export and import potentials continue to grow steadily, goods trade had a positive balance of 554.5 billion US dollars, which is 8.0% higher than the growth of 2020. The balance of payments of China remained at a balanced level, even in the conditions of the negative impact of the pandemic [11].

Cooperation at the global level between the countries of the world allows to ensure the technical and technological renewal of production and stimulates investment, which is an important component of the development of all types of innovations in spheres and branches of the economy. The formation of the market for high-tech products requires significant capital investments that can be afforded by TNCs and states that finance scientific and technical developments and are interested in the growth of patent developments. The scope is very broad and is focused on creating new opportunities in the development of own industries, which will have a growing demand in the future.

Technological dependence is also a motivating factor for the development of own production and the reduction of high-tech imports. As of the beginning of 2021, China has invested almost 770.0 billion US dollars in 138 countries of the world. Taking into account the expansion of investment opportunities in China, the Asian Infrastructure Investment Bank was established (2015), which made it possible to implement financing of investment projects and provide opportunities for expanding financial influence on the development of spheres and branches of the economy of other countries of the world. The creation of a similar financial structure made it possible to unite 104 countries of the world into an international financial institution, which is a regional competitor of the World Bank Group. The created international financial institution has provided loans for almost 15.0 billion US dollars as of the beginning of 2022 and can realize investment opportunities in yuan, which will ensure the export of capital [12]. A similar approach to financing will allow China to pursue its own policy and strengthen the position of its own currency at the international level.

## CONCLUSIONS

Modern trends in business development and management determine the priority of joining efforts in order to realize opportunities in various spheres and branches of the world economy. Existing resource capabilities, technical and technological solutions, scientific and applied developments make it possible to significantly strengthen the world economy, provided that the interests of the participants at different levels of management are coordinated. Effective partnership in the global world is a prerequisite for defining and implementing priority development tasks, adapting the world economy to changes, and adjusting tasks that will ensure the leveling of threats and strengthening the positions of the world's states in terms of global competitiveness. The main players of the global world will continue to expand their capabilities, and other participants have the opportunity to unite in order to strengthen their competitive positions in regional alliances or interest investors in spreading financing to a greater number of spheres and branches of the economy. Provision of opportunities in the implementation of joint tasks with the aim of reducing the level

of threats in various spheres and branches of the world economy and the priorities of the formation of a fair economy was stipulated at the World Economic Forum in 2022. These are the trends that should unite the global world in order to provide public needs at different levels of management, taking into account the needs of business and society. Business management in the global world was and remains an urgent issue of our time, and the threat of processes and phenomena should motivate joint resolution of issues on the basis of interaction and effective partnership, as evidenced by the experience of states that actively use partnership in various fields of activity (from education to quantum informatics).

The issue is gaining particular relevance due to the strengthening of the level of competitive industrial and technological struggle between the United States and China. The opportunities of global business are focused on the main trends of their interaction and the demands of the modern world, the use of business models that are oriented to dynamic target settings, the possibility of eliminating resource limitations or their optimization (thrifty use of resources), the use of insourcing and outsourcing, management of investment and innovation potential in real-time mode, management of human resources based on the interests and motivation of workers, development of creative thinking and prompt response to situations. The need for risk management on aggregated markets and the use of business management practices taking into account the needs of different groups of participants, as well as the use of a model of employee motivation to increase the level of their competencies through participation in adult education projects, and the activation of communication processes between all groups of business participants, remains relevant.

The use of flexible business management models in the global world involves meeting the interests of all groups of interested parties, forming and practical use of the appropriate corporate culture, which will allow us to join forces and obtain the desired (expected) results from the implementation of activities. The experience of modern companies in the USA and China proves that the transformation of knowledge into an applied aspect of use, the activation of innovative processes and the increase of the level of technological readiness and the readiness of personnel for their development, the generation of ideas and their critical and operational evaluation, the commercialization of scientific developments and cooperation with educational and scientific institutions allows you to get those priorities that ensure the stability of competitive positions of business and its interaction with society on mutually beneficial terms.

The partnership itself stimulates the implementation of the set tasks and allows to distribute not only the results, but also the responsibility and potential risks among the participants, including international partners. The choice of a business model depends on the goals, tasks and interests of the participants, and competing positions are opportunities that are realized by joint efforts and taking into account the established priorities, the conditions formed and the ability to quickly adapt to global changes. Business management in the global world is difficult, but the existing experience shows that there are always opportunities, they must be identified and timely adapted to changes, and the priority was and remains those who make decisions and are responsible for the implementation of the tasks in the business environment.

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## **CROWDFUNDING AS AN INNOVATIVE FINANCING TOOL FOR ENTREPRENEURSHIP IN CREATIVE ECONOMY**

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### **ABSTRACT**

*The article examines the peculiarities of crowdfunding technologies as a mechanism for financing entrepreneurship in the global creative economy. It is emphasized that crowdfunding is a collective collection of funds via the Internet for charitable purposes and commercial projects. It was determined that crowdfunding is popular at the initial stage of implementation of various startups. It is substantiated that in order to develop new crowdfunding technologies, it is necessary to learn how to build long-term relations with government bodies, business structures and representatives of the population in the process of inter-industry partnership. It is claimed that an effective macroeconomic solution to the problems of introducing innovative financial instruments is possible only if all structures of the ecosystem are involved, each of which should contribute its share of assistance to the resource provision of start-up entrepreneurs. The author's proposals for the integration of financing tools into the entrepreneurship ecosystem are presented as a tool for raising funds to finance a startup project at the initial stage, characterization of foreign and domestic crowdfunding platforms and identification of prospects of its development in Ukraine. The creative economy offers all countries and developing countries, especially countries that will recover from Russian aggression, real opportunities for development.*

**Keywords:** *crowdfunding, innovation, financing tool, management, entrepreneurship structures, creative economy.*

### **INTRODUCTION.**

The economy of joint participation (Sharing Economy) involves mutual (P2P) access to goods and services thanks to online tools. In contrast to the traditional economy with established business models, the economy joint participation is based on trust and cooperation between people who are ready to share resources directly, without mediation, only thanks to digital interaction tools. Alternative financing, which is part of the sharing economy, involves decentralized ways of exchanging capital for social and economic development. Crowdfunding in all its forms is a form of alternative financing. A crowdfunding mechanism for the creative economy can not only be a source of funding, but also help build community and test business ideas. The creative economy is crucial for sustainable development.

The International Year of the Creative Economy 2021 has focused the world's attention on the creative economy at a time when creative solutions are needed to overcome global challenges. As stated in the resolution of the United Nations General Assembly United Nations General Assembly resolution 74/198.4 the creative economy contributes to the achievement of the Sustainable Development Goals (SDGs), especially Goals 1 (poverty eradication), 5 (gender equality), 8 (decent work and economic growth), 9 (industry and economic growth), 9 (industry, innovation and infrastructure), 10 (reducing inequality), 11 (sustainable urban development), 12 (sustainable consumption and cities), 12 (sustainable consumption and production patterns), 16 (peaceful and inclusive societies) and 17 (means of implementation and global partnerships).

In 2021, in a study towards the implementation of General Assembly resolution 74/198 on the International Year of Creative Economy, UNCTAD conducted an online survey on the creative economy and creative economies and creative industries. Responses were received from 33 countries and they explain exactly how the creative economy has become sector whose social, political and economic importance at the national level is growing. Almost all countries that participated in the survey have at least one body responsible for the creative economy and creative industries. But no two countries have the same institutional arrangements. In most countries, responsibility for the sector is shared between several agencies. Countries such as Canada, Central African Republic, Colombia, Central African Republic, Georgia, Germany, Hondu-

ras, Nicaragua, Panama, Peru, Slovenia, Turkey, United Arab Emirates and United States, Slovenia, Turkey and the United Arab Emirates have a single national ministry, vice-ministry or agency with overall responsibility for the creative economy. Most countries distribute responsibilities for creative industries among several ministries and departments such as culture, sports, heritage, tourism, youth, trade, foreign affairs, intellectual property, telecommunications, innovation and education. Countries pay attention to measuring the economic contribution of their creative industries. They publish statistics on the creative economy, such as the contribution to GDP, the share of creative goods and services in total exports and imports, the number of people and businesses employed in the creative sector, and participation in cultural life.

Several frameworks exist to measure the creative economy with patterns of common industries and products covered (i.e., arts, audio-visuals, publishing, music, performing arts, photography), but also differences due to national or regional classifications; activity or product coverage; methodology and guidelines; and types of activities and products covered (i.e., cultural and related, creative, auxiliary, interdependent). The most frequently used guidelines are the 2009 UNESCO Framework for Cultural Statistics, WIPO's 2015 Guide on Surveying the Economic Contribution of the Copyright-Based Industries, guidelines for cultural satellite accounts by the Andrés Bello Organization Agreement (widely used among Latin American countries), and the Guide to Eurostat culture statistics (used in the European Union). Considering UNCTAD's mandate as the focal point of the United Nations system for the integrated treatment of trade and development, in terms of measurement, UNCTAD focuses on international trade and compiles data on international trade in creative goods and services [11].

The creative economy is one of the fastest growing areas of the world economy. Creative industries create jobs and income, drive innovation and increase the wealth of nations. In modern conditions, a developed ecosystem of entrepreneurship remains necessary for the successful development of the integration economy. The creative economy is primarily about competition, which in turn has many challenges for new businesses. Entrepreneurs, as a rule, face many problems, especially related to the start of their company, as most talented and promising entrepreneurs do not have the financial resources to develop their projects. But they have an idea that can change the world, but may not be implemented. Therefore, this problem in the 21st century can be solved by crowdfunding, that is, the cooperation of people who voluntarily provide financial assistance to create a startup.

#### **ANALYSIS OF RECENT RESEARCHES AND METHODS OF RESEARCH.**

Important for the study of the chosen topic are works of foreign scientists, in particular: K. Alter, D. Bornstein, G. Deese, B. Drayton, P. Drucker, W. Sombart, I. Kirzner, D. Collins, I. Marty, D. Mair, J. Porras, J. Schumpeter, M. Yunus [2;5;7]. Research of crowdfunding technologies and fundraising technologies in social entrepreneurship received attention: K. Borsaga, G. Galera, J. Deforni, M. Nissens, J. Curlin, G. Neck, A. Predo [4;6;8].

The results are based on modern scientific research and financial data to implement the financing process through the crowdfunding tool. System analysis is used to understand the subject of research, that is, what is crowdfunding in the creative economy and how it can affect the development of the business model of entrepreneurship; what is the role of crowdfunding in the financial ecosystem of entrepreneurship. Based on the synthesis, a number of conclusions are drawn, aimed at building a clear concept of cause-and-effect relationships between crowdfunding and new business models of entrepreneurship. Causal analysis is used for a network created to capture the relationships and impact of implementing a new business model. With the help of the analysis, a logical sequence of factors and their interrelationships within the entire process of financing the initial stage of the enterprise for the implementation of the idea or startup implementation process was established. The identified elements indicate directions that must be implemented in the ecosystem of business structures for a successful implementation process.

Crowdfunding originated in the USA and was aimed at supporting non-commercial projects - artistic or charitable - that could not be implemented without financial support. However, with the development of computer and information technologies, the term gained more popularity, startups began to use it as a tool for attracting funds to finance their projects, the geography of its use and areas of application expanded. At the current stage of crowdfunding development, its most popular directions in the world are: social projects, film and video industry, music, publishing, technologies, design, art, inventions.

According to such conditions, the initiator of the project can receive funds for such circumstances [8]:

1. "all or nothing" - funds are transferred to the project author's account only when the stated amount is reached. If the required amount is not collected, the money is returned in full depositors;
2. "keep everything" - collected funds are transferred to the author of the project in any case;
3. "subscription" - funds are transferred from the depositor immediately to the account of the project author. This model is most often used by charities projects;
4. "free price" - investors personally decide how much is needed to finance the idea. The author receives the collected funds;
5. "permanent financing" - a constantly operating model, according to which financing passes into the stage of actual financing of activities, preliminary orders and attracting customers;
6. "tipping point" - the funds are transferred to the author of the project in case of reaching an amount lower than the announced cost of the project, if the author is sure that these funds should be at least sufficient for the implementation of the idea.

According to the above conditions, the collected funds are transferred to the initiator or returned to the depositors. In case of collecting the declared amount of funds in full, the author of the idea must reward the contributors. However, contributors (sponsors, investors) also have an interest - a reward. In practice, four types of rewards to depositors are distinguished:

- crowdfunding with a non-financial reward (rewards-based crowdfunding): supporters of the idea donate a sum of money in exchange for the manufactured product (pre-order option);
- charitable crowdfunding (donation-based crowdfunding): funds are collected for charity or a specific purpose, for example, for drilling a well or building a school for a low-income community, or for private campaigns, for example for medical treatment of a person;
- equity crowdfunding: investors invest large sums of money in the company in exchange for a small share of its capital;
- investment crowdfunding: lenders provide a loan, counting on the return of the principal amount of the loan and interest.

Since gaining worldwide popularity, crowdfunding continues to develop, new crowdfunding platforms are being created in different countries of the world. Their essence is the same, but the terms of implementation differ depending on the legislation and economic development of the country. In the table 1 shows the characteristics of crowdfunding platforms of different countries, which, according to the CrowdfundingPR resource, are included in the rating of Top100 Global Crowdfunding Sites platforms (crowdfunding sites rating platforms are determined according to statistical indicators: the number of unique visitors per month, the average time spent on the site per visit, the number of pages viewed per online session) [1].

The aim of the article is to study the features of innovative crowdfunding technology as a mechanism for financing entrepreneurship at the start-up stage in the creative economy.

## RESULTS

The development of the financing system for entrepreneurs of the creative economy has great potential, with the availability of capital, creative ideas can be more quickly transformed into specific goods or services (for example, new designs or good productions), with the availability of loans, entrepreneurs can focus on their main activity, and not on payment methods to contractors (for example, when the organization of a large music festival requires upfront payment to contractors, while receipts occur during the festival). The

availability of financing in any form will speed up the market entry of new goods and services, the emergence of new musical works and new forms of creativity, innovative products. Basic of crowdfunding projects are:

1. The principle of success of a crowdfunding project is the interest of a large number of people who are involved in the same issue.
2. Emotional involvement of participants. This means that the idea should touch the feelings of those who will invest in it.
3. Providing investors with a so-called reward. So, for example, if a person collects money for the publication of a comic book, he gives everyone who helped raise money a copy of this book.
4. There should be a clear and specific goal of the entire event. All campaign participants must understand whether collecting money makes practical sense. Therefore, the final amount is specified in crowdfunding projects. If this amount is not announced, then investors simply cannot assess either the feasibility of the idea or the seriousness of the author's intentions.
5. Trust. One of the reliable and simple ways to increase trust is ensure verification of all accounts and wallets for collecting money. Almost all payment systems provide an opportunity to confirm that the owner of the wallet is real and not a fraud. And if the collection is done by a commercial organization, it is simply obliged to provide all its details, which can be easily checked by any person.
6. Full transparency of fundraising. It is important for investors to see that their money has reached the recipient's account. And it is equally important to see for what purposes this money was spent. If a large part of the budget was provided by a sponsor, users should also know about it. Such an opportunity will not only increase confidence in the project, but will also inspire investors.
7. The last principle is ease of use. If there is a convenient button for transferring money – it will be pressed, if there is not - no one will go to the bank and stand in line to send their 10 euros.

There are several typical models of financing creative economy organizations (Fig. 1).



**Fig. 1. Typical models of financing creative economy.**

*Source: based on [10;11].*

We describe the presented models in more detail:

- Self-financing — activity with own funds or thanks to the reinvestment of profits received in the previous period.
- Grant funding is non-repayable funding, mainly thanks to local, national or pan-European programs.

- Vouchers are an interesting form of grant funding — when businesses can use the services of creative economy organizations and pay for such services with a voucher, the cost of which is covered by the local government or an authorized state agency. Such schemes allow manufacturers to attract designers, personnel development departments to attract actors for training or training, etc.
- Tax benefits - the government can stimulate creative economy organizations through better tax conditions, for example when the tax rates of production companies in the film industry are lower than normal rates, which encourages investors to invest in the production of new films. Another example is the scheme to reduce tax liabilities for investors in small creative businesses in the UK.
- Loans are a classic financial instrument. For organizations of the creative economy, credit financing can refer to the start of activity (start-up loan), financing of entry into international markets (for example, export financing) or crediting of activity expansion.
- Microfinancing – when the amount of loans does not exceed 25,000 euros – is a common financing scheme for creative economy organizations in the EU. Less common for the creative economy sector are overdraft (access to credit funds on a regular current account), leasing (gradual payment of the cost of equipment) or factoring (providing financing against the proceeds of already issued invoices). An example is the products of the Catalan Institute of Cultural Entrepreneurship, which provides interest-free loans primarily to increase the audience for organizations in the creative economy.
- Capital financing (equity finance) is the attraction of finance into the authorized capital of organizations of the creative economy, money for a share in the business. For newly created companies, business angels - individuals or specialized financial funds - often become the first source of financing. Seed financing funds can also provide funding at an early stage of a business. At the later stages of growth, creative economy companies use venture capital funds that invest in high-risk, but potentially high-profit, businesses. Venture funding is usually the next step after a business has proven its viability on a small scale (for example, after initial funding from a business angel). Business angels and venture capital funds specializing in creative economy organizations are appearing in European countries. For example, in Catalonia, the local Network of Business Angels regularly organizes funding rounds for creative economy organizations. As businesses grow, companies may need additional rounds of funding, which is when funding funds that specialize in the creative economy are needed.

Crowdfunding is becoming an increasingly common form of financing creative economy organizations.

There are several forms of collective financing:

1. Direct lending — lending to businesses by individuals.
2. Equity crowdfunding — involving business owners through crowdfunding platforms.
3. Reward funding — when project donors receive a certain reward (tickets, books, etc.).
4. Charitable financing — project donors do not expect any reward, they invest in an idea.
5. Revenue/Profit Share Funding — project donors receive a share of the project's revenue/profit.
6. Collective debt financing — donors invest in bonds or other debt obligations.
7. Hybrid models.

The following world trends can also be noted: much more capital was attracted by North America and Europe due to the use of this tool than on similar platforms in other regions. Accordingly, North American crowdfunding volumes increased by 105% and amounted to \$1.9 billion, while European crowdfunding operations increased by only 67% and amounted to \$949 million. As the global economy recovers, the growth of crowdfunding in 2022 will change significantly compared to the previous year.

The global crowdfunding market will reach USD 14340 million in 2022. The volume of the global crowdfunding market will reach 28800 million dollars USD in 2028, increasing by an average of 11.6% during the analyzed period. The report details the factors and constraints of the crowdfunding market, as well

as the impact of Covid-19, which affects on the development of the relevant market. The research covers and includes emerging market trends, market development, market opportunities, market size, sales, market analysis, market revenue, market dynamics and challenges in the industry, detailed sections of the competitive landscape with description of the main companies, including their market share market share and projects [3].

The most popular areas for crowdfunding in the world are: social projects, gadgets and inventions, cinema, video and music, information technology, small business, fashion. The main players of the of the crowdfunding market today are: Kickstarter, Indiegogo, GoFundMe, Fundable, Crowdcube, GoGetFunding, Patreon, Crowdfunder, CircleUp, AngelList, DonorsChoose, Crowdfunder UK, FundRazr, Companisto, Campfire, Milaap, Crowdo, CrowdPlus, Modian, Idianchou, Alibaba, Jingdong, Suning [6].

There are several most popular platforms where you can present your project and get funding for your idea. Kickstarter is the most famous and one of the first crowdfunding platforms in the world, founded in 2009.

It works on the following principle: the project owner needs to register, post a description of the idea and the minimum amount of funds to be raised. If 100% of the specified amount is not collected on time, the money is returned to the benefactors. Kickstarter itself receives 5% of the funds raised. In addition, the platform has geographical restrictions - residents of the United States, Great Britain, Canada, Australia, New Zealand, the Netherlands, Germany, Denmark, Ireland, Sweden, Norway (Ukraine is not yet included in this list) can add a project to the platform. Those from other countries will have to use the services of intermediaries. The main topics of projects include: innovative products, cinema, music, art, games, gadgets [3].

Another popular crowdfunding platform is Indiegogo. It also takes a commission for adding a project to the platform, but there are no restrictions on the type of projects. Music and hobbies are popular, as well as personal finance, charity and much more. Unlike Kickstarter, Indiegogo has no geographical restrictions on the creation of a campaign and funding, so the author of the project can receive money even if he did not collect 100% of the declared amount on time. Crowdfunder is a platform for attracting investments that provides access to one of the fastest growing networks of investors in the world. Often, after placing a project on Kickstarter or Indiegogo, the author registers it on Crowdfunder to attract investors to sell shares. There are also other specialized platforms dedicated to music and literary projects, in particular, PledgeMusic, Unbound, Distrify. For those who want to create their own startup, the resources of Fundable, Crowdcube and Seedrs can be useful. All that is required from the author of the idea is to describe in detail why it is worthy of investment and how the innovation will be useful for society, how it can change the world, or how benefactors can get their money back [5].

Less well-known sites are RocketHub, FundRazr (for non-commercial projects). Another crowdfunding web service is the London project Go Get Funding. On this site it is possible to collect money for any purpose. It can be a fundraiser for both the treatment of a pet and the creation of a short film. During the military operations in Ukraine, crowdfunding platforms appeared aimed at solving various tasks, including providing humanitarian aid to victims of the military conflict, startups and innovative projects for the development of civil society and communities.

## DISCUSSIONS

Crowdfunding allows you to attract financial resources of a large number of people (individual communities, different groups) through the Internet for the implementation of various ideas and projects (mostly startups). The service is usually provided through specialized online platforms that help create the most complete description of the project or financing need. As a rule, they allow you to use attachments in the form of photos, links to videos, documents (business plan, etc.). The necessary amount for financing, the period for which the money is raised and the desired percentage of the potential investor's income are

indicated here. If the project is of a social nature, donations are usually indicated as non-refundable financial assistance.

Crowdfunding is an effective tool for the development of innovative activities of entrepreneurs. Projects started on crowdfunding platforms find the possibility of implementation and develop the creative economy. Such a phenomenon as crowdfunding helps not to disappear the idea that is born from entrepreneurs and startups that lack financial resources at the initial stage of implementation. With the help of startup and entrepreneurship development, it is possible to improve the economic situation, achieve economic stability and development (Table 1).

**Table 1. Features of crowdfunding technologies as an economic mechanism entrepreneurship financing**

Title	Crowdfunding
1. Field of application	It is used in relation to individuals or creative groups
2. Level of capital investments	Low (from 0.5 thousand EURO)
3. The speed of creation collection mechanisms	High (2-4 months)
4. The speed of fundraising during the campaign	Relatively average
5. Possible risks	Low risk of falling real incomes of the population and high inflation
6. Favorable macroeconomic conditions conditions	Brings additional income and performs the function of a backup mechanism
7. Unfavorable macroeconomic situation	Private individuals continue to invest their money in what they consider what they consider to be the most priority

*Source: compiled by the author based on [10;11].*

Advantages of crowdfunding sites. The advantages of crowdfunding sites are:

- expenditure of funds for the intended purpose. According to the rules, most sites do not allow patrons to spend funds on needs not specified in the project;
- broad specialization. On crowdfunding portals, you can implement both business ideas and social or charitable ones;
- transparency. Any person has full access to information about projects;
- focus on the result. Each project owner fully reports on the stage at which the implementation of his case is. If the product fails after entering the market, the money remains with the crowdfunder. If he did not take care of the project after receiving the funds, the money is returned to the owners;
- accessibility. Mostly, there is no minimum threshold for joining the projects. You can invest, having only access to the Internet and free funds;
- ease of use. Crowdfunding platforms provide the simplest and most understandable interface for the average user, without signing a large number of documents, personal presence and complex structuring.

Given the dynamic development of crowdfunding and increase number of crowdfunding platforms in the world, this method of financing has good prospects for application not only in the financial markets of economically developed countries, but also in Ukraine. This is facilitated by the variety of types of crowdfun-

ding and the advantages of collective financing, which allows taking into account the interests of project authors (startups) and investors, ensuring transparent and efficient financing. The main role in the crowdfunding process is assigned to specialized Internet platforms. The crowdfunding platform is a specially developed platform on the Internet, which makes it possible to collect, process, store and transfer significant amounts of data and funds received from investors. These platforms play the role of an intermediary in concluding contracts between investors and project developers. The activities of such platforms, in accordance with the legislation in each country, have their own characteristics and can be carried out differently. Some platforms analyze projects before submitting them to the competition and eliminate dubious projects, others only connect companies and investors. There are also options when the platforms, on the contrary, act as the sole owners of the investors' share in the financed enterprise, there are also those that impose certain requirements on their participants, for example, citizenship or legal status. Today, the largest international crowdfunding platforms are Kickstarter, IndieGoGo, Boomerang, RocketHub, ArtistShare and others.

Crowdfunding platforms in Ukraine. The direction of kickstarter Ukraine is still being formed. But there are already several sites that help to find funding for startups and charity events. Meetings reach considerable values. There are distinct models in the Ukrainian economy crowdfunding depending on the reward for sponsor:

- without reward (donation): people simply donate money for the implementation of an idea, without obligations on the part of its author;

- non-financial reward (“Kickstarter” model): it can be postcards, a video expressing personal gratitude, a mention in a sold product, etc.;

- financial reward (crowdinvesting): in this case, large investors receive a percentage of income and sales. Most often, this type of crowdfunding is used to finance films, game and application development, and music albums.

Shared cost. The platform is adapted for charity or socially significant projects. Meetings on ideas that are not aimed at making a profit, but are capable of changing life for the better, close well. In total, more than 1,2 million EURO are collected per year through Spilnokosht. The platform takes a commission of 10%. If the required amount could not be collected, the funds are returned to the benefactors.

RazomGo. The platform was founded in 2018. It is focused on collecting funds for projects in the direction of education, health care, games, sports. Pre-campaign training is provided, which makes it easier for beginners. There are no time limits for meetings. The author independently establishes this period.

If you look at the number of organizations that raise funds using crowdfunding, then, despite the small development of this industry in our country, you can clearly see their growth. In particular, the "Renaissance" International Foundation within the framework of the "EU4USociety" project in cooperation with the European Union 02.02.2022 the competition "Crowdfunding for social entrepreneurship" was announced, the purpose of which is to strengthen functioning social enterprises, popularization of social entrepreneurship and creation of a positive practice of attracting community funds by social enterprises.

Participants of the competition can be public organizations, unions, associations, societies and others associations registered in accordance with Ukrainian legislation as non-profit or charitable organizations.



## CONCLUSIONS

For the successful development of crowdfunding in Ukraine, it is necessary to improve the regulatory and legislative framework, in particular, in terms of the protection of investors' rights, due to the existing risks of entrepreneurs not fulfilling their obligations; promote financial literacy among the population, develop financial management and business planning skills among startup founders through the organization of trainings and courses. A feature of domestic realities is the lack of potential investors and low activity of entrepreneurs, as they need a favorable ecosystem. That is why it is important to create and actively develop domestic crowdfunding platforms is to further develop and creation of the necessary conditions for crowdfunding in Ukraine, in particular, ensuring a far-sighted legal regulation of such activities, implementation of effective technological solutions, as well as providing the basis for the development of trust and culture necessary for this new innovative tool for accumulating financial resources.

In our opinion, crowdfunding, in case of successful solution of the mentioned problems, is able to create competition to traditional financing methods offered on the market of financial services. In addition, such platforms contain certain requirements, compliance with which is mandatory before starting to attract investment / financing. In particular, there are requirements for the presentation of the project, relevance, team, budget, terms, purpose and mechanism for implementing the idea.

Crowdfunding as a source of financing for small businesses is an effective mechanism thanks to which developers of ideas can present their own project to a wide range of investors, and the latter, in turn, have the opportunity to participate in the implementation of a certain project by investing, or donating, their own resources, most often are financial. By its characteristics, crowdfunding is not inferior to its alternatives, and according to certain indicators, it is much more efficient and convenient.

The digital environment transforms the usual business models and promotes the creation of new ones, the functioning of which involves the use of digital platforms for the development of collaborative forms of work with market participants and the active involvement of entrepreneurs and end consumers in the business processes.

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## FUNDAMENTALS OF MICE TOURISM DEVELOPMENT IN HOSPITALITY INDUSTRY

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### **ABSTRACT**

*The main fundamentals of MICE tourism development in hospitality industry are explored. The concept of business tourism is substantiated. The main motives of foreign tourist's business travel to Ukraine are highlighted. The development of the world's latest technologies in electronics and satellite communications for business tourism using modern innovative technologies are investigated. The difference between Business travel and MICE-tourism is defined. The main criteria as the specifics of the service, the direction of the service, the attributes of the service of Business travel and MICE-tourism are proposed. The different types of interaction between the studied categories of Business travel and MICE-tourism are systemized. The common differentiation of MICE-tourism management system is researched. The unified classification of MICE tourism elements is proposed. The specific classification of international conferences, seminars, meetings and exhibitions is substantiated.*

**Keywords:** MICE tourism, business tourism, hospitality industry.

### **INTRODUCTION**

Business tourism is one of the largest segments of the global tourism industry, characterized by special requirements for travel organization, a formed consumer profile, a long-term impact on the national economy and high standards of transportation and communication infrastructure. Business travel or MICE-tourism is considered one of the most profitable types of tourism for organizers, moreover it stimulates the development of other types of tourism, as well as the activity of unrelated branches of the national economy.

The demand for high-quality MICE tourism services is constantly growing. That is why our local market should introduce new services for business tourists. This target audience prefers specialized business hotels that could provide diversified business center that should provide many business services including entertainment programs. The role of congress hotels in the development of Ukraine's business infrastructure is growing. This type of hospitality institution is rapidly gaining popularity.

Textbooks, scientific manuals, works of domestic and foreign authors were used in writing the thesis. Business tourism in its specificity has become the subject of research of such domestic scientists as: Abramov V.V., Andrenko I.B., Bezugliy V., Bilozorov A., Brych V. Ya., Garbera O., Dekhtyar N.A., Daydechko L.P., Dzyublenko I.M., Golovko O.M., Kalchenko O.M., Kosiy T. M., Kruchek O.A., Kyfyak V.F., Lau Chloe as well as Malinovska O.Yu. At the same time, the study of scientific works shows that some of the theoretical provisions regarding the interpretation of the concept of MICE tourism are debatable, and a number of important aspects of the development of business hotels in Ukraine and the organization of MICE events in the hotel establishment need improvement, which led to selection of the research topic and its relevance.

### **METHODS**

Research methods. The methodological foundations of this paper are the provisions of economic theory, scientific works of domestic and foreign economists, which relate to the development of MICE tourism in the hotel business. The following research methods were used in the paper: logical and theoretical (when studying the essence and classification of MICE tourism); historical (when systematizing the development of business tourism over time); statistical, prognostic and economic-mathematical methods (when studying the

current state of development of business hotels in Ukraine); system analysis and synthesis, generalization (when investigating problematic aspects of the development of business hotels in Ukraine and improving the quality of business services in the investigated hotel).

In the process of studying the organization of MICE tourism, various research methods were used, such as analysis, synthesis, comparison and grouping of data, causation.

## RESULTS

### **Characteristics, essence, role and importance of business tourism in the hospitality industry**

Business tourism is one of the most notable phenomena of the XXI century and is a major segment of the hospitality market. It has an important role in raising the rating of any country. The research on the development of business tourism is relevant, because it's one of the most profitable industries in the world today.

There are different definitions of the concept of "business tourism". The most common definition is the following: business tourism is a trip of people, most often businessmen and civil servants for business purposes: signing agreements, contracts, negotiations, consultations, exchange of experience, etc. [2].

Certain authors describe it as temporary trips with business purposes, including participation in conferences, congresses without income at the place of business [7].

Domestic authors define the concept of "business tourism" as journeys related to professional duties [3], and according to O.A. Smirnov business tourism is a set of relationships and phenomena that occur when moving and locating people during working hours, the main motivation of which is to attend and participate in various business meetings, congresses, conferences, exhibitions, fairs and incentive events in places other than their usual place of residence and work [4].

Another piece contains the following definition of business tourism: "... touristic trip for business purposes with no gratification received while abroad" [15].

The analysis of various definitions of business tourism allows us to conclude that it corresponds to the concept of business travel - a trip with business and professional purposes during working hours without income at the place of residence. Thus, business tourism is a set of relationships and phenomena that occur while people travel during their working hours, the main motivation of which is to participate in business meetings, congresses, conferences, exhibitions, fairs and incentive events in places outside their usual residence and work.

Business tourism has a very deep history, which is closely linked to the history of human development. Human activity from the first days of its existence was due to the need to move from one place to another. Historically, modern tourism has been the result of the emergence and evolution of travel [12]. Travel had a significant impact on trade, culture, and art of ancient civilizations. In most cases, trade was the engine that contributed to the development of business tourism. The presence of water and land routes by which merchants went to foreign and overseas countries facilitated the first business trips. But, at that time, the merchants who sold their goods and spent a lot of time in other cities and countries, did not even think about what to call his trip.

In their research on the history of tourism, scholars identify several eras of tourism development that can be linked to the development of business tourism. These are the pre-industrial era of socio-economic development of society, which covers the times of antiquity, the Renaissance, as well as the Early Modern Period. The distinction of traveling at those times was that the trips had a pronounced business purpose. The goal of travelers was to organize trade, open new lands, capture new markets [4]. Exchange and trade became the essential purpose with the advent of the division of labor. People traveled to discover new places and expand their knowledge about the world around them. Initially, the cognitive motive was of secondary importance, but over time it has become an independent goal of travel. Economic needs and humans' curiosity were the first motives to travel, many of them are reflected in ancient epics that have survived to our time [13].

We have information about trade relations between different peoples of the ancient East from sources that are 5 thousand years old. The first king of the Sumerian dynasty began trade relations with the North and the South. Ancient Oriental caravans filled India, Armenia, Arabia, Persia, and Medes with Babylonian carpets and dyed cloth, pottery, and weapons. The caravans returned with gold, precious metal and stones. Thus, the Babylonian merchants were the first business tourists of the ancient East [7].

Mostly maritime trade developed in ancient Phoenicia. Phoenician ships ruled the Mediterranean from the middle of the second millennium BC. [1]. The Phoenicians made their first sea voyage between Gibraltar and the Pillars of Hercules, and built a shopping center in Cadiz in 1100 BC. [6]. Then Phoenician sailors sailed along the coast of Spain to the north and along the west coast of Africa to the south, where they loaded their ships with fruit, wood and metal, and then sailed to India, Arabia, Palestine, Egypt, Greece, where they took wine, wool, grain and oil. This was the beginning of maritime business tourism [7].

In the ancient Persians, trade became even more widespread. Thanks to the introduction of money and the construction of roads, the possibility of free transportation of goods and people within the empire, travel for various purposes are now becoming a characteristic feature of its inhabitants. The business relations of the Persians were already reminiscent of modern ones.

The oldest courier and postal road in Persia was built under King Darius I. Roads connected Susa with Ecbatana, the capital of Medes, and Babylon. The length of Persian roads was more than 2100 km [1]. The first signs of business tourism in Ukraine were mentioned in the papers of Herodotus, Strabo, Arian, Hippocrates, Polybius, Claudius Ptolemy, Tacitus, who noted that the active development of trade was facilitated by the construction of seaport cities that gave Greek travelers the opportunity to visit new lands.

In the history of business tourism in the Ancient East, the most important event was the appearance of the Great Silk Road in the second century. B.C. It started from Sinai via Lanzhou to Dunhuang. Then it forked – its northern part went to the Fergana Valley, and the south, crossing the Pamirs, led to India and the Middle East. Merchants usually spent 2-3 years on the Great Silk Road. They gathered in caravans while traveling in the Ancient East. On the caravan routes tents were set up for travelers or caravanserais, which, unlike tents, were more equipped and protected merchants from sandstorms and robbers [1].

In the Middle Ages, the development of trade led to the emergence of travel to sell goods outside the place of manufacture [13]. The organizers of the trips were often merchants. They not only paved new trade routes, but also enriched their knowledge of new countries and lands. Among the travelers of the early Middle Ages an important place was occupied by the inhabitants of the Scandinavian and Jutland peninsulas, known as the Vikings. Extensive fishing and trade contributed to the active development of navigation among the Normans. The influence of the Vikings extended due to the development of trade [1].

The Hanseatic League, which finished its formation in the 14th century, had an important role in the development of business relations in Europe. In the middle of the XV century the Hanseatic League included more than 100 major cities. Thus, the cities of Mainz, Cologne and Lubeck, taking advantage of Germany's location on trade routes, began to actively develop through trade, and the Hanseatic League became a monopoly intermediary between areas of Northern, Western, Eastern and Central Europe. Trade began to flourish, merchants traveled around the world. The active work of the Hanseatic League has contributed to the spread of business travel, primarily to study the experience of conducting trade transactions. Genoese and Venetian merchants started paying attention to Central Asia, India and China.

The most desperate ones left looking for new trade routes. Brothers Niccolo and Marco Polo in 1260 made a journey from Constantinople through the Crimea, Bukhara and the mountain ranges of Central Asia. They spoke to the Mongol khan, whom they were able to convince about the benefits from trading with Europe. In 1269 they reached the shores of Italy. In the East in medieval times people traveled by camels, because they could withstand the heat of deserts and thirst. Traders used special fasteners to tie the goods to the camels and successfully made their business trips [1]. In medieval Ukraine' business tourism was actively developed due to its favorable geographical location. One of the most famous was the trade route "from the Vikings to the

Greeks", connecting the Black and Baltic Seas and the Volga Great Trade Route, which stretched from Novgorod along the rivers Lovat, Western Dvina, and the Volga to the Caspian Sea. In the XVI and XVII century. one of the main shopping centers was Kyiv. Caravans from Poland, the Crimean Khanate, Turkey, Moldavia, Hungary, Greece, Eastern and Western Europe marched to the Grand Duchy of Moscow. Zaporizhzhya Sich also conducted active trade with neighboring countries and was a transit point in trade of all Ukrainian lands and Moscow with the East [1].

In the XV century, during the Renaissance, when the economy began to grow rapidly, new crafts appeared, trades between countries expanded, business tourism was formed as a phenomenon and received a strong impulse for development [8]. However, until the middle of the XIX century, business tourism was predominantly commercial.

From the second half of the XIX century, the second epoch of tourism development began, when the first generalizations of tourist practice appeared [4]. German researchers suggest considering the entire XIX century as a period of elite tourism, when it was very prestigious to make business trips. At this time there were serious changes in the socio-economic nature, as well as this time not only industrial but also scientific and technological revolution. The popularity of business tourism began to grow with the advent of a more developed transport industry. Construction of railways, maritime transport, construction of hotels, energy supply, the birth of communications (telegraph and telephone) - all these aspects of life have become a stimulating link in the prosperity of business tourism. People began to communicate more and it led them to travel more. Tourism started becoming widespread.

Foreigners from another continent no longer caused aggression and opposition among locals. In the first half of the XX century, Germans, Americans, and Japanese were excited about tourism [13]. In the 1950s, with the advent of jet aircraft, business tourism invaded people's daily lives. Airplanes made the few-hour trips to another continent very convenient, which sub served the spread of business travel. In the West, business tourism was talked about as an independent type of tourism in the late 1970s - early 1980s, when the world tourism business began to use special terminology related to business travel as a highly profitable segment of the industry [8]. Today, business tours are in demand all year round, because the work does not stop. Modern humans have all the opportunities to find a business partner abroad. Business trips don't only mean leisure in foreign countries, but also the discovery of new opportunities and skills for business growth and prosperity. Conferences, exhibitions, seminars develop human intellectual abilities. Business trips help entrepreneurs to generate brand new ideas while exchanging experience with foreign partners.

Currently, one in four tourists travels due to business needs. And the whole huge sector of travel made for a variety of business purposes is called business tourism. In the beginning of the XXI century business tourism is firmly established in many countries as the fastest growing economic sector, providing foreign exchange inflows and job creation, increasing demand for various sectors of the tourism industry, development of economics, science, education, culture and health [8]. Thus, in the pre-industrial period, business travel was an integral part of the history of ancient civilizations. Initially, such trips were commercial in nature.

The Egyptians, Persians, Phoenicians, Greeks, and Romans established trade relations with other peoples. The first centuries of our era were favorable for travel: convenient roads were well guarded, Roman money was accepted everywhere, Latin and Greek were understood in most countries, the borders were transparent.

The early Middle Ages were marked by difficult conditions for business travel. Feudal disunity of territories, numerous threats on the roads, robbers and pirates, poor condition of roads and imperfect transport – all of these factors hindered the development of travel.

At the same time, the infrastructure of the feudal states required constant connections, which were provided by travel. At this time, the business travels of merchants were given considerable attention. This was a period of great migrations, military campaigns and conquests, which helped increase the mobility of the masses. Very often the motives of travel were intertwined: trade was combined with cognitive motives,

religious motives stimulated conquests, which also contributed to the discovery of new lands, peoples and cultures. At the end of this period, the process of discovering inhabited continents was almost complete.

During the second period, the largest rivers and lakes were explored and mapped, the reliefs of the continents were determined, and their borders were delineated. In these processes, a significant role was played by the great powers of the time, engaged in the search for new territories for trade, such as the Netherlands (Netherlands), England and Russia. Tourism has begun to become a significant social phenomenon. Business travel, stimulated by the development of large monopolies and the international nature of trade, continued to develop actively, developing new markets for investment. At the beginning of the XX century. masses of Europeans began to travel to the New World in search of work, while expanding the labor market.

Today, business tourism plays a significant role in international and domestic tourism of Ukraine and is a promising path of tourism development in our country. Foreign experts believe in the potential of foreign tourists to travel to Ukraine, highlighting the following motives:

- history, culture and art of our country, the diversity of nature and national characteristics are of a great interest to the foreigners;
- the desire of foreigners to get acquainted with the modern life of Ukrainians and with the political and economic and social changes in Ukraine;
- significantly simplified visa, border, customs, currency and other formalities for foreigners;
- openness of Ukraine, freedom of movement of foreigners on the territory [9].

But foreign tourists note a number of shortcomings that negatively affect the potential demand for tourist trips to Ukraine. This is primarily a difficult political and socio-economic situation in our country; limited material and technical base of the hotel industry, which began to develop properly only during the preparations of Euro 2012. Still, the volume of international contacts connecting Ukraine with foreign countries is constantly growing, so the priority for the development of hotel business in Ukraine is the construction of comfortable, conveniently located hotels that increase their quantity in large industrial and cultural centers of Ukraine every year. Newly built hotels are already equipped with everything necessary for business and MICE tourism, and the old hotel facilities are modernized taking into account the requests of businessmen [9].

Today, about twenty travel agencies are engaged in business tourism development in Kyiv. They provide various services to business tourists: meeting and picking up from the airport, transportation around the city, hotel reservations, rental of conference rooms, office equipment, catering, cultural and sports leisure, purchase of all kinds of tickets, including those that take the businessmen back home. Not only travel companies and hotels, but also airlines are trying to meet the needs of business tourists in Ukraine. By improving the flight schedule, they help business tourists to optimally build their schedule, using, for example, night flights.

The development of the world's latest technologies in electronics and satellite communications requires business tourism organizers to hold business conferences in Ukraine using modern innovative technologies: invitations to conferences and conventions are sent to business travelers online. It is used to acquaint business tourists with the conference or congress program, provide an opportunity to remotely monitor speeches and even participate in discussions and voting. Business people working in various fields, including science, not only expect the conclusion of new profitable contracts from business trips, but also increase creative activity through new unforgettable impressions of our country and its national specifics [9].

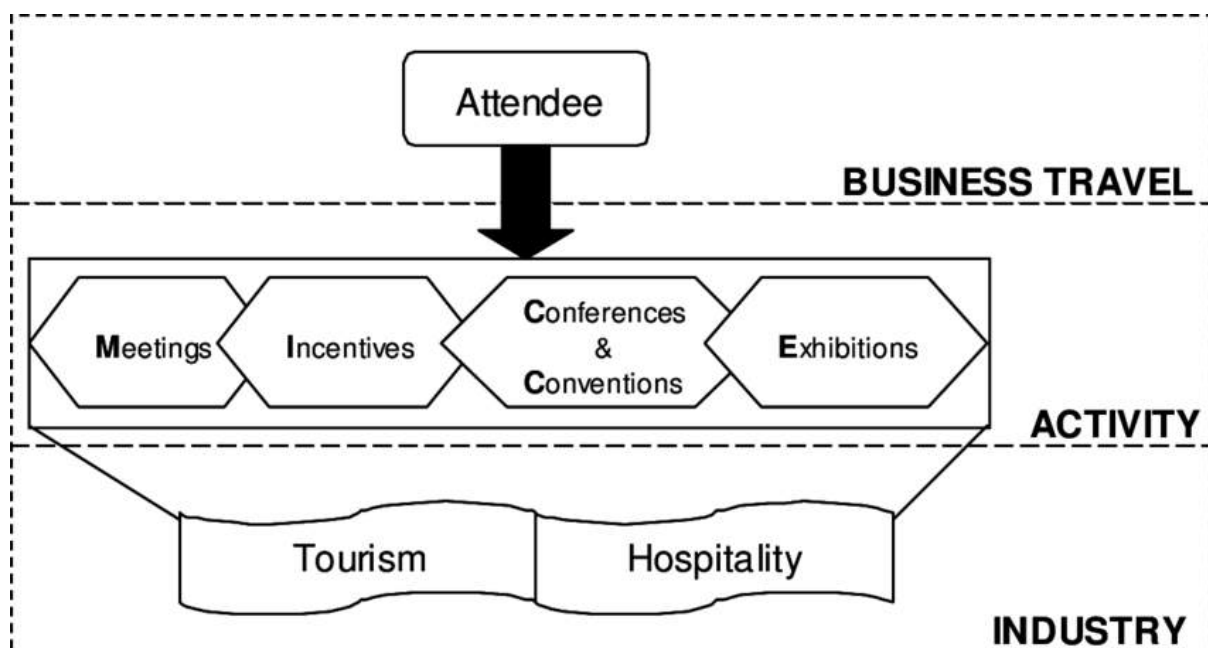
It is believed that in the future business tourism in Ukraine would develop on the basis of a special Ukrainian national identity so the business trip will become a pleasure and help increase efficiency and creativity. But the main thing is the friendly attitude of business tourists to Ukraine and the desire to visit it again. Unfortunately, the current conditions of business tourism in Ukraine often won't provoke such a

feeling. Thus, for the effective development of international business tourism, it is necessary to improve the political and socio-economic situation in Ukraine and create the conditions for business people.

In order to do it, modernizing and developing the material and technical base of business tourism infrastructure is a necessity, as well as training of high-level specialists to provide services for business people. Particular attention should be paid to promoting domestic tourism products abroad and creating a positive image of our country.

**The concept of MICE-tourism and its classification features**

In recent years, scientists and practitioners, whose subject of study and activity is the service sector, note the increased and growing interest in business tourism (business travel). However, the analysis of the variety of terms used by experts allows us to conclude that there are different, often contradictory interpretations of the category of "business tourism" (Fig.1).



**Fig.1. Business travel vs MICE-tourism**

Source: [14].

Along with the concept of business travel (English business trip) today is often the MICE tourism concept. The first letters of the English abbreviation MICE indicate the structure of this type of tourism: Meetings - M, Incentives - I, Conferences - C, Exhibitions - E [10].

The categories of business travel and MICE-tourism have many common features, but in fact they are somewhat different. To find out what is free and what is different in these categories, it is worth considering concepts such as travel and tourism. Travel is the movement of people in time and directly in space, and the person who actually makes the trip, a traveler, regardless of the goals or direction, as well as means of transportation and time intervals. Travel is the movement of people in a certain area to get acquainted with and expand the worldview, and the purposes of travel can be both general and cognitive or sports. Thus, the main feature of the term "journey" is the movement of people in space, regardless of the purpose of such movement.

In the study of the concept of "tourism", all definitions can be combined into three groups. The first group includes definitions that reveal tourism as a form of recreation, i.e. the impact of expanded reproduction of physical, intellectual and emotional forces on a person, as well as the system and form of leisure through the use of tourist services in hiking or travel, which can combine active recreation and strengthening

human health in order to improve its general culture and education. The Manila Declaration on World Tourism considers the concept of "tourism" as one of the forms of active recreation, which consists in making trips to explore and get acquainted with certain areas, new countries [5]. Such definitions are highly specialized and apply only to certain areas of tourism or its specific components. The second group defines tourism as one of the types of population migration and connects it with the process of movement, travel, overcoming distances and acts as a mechanism of tourism statistics. The third group characterizes tourism as a rather complex phenomenon of socio-economic nature, reveals its inner essence and is expressed in the unity of diversity of properties and relationships.

Thus, travel and tourism are similar concepts, while travel is a broader concept, and tourism has a specific purpose and a special way of life in the places visited.

The above allows us to study the relationship and relationship of another pair of concepts: business travel and business tourism. Consider the two most commonly used business travel concepts. First, it is a trip, the purpose and location of which are set by the business, and all costs are reimbursed by the company. Secondly, travel, business and government tasks provide a secondary motivation for rest [11]. The above definitions allow us to conclude that the business goals of travel are the key word in the concept of "business travel", and tourism goals are considered secondary and not mandatory. In other words, business travel does not directly agree with tourism. It is no coincidence that the concept of "business tourism" does not exist abroad, but the concept of "MISE-tourism" is used.

To determine the differences between the concepts of business travel and MICE, we also use such criteria as the specifics of the service, the direction of the service, the attributes of the service.

a) Specifics of the service. When conducting business travel, the agency is not responsible for its content. The agency's task is to provide travel support (visas, hotel reservations, tickets, etc.). The MICE event is not only organized by a mediator (specialized agency), but also organized by him. The professional organizer independently forms the program.

b) Direction of service. Business travel events can be conditionally attributed to the scope of protocol activities. The MICE events are at the intersection of protocol and internal PR.

c) Service attributes. The attributes of business travel include the ability to optimize travel expenses, compliance with the rules of business travel, compliance with the principle of just-in-time. MICE attributes include all business travel attributes, but also creativity, mood and individuality.

A business traveler, when making a business trip to one of the above activities, one way or another interacts with the MICE industry. However, when there is a tourist motivation, i.e. the need for recreation, entertainment, cultural and cognitive purposes, a business traveler who came, for example, to the exhibition, acquires the status of a business tourist. Thus, we have identified three types of interaction between the studied categories of business travel and MICE-tourism:

MICE + tourism = business tourism;

BT + tourism = business tourism;

BT + MICE = business trip.

In the first case, the business tourist travels to events held by the MICE industry, with the secondary purpose of recreation and entertainment. In the second case, the business traveler makes a business trip (business trip) on behalf of the company, while he is given time to implement cultural, cognitive and recreational goals. In both cases we can talk about business tourism. The last relationship involves combining a business trip with attending MICE events on the company's mission. In this case, it is more appropriate to talk about a business trip.

Practically, MICE-tourism covers a wide range of trips, including individual business trips of company employees for negotiations, participation in production meetings, presentations and sales activities, as well as congress services - trips to congresses, conferences, seminars. MICE-tourism also includes trips to exhibitions, fairs and exchanges, and trips to team sports, tours and official delegations. Also, among the types of



business tourism there is incentive tourism – a form of incentive companies gives to their employees in the form of organizing a free tourist trip for them [5].

To ensure effective management of MICE-tourism it is differentiated:

- by the number of groups of travelers: individual and collective;
- by form of organization: unorganized – business trip to a company, organization, institution; organized – related to trips to pre-planned events within the MICE);
- by length of stay: short-term – 1 day, individual business tourism; medium-term – 2-3 days, incentive tourism; long-term – more than 3 days, incentive tourism, exhibition tourism;
- by distance from permanent residence: domestic and outbound [11].

The unified classification of MICE tourism does not exist. Therefore, we should take into account the realities of recent times, to classify it as the following features:

- political component: visits, congresses;
- scientific component: forums, conferences, congresses, symposiums, seminars;
- commercial component: exhibitions, fairs;
- professional component: business trips for professional purposes, incentive tours, trips of sports teams to competitions, trips on tour;
- social component: meetings, gatherings.

According to the nature of the reception, visits are divided into governmental, official, working and informal. Visits of delegations and statesmen by invitation to the anniversary holidays are sometimes singled out. Visitors are being housed in accommodation establishments, but in most cases those are not hotels.

During informal, working and individual official visits, delegations can be accommodated in hotels where hotel conference rooms are used for events. Visits are a means of realizing many other forms of diplomatic activity, such as international congresses, conferences, forums, and congresses.

A congress is a meeting of representatives of any organization or community group that has a common goal, such as a meeting of political party delegates to shape policy and elect governing bodies. A congress is a congress, assembly, or meeting, usually of an international nature; a formal meeting of delegates who are usually relevant to a particular field of human activity or involved in a particular field to discuss various issues.

A symposium is a meeting; a conference on a special scientific issue; a meeting on any scientific issue (often international); an event accompanied by a casual conversation; a formal meeting where experts make short presentations on a specific topic or several related topics; or a scientific meeting, often international.

A conference is a meeting of representatives of any state, organization, group, or state, as well as individuals and scientists to discuss certain issues, i.e., a formal exchange of views at a meeting to discuss common issues for all participants [11].

International conferences (congresses) are also a traditional form of diplomacy and are meetings or meetings of delegations of different countries, convened to study and solve problems. The terms "international congress" and "international conference" are considered identical, although previously used as different or equivalent.

International conferences are classified according to various criteria depending on the purpose, objectives of the meeting, the scope of activities of participants, their rank, form of organization and conduct, etc.:

1. Subject matter: political or technical.
2. Purposes: advisory, legislative, or informational.
3. Type of organization process: bilateral or multilateral; special or ordinary.
4. Participant rank: the highest level; high level; intermediate level;
5. Participants' positions: general and closed-door;
6. Purpose of conducting: diplomatic or plenipotentiary; preliminary or expert [5].

The seminar is practical classes held in groups under the guidance of a professor at the university or the tutor in group classes, for example for training. The purpose of the seminar is to make students discuss the current topic under the guidance of the curator.

The following types of seminars are conducted in modern science:

- a seminar of questions and answers;
- a seminar - detailed conversation; involves thorough preparation on the issues under consideration;
- a seminar that provides oral answers followed by discussion;
- a seminar-discussion based on the principle of a round table;
- a seminar that involves discussion and evaluation of the prepared abstracts;
- a seminar-conference;
- a problem-solving seminar;
- a seminar - classes for manufacture workers
- a seminar - press conference;
- a seminar for brainstorming;
- special seminars
- scientific seminars in the specialty [5].

A meeting is the joint presence of people united by something, like members of any organization. A meeting is arranged in order to get acquainted or to have a conversation with someone. The exhibition is a show, the main purpose of which is to provide potential customers with complete information by demonstrating the tools available to society to meet the needs of one or more of its areas of activities or its future prospects.

A fair is an economic exhibition of samples, which, according to the customs of the country in which it is located, is a significant market for goods or services that operates on time for a limited time in the same place, and where exhibitors are allowed to present samples of their products for concluding trade agreements on a national or international scale. Exhibition and fair events are classified according to the following characteristics:

- a) for the purpose of: trade; informational-introductory;
- b) by frequency: periodical, annual, seasonal;
- c) by the nature of the exhibits offered: universal, multidisciplinary, industry-related, specialized;
- d) by composition of participants: regional, interregional, national, international [11].

The classification of MICE tourism is very important for the development of the hotel industry. Knowledge of the structure of the business segment of hotel customers will allow you to most accurately identify it in the segmentation of hotel customers, identify its needs, and focus their services on it. So, today the most common category of guests at the hotel establishments are business tourists. In many countries, MICE tourism is widely used to encourage employees. However, a significant source of increasing hotel revenue can be not only the accommodation of this category of guests. The most promising is the provision of premises for various business events-conferences, seminars, classes, exhibitions and presentations, etc.

## CONCLUSIONS

The demand for high-quality MICE tourism services is constantly growing. That is why our local market should introduce new services for business tourists. This target audience prefers specialized business hotels that could provide diversified business center that should provide many business services including entertainment programs. The role of congress hotels in the development of Ukraine's business infrastructure is growing. This type of hospitality institution is rapidly gaining popularity.

For the effective development of international business tourism, it is necessary to improve the political and socio-economic situation in Ukraine and create comfortable conditions for business people. In order to

do it, modernizing and developing the material and technical base of business tourism infrastructure is a necessity, as well as nurturing high-level specialists to provide services for business people. Particular attention should be paid to promotion of domestic tourism products abroad and creating a positive image of our country. In the future, despite the current difficult political situation, MICE-tourism will continue to play an important role in the development of the national economy and will stimulate its integration into the international market. Ukraine will continue to grow and, as a result, business, cultural, and scientific ties with other countries will develop. Thus, developing a program of MICE-tourism phased development and promotion is important for Ukraine, since the implementation of one will bring a significant share of profits and taxes all year round and create a significant amount of jobs. The most important task is to reorganize business tourism, expand the range of hotels' and resorts' services, and improve the quality of services for business travelers.

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## FEATURES OF THE DEVELOPMENT AND USE OF MODERN METHODS OF PEDAGOGICAL CONTROL OF SPECIAL PHYSICAL FITNESS OF ATHLETES

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### **ABSTRACT**

*Progress in the field of theory and methods of sports requires the development of modern control methods that allow measuring certain parameters of athletes' preparedness with high accuracy. The need to find new approaches to solving this problem is a requirement of today. The use of scientific and technological progress in sports is a reality that needs to be considered. An important problem facing scientists and sports practitioners is the need to improve the monitoring system through the introduction of new innovative approaches and modern technologies. The development and implementation of new control technologies requires the implementation of special electronic devices in this process, which should ensure the objectivity and accuracy of the results obtained. This work is devoted to the problem of creating approaches to a unified system for controlling the physical fitness of athletes. The paper offers techniques by which with high accuracy and objectivity it is possible to assess the level of some sides of athletes' physical fitness based on the use of modern nanotechnology and microprocessor systems, which is very important for the theory and practice of sports.*

**Keywords:** *sport; training of athletes; test control; modern nanotechnology.*

### **INTRODUCTION**

Basketball is an athletics game that places high demands on the physical fitness of athletes [1, 2, 3, 4]. Participation in the game requires the athlete to mobilize his physical and functional capabilities. The physical training of basketball players in modern basketball is of particular importance due to the expansion of the range of their game activities, an increase in tension in the game, which requires athletes to maximize muscle effort in situations that change rapidly during the game [5, 6, 7, 8].

In order to effectively increase the physical capabilities of athletes, in particular basketball players, it is necessary to know the following: what requirements the game itself puts on the individual functions of the body and the physical qualities of basketball players, how great are these requirements, what are the physical capabilities of basketball players, what physical and functional qualities in the first place it is necessary to pay attention in the process of training, what means and methods of training are most effective for the development of certain qualities, how to rationally build a training process [6, 8]. Therefore, the question of establishing criteria functions and physical qualities of basketball players is very important in order to manage effectively the training process. Moreover, effective management of the training process is impossible if the following tasks are not solved [7]:

1. Creation of a unified system of accounting and analysis of training loads.
2. Determination of the most effective means and methods of training.
3. Optimization of the training process construction.
4. Development and unification of the system of control over the training of basketball players and the level of their physical preparedness.

This work discusses issues related to the development and unification of the system of control over the physical preparedness of basketball players.

The purpose of the study is to develop a system of control of special physical preparedness of basketball players based on the use of modern nanotechnologies and microprocessor systems.

## LITERATURE REVIEW

Studies have shown that monitoring the special physical preparedness of basketball players is very important for effective planning of the athletes' training process [2, 6]. When planning the training process of basketball players for certain short or long-term (several years) periods, the question of choosing criteria by which it is possible to determine the course of training in the context of changes in the physical fitness of athletes becomes important. These issues are constantly in the field of view of specialists [9, 10, 11]. Nevertheless, modern basketball requires the implementation of new approaches in this process, the use of modern, fundamentally new approaches to the problems of test control, the need to take into account the development of information and communication technologies. Integration of innovative approaches to control the physical fitness of athletes is a requirement of today. Development and unification of means and methods of control of physical fitness in sports games is a powerful means of increasing the efficiency of the training process [2, 9, 12].

For a long time, the question of finding methods for determining the level of special physical fitness has been the focus of many researchers. The development and unification of the basketball players' training monitoring system has been the subject of research by many scientists and practitioners in this field of sports [9, 13, 14]. In basketball, a certain system of control over the athletes' fitness has been created [6, 15]. Tests are usually used for the following purposes:

1. Identifying the level of development of certain qualities and skills in basketball players of one or different qualifications, one or different age groups.
2. Monitoring the effectiveness of training tools and methods.
3. Control over the dynamics of basketball players' sports skills during a certain period.
4. Selection to a sports section or team.
5. Control over the training of basketball players in the process of preparing for competitions. This makes it easier to create training programs and more efficiently manage the training process.

## RESEARCH METHODOLOGY

It should be noted that in the historical aspect, the proposed tests and, most importantly, the methods of determining the parameters of basketball players' preparedness have been improved over the decades due to technological progress. At the beginning, ordinary roulette, stopwatches, etc. were used for such tests [2, 3, 4, 8]. Then electronic stopwatches, photofinishing devices were used [5, 6, 16]. The use of these more technically improved devices has affected the quality and accuracy of the results of research. Nevertheless, one of the promising areas of improvement of control is the development and practical implementation of new, highly effective means, methods, and technologies of integrated control and management of this process. The need to implement these innovations, fundamentally new approaches to the development of the theory of test control in sports and, in particular, in basketball, which would meet modern scientific ideas, is due to the requirements of innovative development, and the global development of information and communication technologies causes the need for significant changes in the forms of organization of test control over the training of basketball players [6, 17, 18].

Therefore, on the basis of modern nanotechnology and microprocessor systems, a new system for determining such parameters of physical fitness as: assessment of special speed endurance, speed-power capabilities, movement techniques and special endurance of basketball players has been developed and implemented into basketball theory and practice.

The method of pedagogical observations, graphic analysis method, and mathematical statistics were used in the researches. For calculating the indicators of 20 m running, the formulas proposed by Trafmon [19] were used, as well as modern nanotechnology and microprocessor systems to determine various parameters of basketball players' physical fitness. Capacitive sensor devices based on the combination of modern nanotechnology and microprocessor systems were used [18, 19, 20].

To maintain a laboratory journal, to perform operations for storing the obtained research results and sorting them, and for calculating statistical data, the MS Excel program was used. The choice of methods of mathematical statistics was adequate to the purpose and objectives of our study and included the use of the following methods: the arithmetic mean according to the initial data, the error of the average value and the reliability of the difference between the data obtained.

### **TESTS FOR THE STUDY OF PHYSICAL FITNESS OF BASKETBALL PLAYERS**

The existing methods of determining various parameters of physical preparedness of athletes do not meet the modern requirements of scientific and technological progress. A number of tests are offered to determine speed-power capabilities, special speed and special endurance based on the use of modern nanotechnology and microprocessor systems

#### *Method of determining motor quality "speed".*

Success in many sports and especially in sports games is ensured by not only a high level of technical, tactical, psychological, but also physical preparedness of athletes. The speed of the athlete's actions plays an important role in the aspect of physical training. It is clear that the effective conduct of the game of basketball, volleyball, football, handball and other gaming sports at a high pace requires appropriate physical training, including speed. The effectiveness of the game actions of athletes largely depends on the speed of simple and complex motor reactions, the speed of movement when performing of game [4, 15, 21, 22].

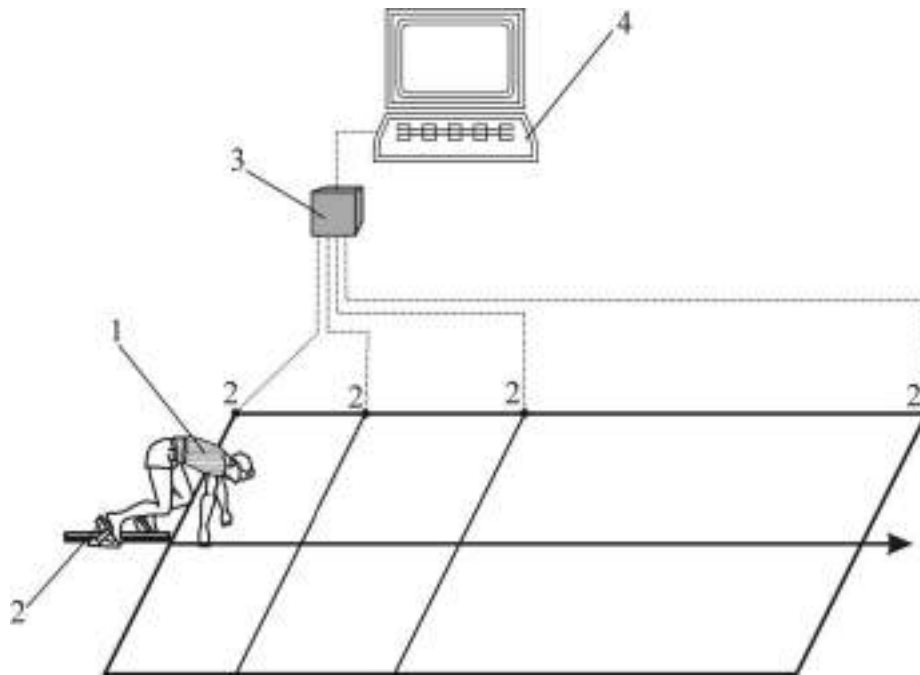
An important element in the process of training of athletes in game sports is not only the method of speed training, including special, but also the method of determining the level of development of this quality.

In sports games and, in particular, in basketball, a simple procedure for determining the level of speed development using a stopwatch has been used for a long time. A significant step forward, especially in basketball, was the method of determining the speed offered by V.Danilov [5] using a photofinishing device. With the help of this device, you can register a number of indicators that to some extent characterize the speed and power capabilities of athletes. This method has been widely used in basketball [6, 23].

The main disadvantage of this method, despite its progressiveness, is the insufficient accuracy of the measurement, which was not able to provide the equipment of that time.

The task of our work was to develop a device using modern technologies to determine the speed and power capabilities of athletes.

When creating a device for controlling speed and power abilities, we needed to ensure the possibility of fixation with an accuracy of thousands of seconds of time of overcoming certain intervals of distance. The developed device for determining the level of development of speed abilities (Fig. 1) includes: starting pads, three installations that are able to record and quickly transmit to a personal computer information about the time of overcoming distance intervals, with a resolution of 0.01 s. Capacitive motion sensors are placed on the starting pads, along the distance at the installations and on the object itself. An informative signal between two sensors that occurs when the subject passes the distance, allows you to register the start time, the time of overcoming each interval of the distance and the finish. The signal received by the sensors is transmitted to the microcontroller, where it is processed and transmitted to a personal computer through wireless communication devices (Bluetooth).



1 – subject of control; 2 – capacitive motion sensors; 3 – microcontroller; 4 – PC  
**Fig. 1. Constructive scheme of the means of speed control.**

The use of the developed device makes it possible to increase significantly the accuracy of the test results of speed control. Obtaining information with a high degree of accuracy allows not only to determine the time of overcoming the intervals of the distance, but also to calculate the speed of the starting acceleration, the maximum speed of movement and the starting force. On the basis of the results of mathematical calculations of indicators, it is possible to accurately and differentially estimate the speed-power abilities [5].

Therefore, based on the dispositions of the integrated approach, we propose to calculate other important characteristics using the method of mathematical statistics on the basis of the information obtained by the control, along with determining the time of overcoming the distance segments. This is necessary because overcoming short distances (20, 30, 40, 50, 100 m) with maximum speed is considered an insufficiently informative indicator of the level of development of speed-power abilities. It is important to characterize the level of development of these abilities to determine such characteristics as the speed of starting acceleration ( $K_c$ ), the maximum running speed at the distance ( $V_m$ ) and the starting force ( $F$ ). The exponential nature of the interdependence between speed and time in such exercises makes it possible to find a mathematical assessment of these indicators. To calculate the starting acceleration ( $K_c$ ) we use the exponential formula (1):

$$K_c = \frac{\lg Y_1 - \lg Y_2}{t_2 - t_1} \times 2,3 \quad (1)$$

where  $Y_1$  i  $Y_2$  – speed on distances from 3 to 5 m or from 3 to 6 m and on distances from 5 or up to 20 m, or up to 30,40,50 m depending on the chosen length of distance;

$t_1$  i  $t_2$  – time of overcoming the relevant distances.

The following equation (2) was used to calculate the maximum speed of running at the distance ( $V_m$ ):

$$V_m = \frac{Vt}{1 - e^{-kt}} \quad (2)$$

$Vt$  – speed reached by the time  $t$ ,  $k$  – speed constant that characterizes the starting acceleration;  $e$  – the basis of natural logarithms.

The following formula (3) was used to determine the starting force (F)

$$F = \frac{P}{g} \times Kc \times Vm \times e^{-kt} \quad (3)$$

where  $P$  – weight of the control subject;  $g$  – acceleration of gravity.

The indicators obtained from these mathematical calculations make it possible to carry out a differentiated and objective assessment of speed-power abilities.

*Assessment of special speed endurance*

The basketball player starts from the front line and runs to the opposite front line of the basketball court. Touching this front line with one foot, the athlete turns around and runs in the opposite direction, performing this cycle for 40 sec. The exercises are performed with the maximum possible intensity 3 times after 1 minute of rest. The number of meters that a basketball player runs in 120 s (3 x 40, after 1 minute of rest) is an indicator of the level of development of speed endurance of basketball players.

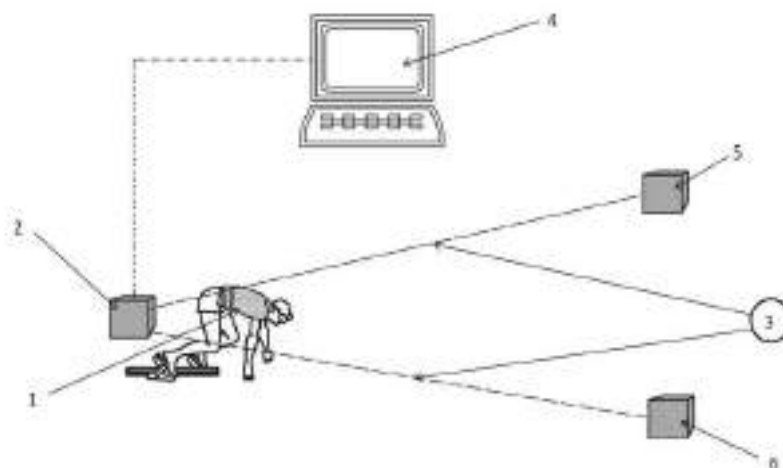
Before the test, the basketball court between the front lines is divided into 28 parts, 1 meter each, and special devices that transmit a signal to a personal computer when running a distance, are installed on each segment, which allows you to determine with high accuracy the number of meters overcome in 40 s of running.

The principle of using modern nanotechnology and microprocessor systems is described above in the section "Methodology for determining the motor quality "speed".

*Control of special endurance and movement techniques of basketball players*

To determine the special endurance and technique of movement of basketball players, the test "Movement of a basketball player in the rack" was used [6]. The test provides for control of the time and distance that the subject overcame (fixed segments), and touching the platform, by which the dynamics of tiredness is established.

In accordance with the task, a movement control device has been developed. Fig. 2. shows the structural diagram of the constructive solution of the special speed endurance control system.



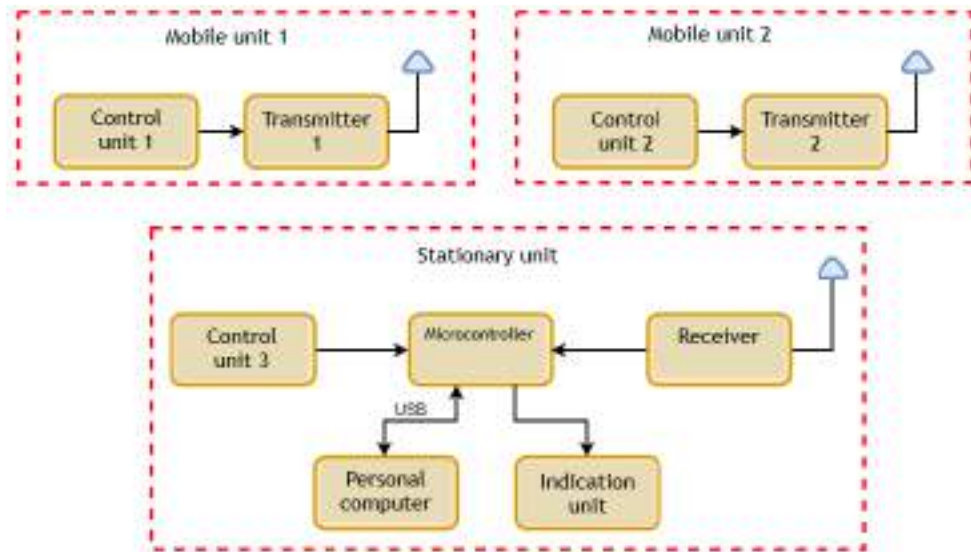
*1 – subject of control, 2 – stationary measuring unit, 3 – motion trajectories, 4 – PC, 5, 6 – the first and second mobile measuring unit, respectively*

**Fig. 2. Structural diagram of the design solution of the device for control of special speed endurance.**

The developed device consists of two mobile and one stationary measuring units (Fig. 3). Both the first and the second mobile measuring units contain a control-registering device and a transmitter. Stationary



measuring unit (2) consists of a control-registering device, microcontroller, receiver, indication unit, interface unit (personal computer).



**Fig. 3. Structural diagram of the device**

The operation of the device is determined by a stationary measuring unit that exchanges information with the mobile measuring units, and generates the results of measurements based on the signals received from them. The results are displayed on LCD display of the personal computer, which also performs their analysis in accordance with the algorithm of functioning of the internal software. In addition to prompt display of the results, the device allows storing their values in the internal memory or transferring them to the indication unit for additional analysis and visualization.

The device is developed on the basis of multifunctional microcontroller platforms.

Using the developed movement control device, a method of control of special speed endurance is proposed: on signal, the tested person touches the stationary measuring unit with his hand, begins to move along the trajectory towards the mobile unit at a distance of 5 m, touches it, returns to the stationary measuring unit, touches it with his hand and begins to move along the trajectory to the mobile unit, touches it with the hand and returns along the trajectory at a distance of 5 m to the stationary measuring unit, touches it with a hand and goes to the mobile unit along the trajectory.

These movements are made until giving up. Digital informative signals are recorded in measuring units and transmitted through the infrared line to the personal computer, where their graphic visualization is provided. According to the obtained results, the dynamics of tiredness is calculated, which gives an idea of the level of special speed endurance.

Capacitive sensor devices based on the combination of modern nanotechnology and microprocessor systems such as smartphones, tablet computers and others were used to create a means of controlling jumping height parameters. The basis of these devices are electronic measuring systems of the athlete's spatial position based on capacitive sensors [20, 24]. Among the main advantages of modern sensor devices, we can mention versatility, high conversion accuracy, thermal stabilization, ease of use, minimal power consumption with the possibility of functioning with low-voltage power supplies [20].

To control the height of the jump, a one-dimensional matrix of active band electrodes that are glued to the display wall were formed. Active electrodes will be connected to the signal converter by a signal line (electric cables harness). In addition to the electrodes, the developed device includes following: a signal line, a signal converter, an interface, a communication line and a mobile communication system, in particular a smartphone or personal computer. In the system of measurement of jumping parameters, the matrix of

electrodes forms a set of signals, by which it is possible to determine the highest and lowest point of the body of the object of control, his grouping and dynamics of movement with a time resolution of 0.01 s. Electrodes in the form of flexible conductive tapes are glued to the display wall up to 3 m high. The width of the tapes and the distance between them is 5 mm, which determines the resolution of measuring the spatial position of the object of control, in particular over the floor level.

## RESULTS

The study results of the physical preparedness of the highly qualified basketball players are given in following four tables. As it is seen (Table 1), the running time of the 6-m running in the basketball players performing central functions is  $1.30 \pm 0.041s$ , which is lower than in the forwards ( $1.36 + 0.035s$ ) and defenders ( $1.23 \pm 0.031s$ ). But it should be borne in mind that the difference is only between the indicators of the center players and defenders ( $P > 0.99$ ). This indicates that the starting speed of the defenders is better than the starting speed of the central players.

**Table 1. Results of the studies of physical preparedness of highly qualified basketball players in the 20 m race**

Indicators	Players' functions			Difference certainty
	Center players (C)	Forwards (F)	Defenders (D)	
20-metres running- 6-metres running time (s)	(n=15) $1.30 \pm 0.041$ 0.074	(n=17) $1.26 \pm 0.035$ 0.069	(n=20) $1.23 \pm 0.031$ 0.066	C-F < 0.95 C-D < 0.95 F-D < 0.99
- 20-metres running time(s)	$3.30 \pm 0.082$ 0.149	$3.13 \pm 0.049$ 0.097	$3.04 \pm 0.027$ 0.074	C-F < 0.999 C-D < 0.999 F-D < 0.99
- maximum speed at a distance (m / s)	$6.08 \pm 0.016$ 0.302	$6.38 \pm 0.021$ 0.042	$6.60 \pm 0.031$ 0.068	C-F < 0.999 C-D < 0.999 F-D < 0.99
- increase in speed from 6 to 20 m (m/s)	$1.50 \pm 0.104$ 0.190	$1.61 \pm 0.100$ 0.095	$1.70 \pm 0.124$ 0.267	C-F < 0.95 C-D < 0.98 F-D < 0.95

If one analyzes the data of the 20-meter running at 20, then it turns out that the forwards and the center players are inferior to the defenders with a high level of reliability difference between the indicators. The maximum speed at the distance in the center players is lower than that of the forwards and defenders. The increase in speed at the run from 6 to 20 cm in the center players is  $1.5 + 0.104$  m / sec, and it is  $1.7 \pm 0.124$  m/ sec in defenders. ( $P > 0.98$ ). Thus, we see that tall basketball players, especially those, who perform the functions of central players, are inferior to the defenders both in the initial acceleration and in the possibility of developing the maximum speed at the distance and in the results of 20-meter running.

However, it should be noted that in quite a number of indicators that characterize speed qualities of basketball players (35% of the total number), the difference is absent or insufficient. This suggests significant positive changes in the training system of speed qualities in highly qualified basketball players.

The results of the assessment of special speed endurance in the Run 3x40 test after 1 minute of rest are given in Table 2.

**Table 2. The assessment of special speed endurance in the Run 3x40**

Indicators	Players' functions			Difference certainty
	Center players(C)	Forwards(F)	Defenders(D)	
3x40s running after 1 min. rest: number of meters for 120 s of running	(n=12) 560.9±10.04 15.95	(n=15) 581.2±6.52 13.55	(n=21) 548.8±10.92 24.08	C-F < 0.99 C-D < 0.99 F-D < 0.95

As it can be seen from the table 2, during the test, the average indicator in the 3x40m running is 569.9 ± 10.04m in the center players, 581.2±6.52m in the forwards and 548.8±10.92m in the defenders. The difference between the indicators of the center players and the forwards is 20.3 (P> 0.99); it is 23.9 m (P> 0.99) between the center players and defenders and 3.5 m (P> 0.95) between the forwards and defenders.

There is an advantage of defenders over center and forwards. This indicates that the level of special speed endurance in tall players has significant reserves.

The results of studies of special endurance and movement techniques of basketball players are shown in the Table 3.

**Table 3. The results of studies of special endurance and movement techniques of basketball players**

Indicators	Players' functions			Difference certainty
	Center players(C)	Forwards(F)	Defenders(D)	
Movement in a protective rack 100 m, s	(n=18) 35.31±2.26* 2.7**	(n=19) 34.01±1.21* 1.58**	(n=17) 32.27±1.09* 1.18**	C-F < 0.95 C-D < 0.98 F-D < 0.98

Analysis of the study of this indicator also shows the superiority of defenders over attackers and especially over the center. The result of defenders is 32.27 ± 1.09 s, forwards - 34.01 ± 1.21 s, center - 35.31 ± 2.26 s. The reliability of the difference between the indicators, as can be seen from the table is quite high.

The results of studies of jump height in highly qualified basketball players are shown in the Table 4.

**Table 4. The jump height.**

Indicators Game functions	Height with outstretched arm standing on tiptoes	Jump height, cm	
		Absolute	Relative
Center (n=27)	279 ± 24* 6.1**	328.1 ± 3.12* 7.88**	49.5 ± 2.21* 5.59**
Forwards (n=15)	271 ± 3.49* 6.33**	324.1 ± 3.65* 6.62**	52.4 ± 2.06* 3.74**
Defenders (n=27)	256.9 ± 3.42* 5.85**	314.4 ± 3.42* 8.65**	57.7 ± 2.71* 6.86**
Reliability of difference			
C - F	p > 0.999	p > 0.95	p > 0.95
C - D	p > 0.999	p > 0.999	p > 0.999
F - D	p > 0.999	p > 0.999	p > 0.98

\*- average value and error of average value

\*\* - standard deviation from the average value

The absolute height of the jump is: in the center -  $328.1 \pm 3.12$  cm, in attackers -  $324.1 \pm 3.65$ cm, in defenders -  $314.4 \pm 3.42$ cm. The difference in these indicators is natural because players of different roles have different height. As for the relative height of the jump, the center players recorded not very high rates, as well as the attackers, which indicates a significant reserve to increase in their jump as can be seen from the table, defenders have a jump height of  $57.7 \pm 2.71$  cm, which is on average 8.2 cm more than in center players, and 5.3 cm more than in attackers ( $p > 0.999$  and  $p > 0.98$ , respectively).

When determining jumping endurance, it is best to perform jumps to a height of 90% of the maximum, until complete fatigue and refusal to continue working. When performing a series of jumps, the interval between it should be 3 sec. This time is enough for the basketball player to take a comfortable position and effectively perform the next jump – the interval of 3 sec is best set with the help of a metronome signal.

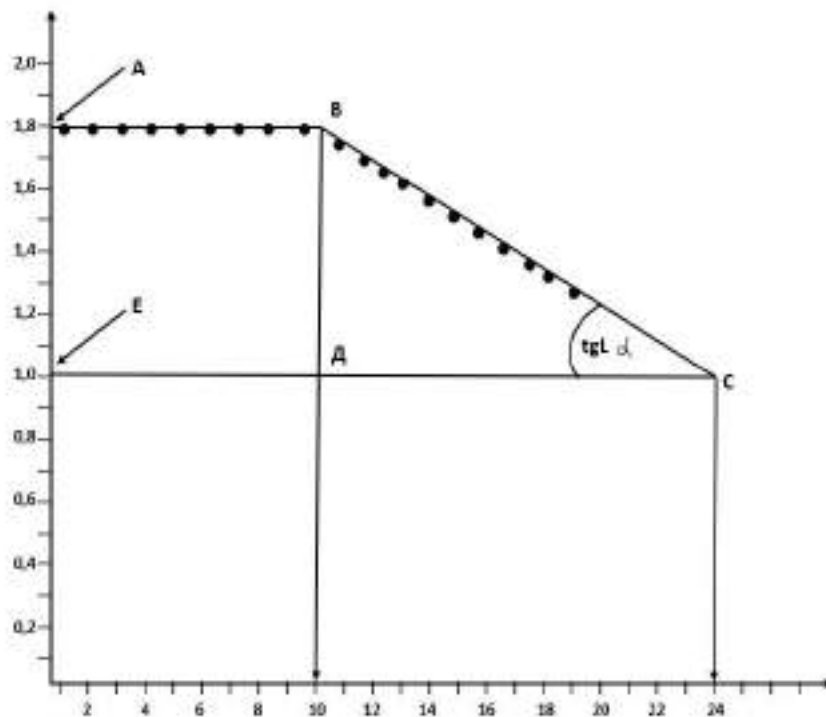
Quantitative assessment of the basketball player's jumping endurance can be obtained by ergometric analysis, which allows obtaining a number of indicators that characterize the manifestation of jumping endurance:

1. Maximum jump height.
2. Number of jumps made with maximum height.

Calculation of these indicators is based on the method of graphic analysis. Fig.1 illustrates the technique and sequence of calculation operations:

1. In logarithms, the jump height indicators of all serial jumps opposite their ordinal value are postponed.
2. At the points of the highest jumps, an average line (AB), which is parallel to the abscissa axis, is made. At the point of intersection of this line with the vertical axis, the jump height (point A) is determined.
3. At points where a decrease in jump height is clearly visible, the middleline (BC) is drawn. The rate of decrease in jump height as a result of fatigue is defined as  $\text{tg} < \alpha$ .

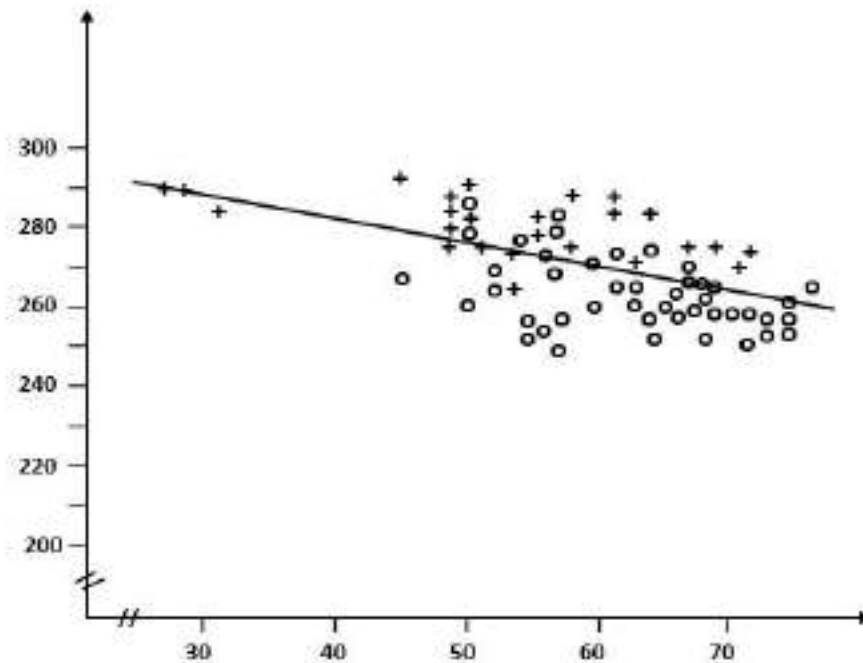
Determining these three indicators (the maximum jump height, the number of jumps with the maximum jump height and the rate of decrease in jump height because of fatigue) is very important. They characterize the level of development of various qualities of basketball players. The maximum jump height, for example, is determined mainly by the power of the alactate anaerobic process, and the jump endurance (the number of jumps with the maximum jump height) is determined by the capacity of the alactate anaerobic process. It is possible having a good "jumping", but being bad in maintaining the jump height in serial jumps and vice versa. The interdependence between these indicators is neutral ( $r = 0.573$ ). This shows that the level of development of one of these qualities does not depend on the other.



**Fig.4. Diagram for calculating jump height and jumping endurance in basketball players.**

*Source: [6].*

Our correlation analysis between height indicators and indicators in the jump height in highly qualified basketball players showed that there is a dependence between these indicators, but negative ( $r = -0.555$ ). Differences that are restrained in our studies can be explained by the different ages of basketball players and their qualifications, as well as what we determined between jump height and height with an elongated arm upwards, standing on the toes, and not just growth. The differences that are obtained in our research can be explained by the different ages of basketball players and by differences in their qualifications, as well as the fact that we determined relation between the jump height and height with an outstretched up arm, standing on tiptoes, not just height. The relation between these indicators is presented in Fig.5.



*On the ordinate axis - height, standing on tiptoes with outstretched upwards arm, cm. On the axis of the abscissa - the relative jump height, cm. Marks + - center, \*- attackers, o-defenders.*

**Fig.5. Dependence between relative jump height and height indicators with an outstretched upwards arm in highly qualified basketball players.**

*Source: [6].*

The question of the importance of determining the jump height and jumping endurance was considered by many scientists and basketball coaches [4, 25] and others.

The results of our research are consistent with a number of scientific developments [26, 27] on the feasibility of improving the system of control over the state of physical, technical, tactical and psychological training of athletes. These results of studies have shown that the use of modern nanotechnology for monitoring the jump height and jumping endurance allows you to determine these indicators with high accuracy, which is very important not only in scientific research, but also in the practical work of trainers. This makes it possible to develop training programs for basketball players, taking into account objective indicators of the state of their jump height and jumping endurance, which coincides with the results of the conclusions of a number of other researchers [28, 29].

The results of the study complement information on the control of such important qualities for basketball players as jump height and jumping endurance, and make it possible to do this with high accuracy [4, 29]. In further studies, this technique has a great perspective in the examination of basketball players of different age groups, athletes of different qualifications.

## CONCLUSIONS

1. Monitoring of special physical fitness of basketball players using modern nanotechnology and microprocessor systems to assess special speed endurance, speed-power capabilities and special endurance in the "Movement technique" test allow to effectively, with high accuracy determine these qualities.

2. Establishing criteria for determining individual functions and special physical fitness is very important in order to manage effectively the basketball players' training process.

3. The use of modern nanotechnology and microprocessor systems, namely: capacitive sensory devices, personal computers, using graphic analysis methods and mathematical statistics, allow to raise to a better level scientific research when evaluating various aspects of athletes' training using these data in the practical activities of trainers.

4. Studies have shown that the indicators of speed-power capabilities, special speed endurance, technique of movement in the protective rack and the height of jumping at defenders, forwards and center differ with a high degree of reliability, which indicates the need for an individual approach for basketball players of different game roles in the preparation of training programs.

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## **DUAL EDUCATION: PRACTICAL EXPERIENCE OF THE STATE TAX UNIVERSITY IN TRAINING A NEW GENERATION OF UKRAINIAN CIVIL SERVANTS**

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### **ABSTRACT**

*One of the promising forms of education in Ukraine, which allows to build a system of sustainable mutually beneficial cooperation between employers and higher education institutions, is dual education. The aim of the work is to assess the results of the implementation of dual education in the State Tax University and to develop proposals for improving the concept of dual education in the training of personnel for the civil service in Ukraine. The paper summarizes the theoretical aspects of dual education as a form of interaction in the system «educational institution - applicant – employer» and its practical aspects. The experience of introducing dual education in the State Tax University for applicants of the second (master's) level of education in the educational and professional programs «Fiscal Administration», «Management of customs affairs», «State Audit; Forensic Economic Expertise in Financial Investigations» is analyzed and the main problems that can be solved by the practical implementation of the concept of dual education are highlighted. The main problems faced by higher education institutions of Ukraine in the process of implementing this form of education are identified. It is established that these problems create a barrier between employers and graduates of higher education institutions in terms of employment. Proposals for further development and dissemination of dual education for the training of a new generation of civil servants have been developed.*

**Keywords:** *dual education, educational and professional program, higher education applicants, employer.*

### **INTRODUCTION**

To create proper conditions for the development of the country's innovation potential, appropriate production and technological structures are needed; availability of an information system; financial support for innovations; a sufficiently high level of education of the population and training of researchers. High-quality human capital, science and education should become the main strategic drivers of Ukraine's economy for reorientation to a high-tech path of development, formation of a knowledge society and increase of its international competitiveness. The system of training future specialists in higher education institutions of Ukraine requires improvement and implementation of new approaches to the educational process and improvement of its content and quality, taking into account modern challenges: rapid development of globalization processes, digitalization, European integration aspirations and the needs of post-war modernization of the Ukrainian economy on the basis of investment and innovation development.

Taking into account the implementation of the conceptual directions of reforming the state fiscal and customs policy of Ukraine, the staffing of the future of the State Tax and Customs Services is of paramount importance. This, in turn, requires a change in approaches to the training of higher education students at the State Tax University, since the result of reforms and the implementation of the state policy of sustainable development of the country will depend on the competencies of young specialists.

In the context of reforms and to improve the quality of training of future specialists, it is necessary to bridge the gap between the theoretical and practical components of educational activities, while modernizing traditional forms and methods of education and enabling employers to join the process of forming professional competencies of students. One of the promising forms of education in Ukraine, which allows to build

a system of sustainable mutually beneficial cooperation between employers and universities, is dual education.

## METHODS

In the course of the study, general scientific methods were used – collection of information, its analytical processing and theoretical generalization; statistical methods – to assess the dynamics of enrollment/graduation of higher education students in relevant educational programs in the dual form of education at the State Tax University; graphical – to summarize the results of the study.

The information base of the study was scientific and special literature; relevant regulations; educational and professional training programs for dual form of education at the State Tax University.

It should be noted that the development of the concept of dual education in their works paid attention to domestic scientists, in particular Andreitsiv (2017), Vemian & Ter-Ovanesian (2015), Havryliuk & Duddek (2017), Hrynevych (2017), S. Drazhnytsia & O. Drazhnytsia (2016), Kvit (2019), Postoian (2015), Svirko (2015), Farion (2013), Khomyshyn (2017), Chumachenko (2009), Shvabii (2019), Izmailov (2019) and others.

The review of literature sources has made it possible to state that a number of issues that are closely related to the creation of a single systematic concept of a rational combination of theoretical and practical components of effective training of future specialists remains in the discussion plane.

However, the need to address these issues is actualized at the stage of changing state priorities in the training of qualified specialists. These changes are a response to such current challenges for Ukraine as the massive outflow of potential applicants abroad, adverse changes in the labor market. They arise as a result of the slowdown of investment and innovation development of the country's economy, the presence of a significant number of bureaucratic issues, the application of regulations that do not fully meet the realities of today, and sometimes even contradict each other.

As a result of the theoretical research (analysis of publications of Ukrainian and foreign scholars, comments, interviews of high-ranking officials, forums), the characteristic features of the dual form of education and the problems of its implementation were summarized. The obtained results became the basis for choosing the direction of the study, defining its purpose and main objectives.

The aim of the work is to evaluate the results of the implementation of dual education in the State Tax University and to develop proposals for improving the concept of dual education in the training of personnel for the civil service in Ukraine.

Achievement of the goal involves solving the following tasks:

- generalization of theoretical aspects of dual education as a form of interaction in the system «educational institution – applicant – employer»;
- analysis of the experience of introducing dual education at the State Tax University for applicants for the second (master's) level of education in the educational and professional programs «Fiscal Administration», «Management of customs affairs», «State Audit; Forensic Expert Activity in the field of financial investigations»;
- development of proposals for further development and dissemination of dual education to train a new generation of civil servants.

## RESULTS

In accordance with the Law of Ukraine «On Higher Education» («On Higher Education», 2014), higher education institutions within their autonomy have the opportunity to use a wide range of fundamental approaches to the training of higher education students, one of which is the introduction of dual education. Currently, the legislation of Ukraine, in particular the Laws of Ukraine «On Education» dated 05.09.2017 No. 2145-VIII (as amended on 24.09.2022), «On Higher Education» dated 01.07.2014 No. 1556-VII (as amended

on 22.03.2022), «On Professional Higher Education» dated 09.08.2019 No. 2745-VIII (as amended on 16.09.2022); Order of the Cabinet of Ministers of Ukraine dated 19.09.2018 № 660-r «On approval of the Concept of training specialists in the dual form of education»; Orders of the Ministry of Education and Science of Ukraine dated 10.12.2019 №. 1531 «On Amendments to the composition of the working group on the implementation of the I and II stages of the Concept of training specialists in the dual form of education in higher and professional higher education institutions» and of 15.10. 2019 № 1296 «On the introduction of a pilot project in institutions of professional higher education and higher education institutions for the training of specialists in the dual form of education» dual education was «legalized» and thus created the appropriate conditions for the introduction of this form of education in the activities of universities and institutions of professional higher education.

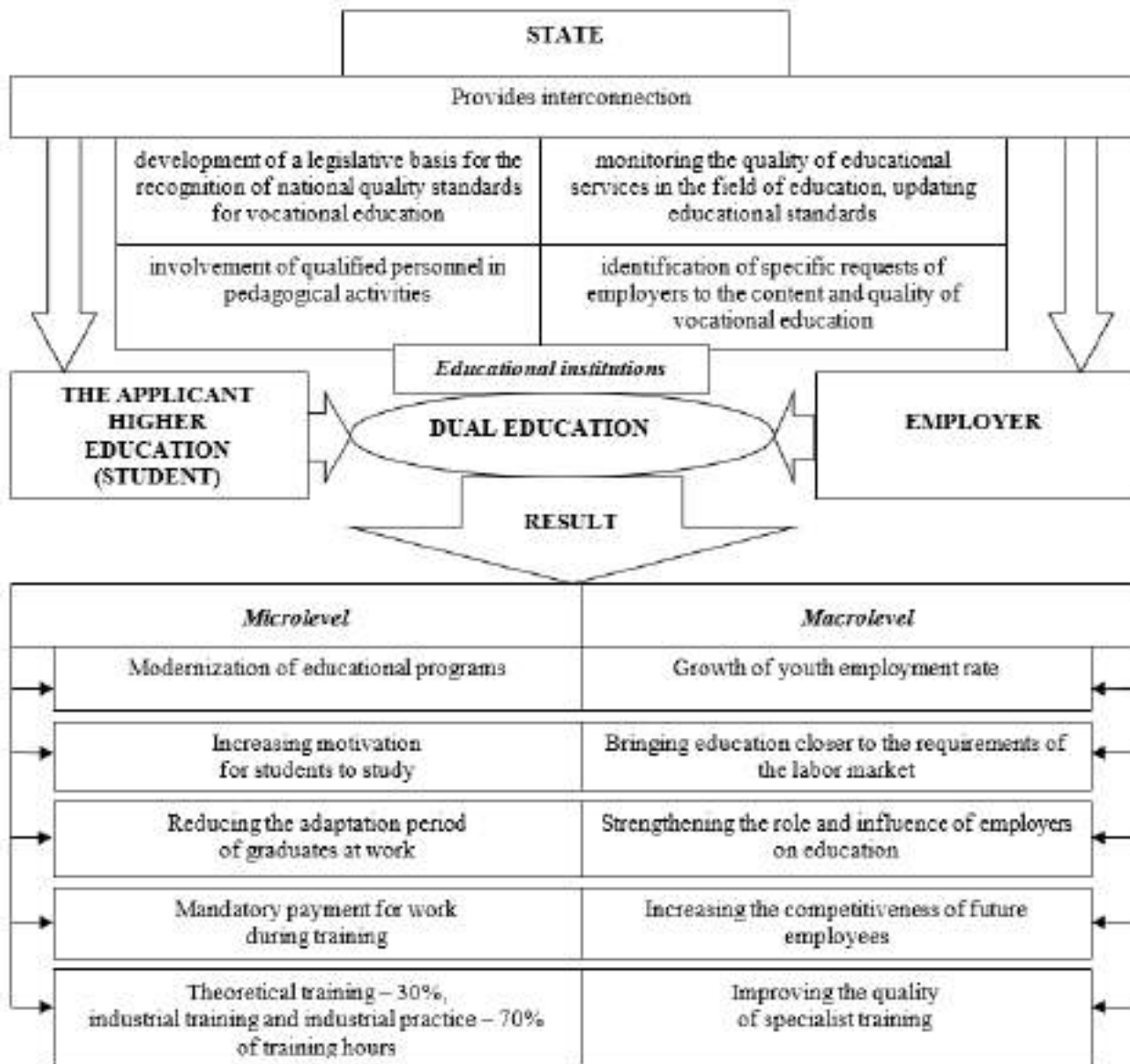
The dual form of education is based on the combination of education in educational institutions with on-the-job training (at enterprises, institutions and organizations) to obtain certain qualifications, usually on the basis of a contract. The concept of dual form of education provides for:

- modernization of educational and professional programs;
- improving the quality of training;
- bringing education closer to the requirements of the labor market;
- strengthening the role and influence of employers on education;
- increasing motivation to study;
- increasing the level of youth employment;
- reducing the period of adaptation of graduates in the workplace;
- increasing the competitiveness of employees.

This system allows to build a stable relationship between employer and student (Fig. 1).

The development of curricula for this form of education is carried out only after the potential employer has formed a complete list of competencies that a future specialist should have.

In addition, the introduction of such a form of training should be preceded by a proper analysis of the needs of the labor market - training should take place only in those specialties that will be needed in two or three years, which will eliminate the problem of excess of some specialists and shortage of others. In the autumn of 2019, the Ministry of Education and Science of Ukraine introduced a large-scale pilot project on dual education («On the introduction of a pilot project in institutions of vocational higher and higher education for the training of specialists in the dual form of education», 2019).



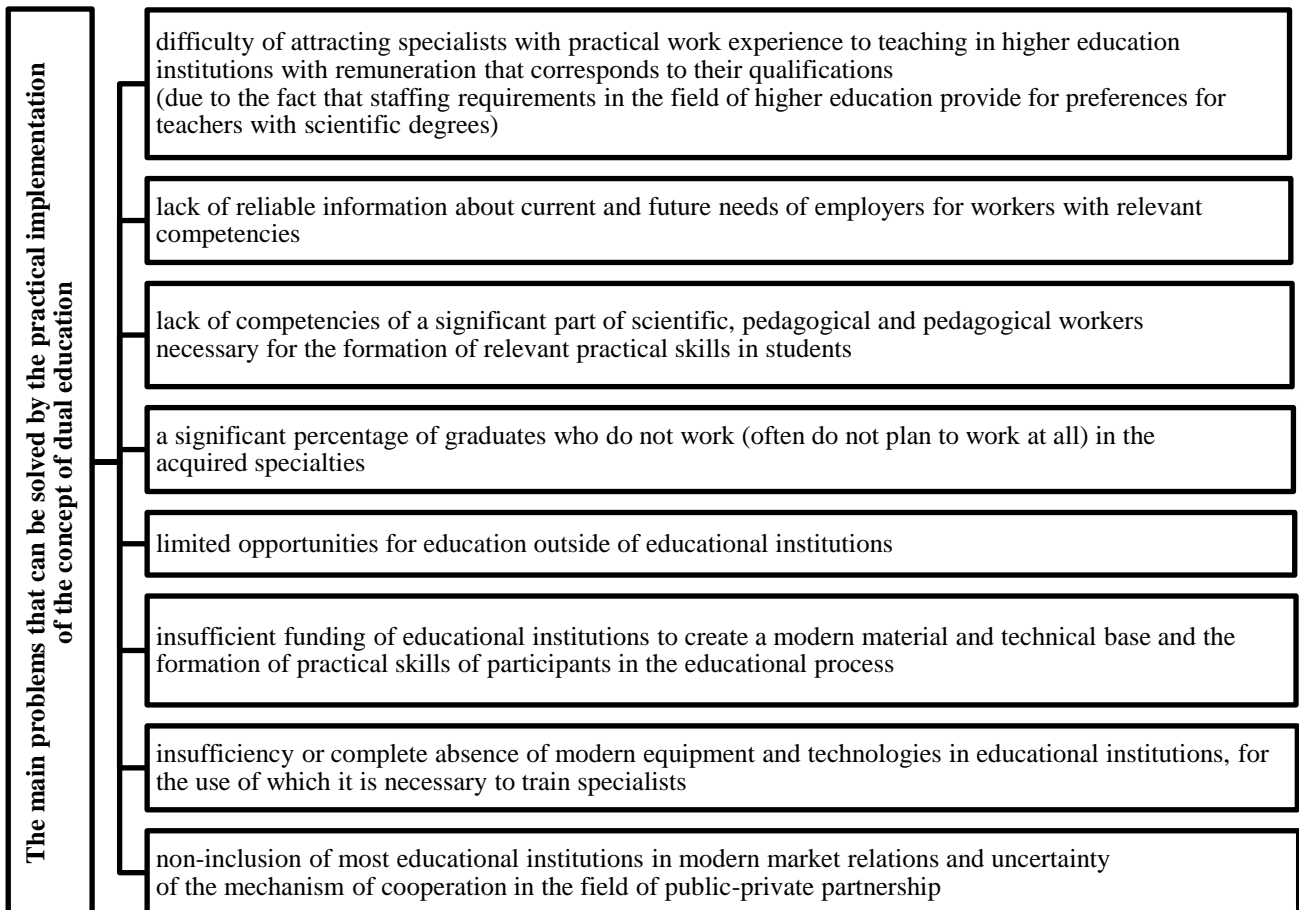
**Fig. 1. The nature and results of the relationship subjects of dual education at the micro and macro levels**

Source: Izmailov & Osmiatchenko (2019).

The purpose of the experiment is to test different models of dual education in Ukraine for four years and to develop a dual form of education that will be useful for both education and business, provide better prospects and opportunities for students. From the beginning, 44 institutions of professional higher education and higher education participated in the experiment, and as of the end of 2021 – 79 colleges and universities. About 300 employers also joined, including representatives of large, medium and small businesses (Shulikin, 2022). The implementation of the dual education concept is aimed at eliminating the main problems faced by Ukrainian higher education institutions, taking into account the realities of today (Fig. 2).

These problems create a barrier between employers and graduates in matters of employment. Employers often put forward claims to the qualifications of graduates of higher education institutions due to the lack of practical experience and a distant view of the performance of their functional duties. In the best case, graduates are assigned a probationary period for a month, two, and sometimes more. These are additional material costs, loss of time, human energy for society and economy. The dual form of education will avoid such annoying situations. The dual form of education can be chosen by students who study full-time or other

forms of education and have expressed a personal desire, as well as have been selected by employers. The student concludes a tripartite agreement with the educational institution and the employer on training in this form of education and must fulfill his obligations under the contract. Hours between theoretical and practical components are distributed differently depending on the specifics of training in the specialty (profession). There may be different models of distribution of hours and coordination of training content.



**Fig. 2. The main problems that can be solved by the practical implementation of the dual education concept**

The main one is the block model, in which hours are distributed between the educational institution and the enterprise in blocks (weeks, months), taking into account compliance with labor legislation.

One of the higher education institutions participating in the project is the State Tax University. The dual form of education at the State Tax University was introduced in three educational programs. This was preceded by the signing of memoranda between the State Tax University and the State Fiscal Service of Ukraine (now the State Tax Service of Ukraine), the German Society for International Cooperation and the Kyiv School of Economics; between the State Tax University and the State Customs Service of Ukraine; between the State Tax University and the State Audit Service of Ukraine (Table 1).

**Table 1. Subjects of the educational process in the dual form at the State Tax University**

Educational and professional program	Signed agreements
Fiscal administration	Memorandum on the implementation of dual education elements between the State Tax University, the State Fiscal Service of Ukraine (now the State Tax Service of Ukraine), the German Society for International Cooperation (GIZ) and the Kyiv School of Economics
Management of customs affairs	Memorandum on the implementation of dual education elements between the State Tax University and the State Customs Service of Ukraine
State audit; forensic economic expertise in financial investigations	Memorandum on the implementation of dual education elements between the State Tax University and the State Audit Service of Ukraine

A unique feature of the project implementation at the State Tax University is that the employers, in this case, are public service bodies, not business entities.

Table 2 shows the dynamics of enrollment / graduation of applicants for the relevant educational and professional programs.

As of 01.09.2022, 68 applicants are enrolled in the educational program «Fiscal Administration» and two graduations took place in 2021 and 2022. The program «Management of customs affairs» has 45 applicants and only one graduation took place in 2022. The educational and professional program «State Audit; Forensic Economic Expertise in Financial Investigations» is only gaining momentum – currently 17 students are enrolled and the first graduation is planned for 2023.

**Table 2. Dynamics of enrollment / graduation of applicants by relevant EPP by dual form of education**

Year recruitment	The number of applicants for higher education	Year graduation	Number of graduated masters	Number of employed persons (according to the contracts)
<b>Educational and professional program «Fiscal administration»</b>				
2019	10	2021	10	
2020	20	2022	20	17
2021	17	2023	is planned 15	-
2022	21	2024	-	-
<b>Educational and professional program «Management of customs affairs»</b>				
2020	9	2022	9	7
2021	15	2023	is planned 13	-
2022	21	2024	-	-
<b>Educational and professional program «State audit; forensic economic expertise in financial investigations»</b>				
2021	7	2023	is planned 7	-
2022	10	2024	-	-

*Training of applicants of the second (master's) level under the educational and professional program «Fiscal Administration» in the dual form of education.* The strategic goal of the program is to support the reform of the tax service in Ukraine in terms of providing professional and motivated employees who will gain the competencies necessary for a successful professional career. In essence, it is a natural experiment that allows to bring training closer to practice, as well as to collect information, analyze it and disseminate the positive experience of the pilot project to other areas of the civil service.

The teaching of disciplines is provided by highly qualified teaching staff of the State Tax University and, first of all, the graduate fundamental department of fiscal administration, which employs 5 doctors of sciences, 8 candidates of sciences.

The advantages of this educational and professional program are: training at the expense of the state budget; combination of the best international experience; the opportunity to gain theoretical knowledge from the best teachers and mentors; consolidation of theoretical knowledge in practice; employment in the reformed State Tax Service of Ukraine.

*The concept of training applicants for higher education of the second (master's) level in the educational and professional program «Management of customs affairs» in the dual form of education.* The educational program is focused on in-depth practice-oriented training of modern customs specialists and compliance with professional standards of the State Customs Service of Ukraine.

In order to strengthen the practical component of the training of applicants for this educational and professional program, agreements have been additionally concluded with the units of the State Customs Service of Ukraine, in particular with the Specialized Laboratory for Expertise and Research and the Port Community Information System.

The leading role in the training of applicants for higher education is played by the Department of Customs and Commodity Research, which employs 2 doctors of sciences, 5 candidates of sciences, 2 senior lecturers (one of whom is a postgraduate student).

The purpose of the educational program is to train highly qualified customs specialists with new views and ways of thinking, leadership qualities and readiness to solve complex problems and make effective management decisions in conditions of uncertainty regarding the protection of the customs interests of the state, able to effectively solve professional problems and meet the needs of each entrepreneur and high requirements of society for the quality of customs services; meeting the needs of the State Customs Service of Ukraine in new highly qualified personnel through motivation.

Obtaining higher education under this educational and professional program, which is carried out in a dual form, allows:

- to bring the higher education system as close as possible to the practical activities of customs authorities;
- to increase the level of interest of young people in the system of state management of foreign economic activity;
- to train highly qualified specialists who are able to work effectively in a global environment through the creation of new holistic knowledge and professional skills by acquiring and deepening competencies in the field of customs relations;
- to attract leading teachers and mentors who have practical experience in customs;
- to increase the attractiveness of work in state bodies in the system of foreign economic activity management;
- to create professional elevators for the most qualified and persistent applicants for higher education in order to realize their potential in the professional sphere;
- to eliminate existing shortcomings in the system of staffing of customs authorities;
- to strengthen the effectiveness of the «New Customs» reform.

The dual form of study under this educational and professional program has a number of advantages for all participants in the process. Thus, the employer, namely the State Customs Service of Ukraine, gets the opportunity to influence the content of the educational program in order to train customs specialists at a high level; a guarantee that graduates of the State Tax University will start their work in them, being able to select the best specialists; improving the image of the State Customs Service of Ukraine as an employer. In turn, the applicant for higher education receives the skills of a customs specialist; work and training in a group and mentoring during training; consolidation of theoretical knowledge during practical activities; practical skills in the future specialty; an open path to a future professional career; financial confidence during training and employment guarantees.

*Features of the implementation of the educational and professional program «State audit; forensic economic expertise in financial investigations» in the dual form of education.* This educational program is focused on modern scientific research in the field of economic disciplines, takes into account the specifics of the work of the State Audit Service of Ukraine, focuses on the current specialization, within which the applicant determines a professional career aimed at preparing for active creative, scientific and practical activities in the conditions of the formation of a market economy, the formation of analytical and organizational skills for effective economic activity in accordance with the trends of socio-economic development of Ukraine, the acquisition of a wide worldview.

The educational and professional program and curriculum are formed in accordance with the regulatory requirements for the organization of training in the dual form of education, taking into account the recommendations and proposals of the State Audit Service of Ukraine. The block of educational disciplines of the educational program, which is aimed at acquiring control and verification skills and tools of state financial audit, on the recommendation of the employer, was supplemented with the following disciplines: «Inspection of the budget sphere», «Inspection of state-owned enterprises», «Budget risk management», «IT-audit», «Investment analysis» and others. The program learning outcomes of the educational program are supplemented taking into account the specifics of the dual form of education.

The training of applicants under the educational program «State Audit; Forensic Economic Expertise in Financial Investigations» is carried out with the support of practitioners, which strengthens the practical component and content of academic disciplines.

The analysis of the experience of implementing dual education at the State Tax University allowed to identify the main risks:

- the difficulty of combining professional work and teaching for mentors;
- lack of a clear and transparent system of financial incentives for mentors;
- potential loss of interest of applicants in the program in case of failure to meet their expectations.

Based on the 4-year experience of the State Tax University, the leading departments have developed tips and recommendations for all participants of dual education (Table 3).

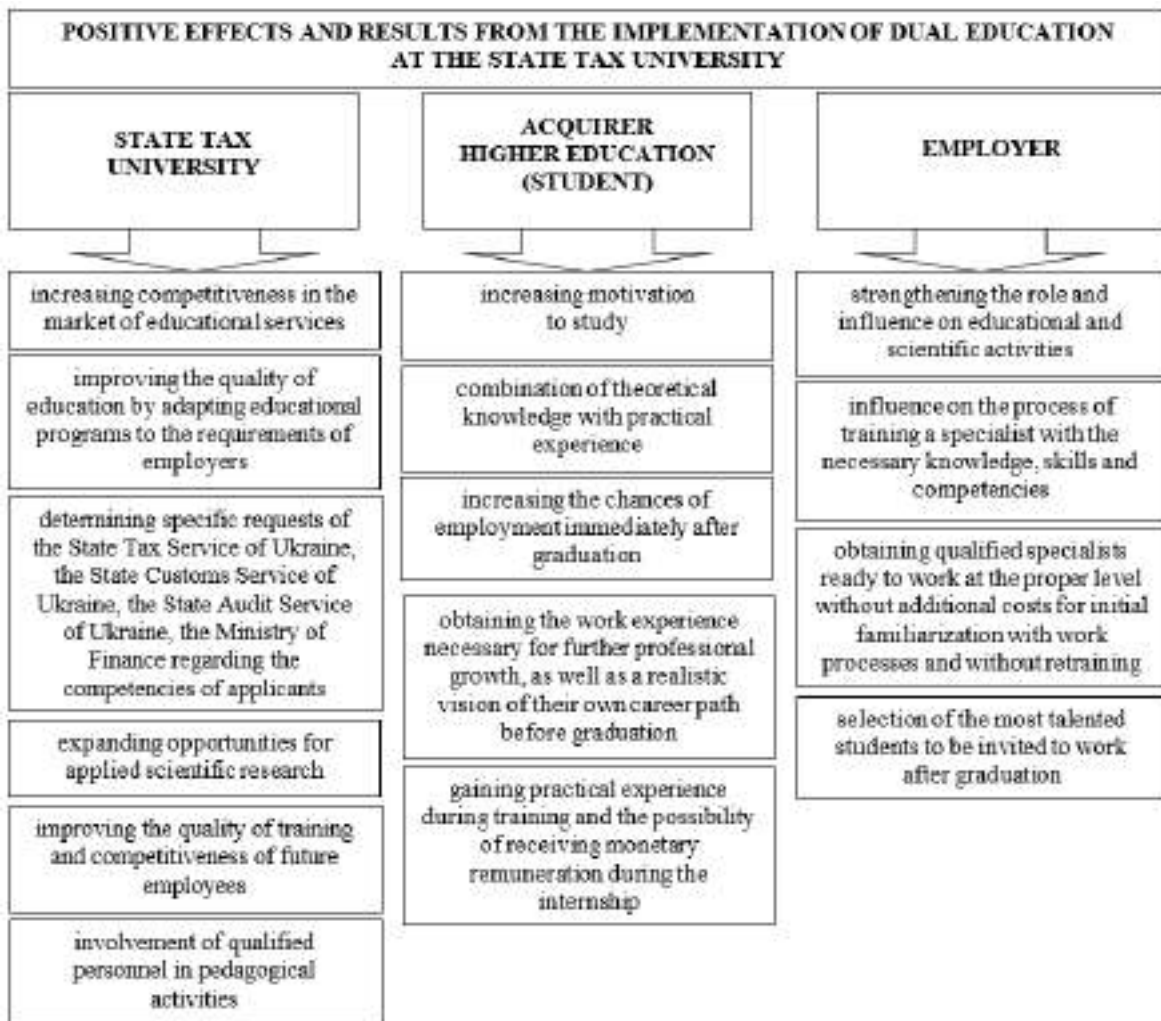
**Table 3. Recommendations to the subjects of the educational process in the dual form of education based on the experience of the State Tax University**

Subjects of the educational process	Recommendations
Mentors	explain the material with examples, in plain language; set clear tasks with specific deadlines; encourage students to show individuality and appropriate initiative; provide reasoned criticism and analyze mistakes
Applicants for higher education	perform tasks deeply, go into the essence of the issue; be active in the work; show interest and ask questions; calmly respond to criticism and comments; warn in advance about lateness



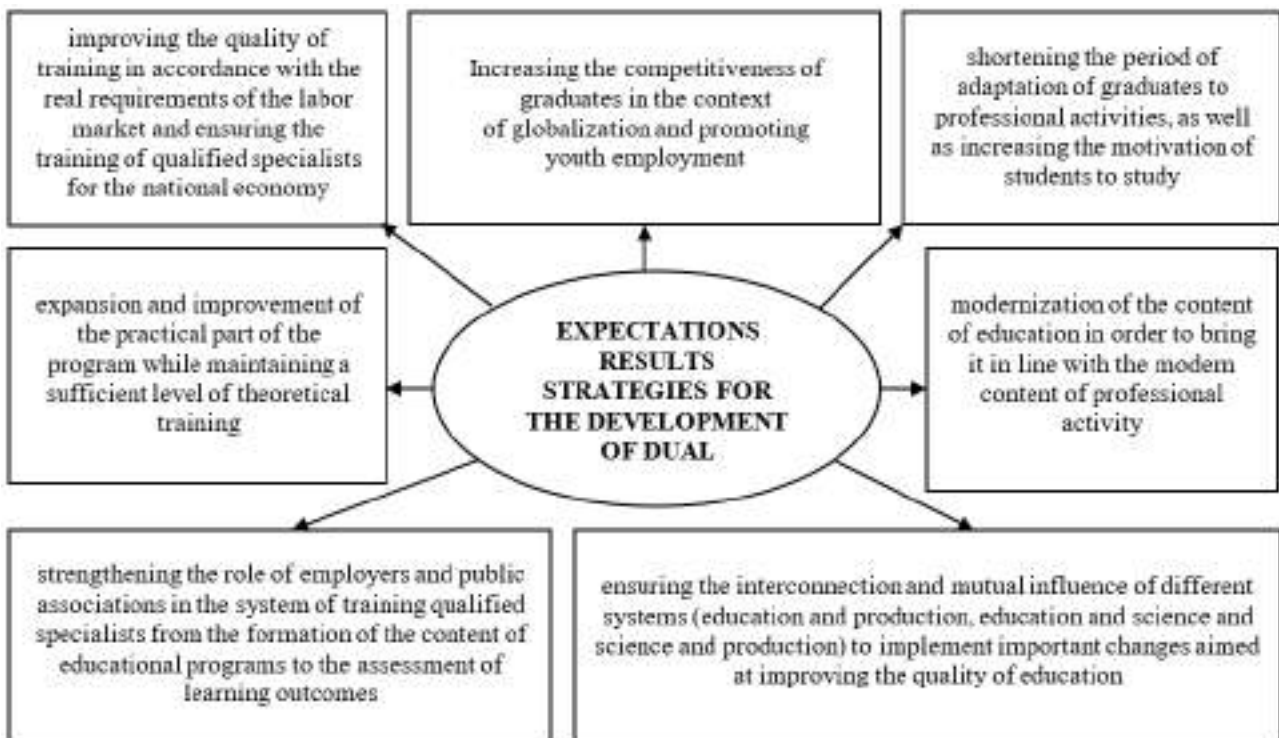
Organizers	clearly plan for the participants what will be implemented and implemented within the project; build a transparent system of financial incentives for mentors for participation in the program; organize joint meetings for project participants; create a community of mentoring program participants, where they can communicate, help and support each other; to hold coordination meetings in case of difficulties and problematic issues for their prompt resolution and development of joint actions for project implementation; to develop guidelines for mentors
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Fig. 3. shows the positive effect of the introduction of dual education for participants in the educational process.



**Fig. 3. Positive effects and results from the implementation of dual education at the State Tax University**

The analysis of the identified modern problems allows us to formulate the expected results for the national strategy for the development of dual education, which is presented in Fig. 4.



**Fig 4. Expected results of the dual education development strategy in Ukraine**

## CONCLUSIONS

The analysis of practical experience in the implementation of dual education at the State Pedagogical University allowed us to formulate the following conclusions.

1. Getting education in the dual form allows to combine learning and practice quite effectively.
2. Dual education provides an opportunity to train highly qualified specialists who are able to work effectively in a multinational environment through the acquisition of new holistic knowledge and skills by obtaining and deepening the competencies necessary for future professional activities.
3. Increasing the effectiveness of training is achieved through the involvement of leading teachers, mentors, practitioners of well-known Ukrainian and international companies in teaching (interactive lectures, trainings, etc.).
4. This form of education helps to increase the level of interest of young people in public service and the attractiveness of work in tax, customs and audit services. Підготовка здобувачів освіти за даною формою сприяє усуненню існуючих недоліків в системі кадрового забезпечення державних служб.
5. The dual form of education acts as a kind of professional elevator for the most capable and persistent applicants for higher education.

The implementation of pilot projects on dual education in the DPU allows collecting information, analyzing it and disseminating positive experience to other areas of public services. It is advisable to focus further scientific research on the development and implementation of effective mechanisms for improving the national system of training specialists in Ukrainian higher education institutions.

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## MANAGEMENT OF MODERN UKRAINIAN ORGANIZATION OF PEDAGOGICAL WORKERS' PROFESSIONAL DEVELOPMENT

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### **ABSTRACT**

*The changes which taking place in our society require the reform of the educational system including the system of pedagogical workers' professional development. The article examines the model of increasing the management efficiency of a modern organization of pedagogical workers' professional development by the implementation the SCRUM project management technology at individual stages of its operation as well as the ways of its implementation.*

**Keywords:** *SCRUM project management technology, pedagogical workers' professional development.*

### **INTRODUCTION**

Modern society is characterized by processes of changing that influence all its spheres. The whole educational system and the system of pedagogical workers' professional development as its integral part are also in the reforming process. With the change in the legislation regulating the process of improving the qualification of pedagogic workers, appeared a large number of non-government organizations that provide trainings for educators. The existing system of postgraduate pedagogical education (PPE) is based mainly on regional institutions of higher education of state or communal ownership, which have state licenses to carry out educational activities in order to improve the qualification of pedagogic workers. Being in the educational services market since the times of the Soviet Union, they have an established reputation and funding from the state.

In addition to state institutions of higher education, which implement postgraduate pedagogical education, we can see a significant number of public organizations and private companies that provide trainings for educators. Some of them, such as EdCamp Ukraine (<https://www.edcamp.ua/>) or the Academy of Digital Development (<https://www.digitalacademy.in.ua/>), have been working with educators for several years. However, new ones are appearing constantly. Such organizations' employees research the educational needs of educators actively, respond to demand by creating relevant educational courses, and conduct an aggressive marketing and advertising policy to promote themselves.

Often such organizations invite secondary school teachers and employees of vocational education and retraining institutions, who have interesting professional cases and experience in adult education, as trainers. At the same time, because of a lack of project management skills, the work of such organizations may not be efficient enough.

### **METHODS**

The methodology of the organization and management of the process of improving the qualification of Ukrainian educators is considered in the works of V. Oliynyk (2001) [1], (2012) [2], V.Gravit (2012) [2], (2015) [7], T.Sorochan (2005) [3, 4], S.Tolochko (2019) [5, 6] and others. It is worth nothing that solving the problems methods faced by the system of pedagogical workers' professional development, considered in these works, have somewhat lost their relevance, due to changes in current legislation and situation that has developed in our country because of COVID 19 pandemic and the war. On the contrary, the issue of implementing a distance form of advanced training, the use of MOOC technology for this, has become important, as it provides the opportunity to preserve the teachers' and students' lives and health, as well as to implement the educational process under conduction when part of the population of Ukraine including educators went abroad. The organizations and method of improving the qualification of teaching staff, as well as peculiarities of implementation in this process for different categories of educators are devoted the

works by S.Antoshchuk (2015) [7], (2016) [8], O.Zahar (2016) [9], (2017) [10] K.Kolos (2011) [11, 12] and others.

It is important to note that the educational process, which is implemented by modern organizations that carries out pedagogical workers' professional development, is characterized by certain features. The point is that the training courses are developed for persons, who have higher education, private life, and professional experience. In addition, pedagogical workers' professional development can be carried out in formal, non-formal, and informal ways.

Article 8 of the Law "Of Education" specifies that:

1. "A person realizes his/her rights to education throughout his/her life through formal, non-formal and informal ways. State recognizes these types of educational activity that provide appropriate educational services, and also encourages the acquisition of all types of education.

2. Formal education is an education that is obtained according to the educational programs in accordance with educational levels, knowledge fields specialties (professions) determined by law and provides for the achievement by the students of educational results determined by the educational standards of the corresponding level of education and the acquisition of qualification recognized by the state.

3. Non-formal education is one that is obtained, as a rule, through educational programs and not involves the awarding of state-recognized educational qualification at the level of education, but may finish with the awarding of profession and/or the awarding of partial educational qualification.

4. Informal education (self-education) is one that involves the self-organized acquisition of certain competencies by a person, in particular during everyday activities related to professional, social or other activities, family or leisure.

5. Learning outcomes obtained through non-formal and/or informal education are recognized in the formal educational system in accordance with the procedure determined by the legislation" (2022)[13].

L. Nikolenko (2016), notes that "in Ukraine, in the process of policy formation in the field of education, only formal education was taken into account for a long time, and practically no attention was paid to the other two categories. Lifelong education makes informal and formal ones equal participants in the learning process. The peculiarities of the organization of informal education and its flexibility make it possible to solve the most diverse educational tasks: the problems of adults' professional training, the creation of a democratic society, and the education of citizens" [14].

Understanding the need for changes in the system of improving the qualification of teaching staff, in 2019 the Cabinet of Ministers of Ukraine approved a normative document (Decree of the Cabinet of Ministers of Ukraine dated 21.09.2019 № 800-2019-p) (2019) [15], which gave educators the opportunity to legally receive non-formal and informal education, and educational institution to take into account the results of advanced training during the certification of teaching staff.

The aforementioned resolution created conditions for competition between institutions of formal, non-formal, and informal education, which contributed the improvement of the quality of the educational process, the creation of new educational courses that meet educational needs, led to the emergence of new distance courses, including MOOC-courses, where teachers can get relevant and useful information for their own professional growth.

The stormy process of reforming postgraduate pedagogical education has created a need for more effective means of managing both the educational process and the organizations that provide such education. It also caused the search for technologies that make it possible to manage these processes, which can be presented in the form of separate projects. The effectiveness of the activities of the organization that carries out professional development of education depends on the choice of project management technology and adherence to their methodology.

The main goal of the chapter is to propose a structural and functional model of management of a modern organization of professional development of pedagogical workers in order to increase its effectiveness based on the use of the SCRUM project management technology.

## RESULTS

Among all project management methods, researchers identify Waterfall and Agile as some of the most effective ones. In their opinion, “Waterfall is a project management technique that implies a consistent transition stage to another without any gaps and returns to previous stages” (2019) [16]. Whereas “Agile” is a system of ideas and principles of “flexible” project management. The key principle is development through short interaction (cycles), at the end of each of which the customer (user) receives a working code or a product” (2019) [16].

Using of Agile-project management technology makes it possible to speed up work on the project and increase its quality, which can be characterized as the conformity of the obtained product which the customer’s ideas. Using the principles of the Agile Manifesto (2001) [17], developers get an iterative approach to project management. Having concluded an agreement between the developer and the product owner and defining the technical task, the team begins development, gradually clarifying the requirements for each specific part of the final product.

One of the varieties of Agile is SCRUM. It is “a popular model used to manage projects primarily related to software development, but the principles underlying this model have been successfully applied to projects in other areas as well. SCRUM is not always suitable, as this methodology refers to flexible methodologies. The main reason why SCRUM is not always suitable for this or that project is that methodology requires a change in the understanding of project modeling of the entire team involved in the implementation of the project. Understanding of this is fundamentally different from the traditional approaches that project participants usually deal with” (2020) [18].

Educators also make attempts to use the SCRUM methodology in the management of the educational process in particular while working on educational projects. This approach was called EdSCRUM (Education SCRUM) and was founded by a Chemistry teacher from Netherlands Willy Wijnands (2017) [19].

In the proposed methodology, the teachers simultaneously act as a product owner (as he or she better understands how the final educational project developed by students should look like) and a SCRUM master (executes control and facilitation of the process). At the same time, the role of a SCRUM master can also be performed by individual students. This approach gives them the opportunity to form a leader’s qualities, responsibility for the results of their own work, teamwork skills etc. While working the implementation of educational projects students play the role of a team in the SCRUM methodology. The final product is a completed educational project.

Research shows that “the SCRUM project management technology can become an effective project management tool including at school, provided that its rules are followed” (2019) [20].

The analyses of the needs of organizations that carry out professional development of pedagogical workers, their capabilities and needs, made it possible to identify the main interconnected processes and create a management model based on the using of the SCRUM project management technology.

While researching, representatives of IT companies that work according to the SCRUM methodology and Ukrainian organizations that improve the educators’ qualification have been interviewed. As the result of the analysis of the conversations, it was determined that the SCRUM technology of project management can be implemented in the process related to the development and implementation of educational courses. The management team of the project acts simultaneously as product owners and determines the SCRUM master for each individual project from among the representatives of organization administration. Each course developed by the organization acts as a separate project. At the same time, some parts of individual project can be used in the other projects. In the case of developing a distance or MOOC course, the development team will additionally need programmers who will be able to provide the technological component of supporting. The main task of the development team is to create a standardized training course for teaching staff. Such a course should have the means to provide educators with specific content, contain tools for

performing practical and/or laboratory work, implementing feedback, communicating in pairs and groups, as well as providing the questionnaires and testing.

The development team works closely with a team of trainers who act as QA (testers), their task is to identify incorrect data and point it out to developers. Representatives of the coaching team can also be a part of the development team, as their processes are interconnected.

Educators who improve their qualification on the developed course act as consumers of the educational product and can influence the development of standardized training course by expressing their suggestions and indicating the presence of content with errors.

The life cycle of the development and implementation of a standardized training course can be represented by the following sequence of actions:

1. Determination of educational teacher's needs both in general and by separate categories;
2. Choosing a relevant topic and making a management decision to start developing of a training course;
3. Team developers and trainers selection;
4. Creation of the educational course program;
5. Development of educational materials and their design. Training of course trainers.
6. Approbation of the educational course; correction of its content;
7. Implementation of standardized training course;
8. Studying feedback and learning outcomes of trainees. Determining of standardized course's relevance. Making a management decision to continue its implementation.

Using a SCRUM methodology is the most effective at 4-6 stages of the project life cycle, which may look like this:

1. During the first meeting, the visions of the results of the training course are discussed, the scope of work, areas of activity and responsible persons are determined. The meeting is attended by a SCRUM master, who can also act as a product owner, as he or she is a part of the organization's administration, experts and developers, course trainers.

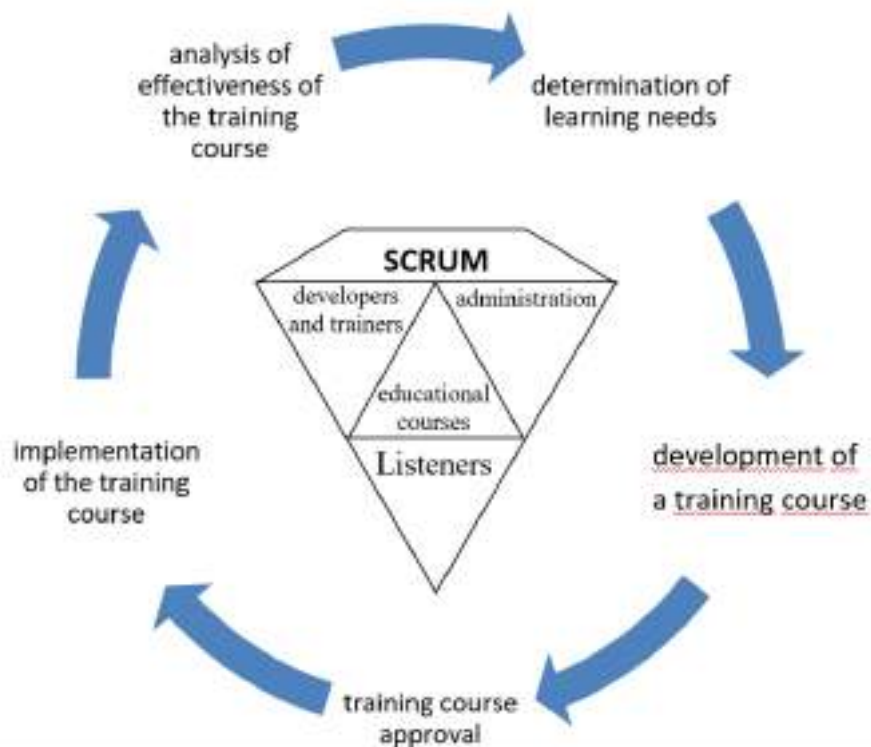
2. This is followed by an iterative development of learning materials, with daily meetings and meetings at the end of each sprint and results to reviews. The sprint length is determined by the SCRUM master together with the team according to the complexity of the planned tasks. SCRUM master, experts and developers participate in daily meetings. All of the first meeting participants take part in the review and in the retrospective meetings.

3. The next stage of work on the project is its approbation, during which trainers propose changes to the order of teaching, content etc. At this stage, the development team makes changes according to the suggested recommendations. Work at this stage can also be regulated according to the SCRUM methodology. The meetings are attended by the SCRUM master, developers and trainers of the course who do testing.

After completion of this stage, work on the development of the project (product, course) is stopped. The development team moves on to the creation of a new project if their qualifications meet the requirements of this new project. If a distance or MOOC course is developed, part of the development team members (IT specialists) provides technical support for the developed resource. The team of trainers works with educators who have registered for a standardized training course (s).

Figure 1 shows the management model of a modern organization of pedagogical workers' professional development. The central part of the model demonstrates the connections between participants in the educational process of pedagogical workers' professional development, which is implemented through the development and implementation of training courses for professional development of pedagogical workers.





**Fig.1. Structural and functional management model of a modern organization of pedagogical workers' professional development.**

It should be noted that the cyclic structure shown in Fig.1, represented only the first iteration of the activity of the organization, which carries out the professional development of pedagogical workers. After the completion of the work of each educational group according to the standardized course, its content is reserved in order to update it. If necessary, part of the content is replaced with a more relevant one, provided that the integrity of the course itself is preserved. The proposed model is not rigid and may change under the influence of social order, changes in legislation or education etc.

As a such organization can simultaneously develop and implement several training courses it is also advisable to implement the management of this process using the SCRUM project management technology.

In this case, the product to be created by the organization is its profit, and the effectiveness of the project will be evaluated in relation to the amount of funds received from the implementation of the training course to the amount of funds spent on its development. Thus, the most effective course will be the one that will be done after its development the maximum times. In this case, taking the duration of each course as the length of the “sprint”, it is extremely important to hold review and retrospective meetings at the end. During such meetings, not only the results of the listeners' work and their feedback, but also the relevance of its content should be analyzed. Developers and trainers should analyze the relevance of the knowledge to be gained by trainees and, if necessary, make changes to the content of the course. At the same time, daily meetings as conducted while the development and approval phase of the course, can be canceled if the standardized course does not need to be changed.

## CONCLUSIONS

Thus, the development structural-functional model demonstrates the interrelationships between its elements and the sequence of implementation of the stages of development and implementation of training courses for improving the pedagogical workers' qualification in the organization that carries out such activities. In order to improve the management process and increase the effectiveness of the organization's activities, it is proposed to the SCRUM methodology for project management.

Using SCRUM is envisaged both at the stage of development and implementation of training courses and in the process of managing the process of professional development based on standardized courses. The obtained results of the research it possible to specify the roles of participants in the educational process in the SCRUM methodology demonstrate the ways of their interaction and allow determine the final products as a result of the organization's activities. For the developers and trainers team, it is a training course, for the organization, it is the profit received from the implementation of training courses.

The results of the study can be used to increase the effectiveness of the activities of organizations that improve the pedagogical workers' qualification as well as for scientists who are investigating possible areas of use of the SCRUM project management methodology.

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## INTELLECTUAL RESOURCES AND INTELLECTUAL CAPITAL OF AN ENTERPRISE

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### **ABSTRACT**

*Leading global and native experience proves that modern competition is carried out through contention not by capital resources and material values, but more by the ability of effective introduction of innovations of technological, organizational and commercial nature. Forming and large-scaled development of new technologies condition global economic growth to be increasingly determined by the share of products and equipment, which is based on the progressive knowledge and modern solutions.*

*Currently, continuous assimilation of new technologies is one of the preferable lines of development for business entities of the developed counties. Norm is not one particular act of introduction of innovation, but purposeful system of activities in the form of development, introduction, assimilation, diffusion and commercialization of innovations.*

**Keywords:** *Intellectual Resources, Innovative, creation.*

Innovative activity as the process of creation and application of new knowledge. Such system of measures is called innovative activity, which is the process of creation and application of new knowledge and allowing the companies improve competitiveness and economic effectiveness. By assimilating innovations, the company generates knowledge. Its application in the field of designing, production, trading and services conditions not only development of tacit intellectual resources of organization, but also its commercialization. Manufacturing and sale of products of all types, starting with the complex industrial equipment and completed by the household appliances, increasingly depends on the material, financial, and economically important intellectual resources.

Share of knowledge capitalization in the total indicator of capitalization of modern middle high-technological enterprise amounts to 85%. Herewith, the most valuable knowledge is the one, being able to take the form of protected intellectual property - invention, industrial sample, useful model, trademark, software for computers, database etc.

Huge progress in the fields of accumulating, transferring and processing information means and technologies promoted the issue about interaction of the laws “knowledge” and “information”. Knowledge is mostly related to the people, conscious activity, receiving and processing information about the world. Materially, knowledge is the outcome of assimilation of the information by a human, group of people or organization. Availability of the information does not mean wide spreading of knowledge.

Utilization of knowledge and information, as economic resources is impacted by their material characteristics, significantly distinguishing the knowledge and information from the traditional products and manufacturing factors and relatively influencing upon their involvement in the industrial turnover<sup>1</sup>.

Common features of knowledge and information. Following may be named out of the common features of knowledge and information:

Knowledge and information do not disappear, and they may be used multiple times. The information is created one time and further it may be used multiple times;

Knowledge and information are not subject to the alienation. They may be simultaneously used by multiple consumers, without losing amount and quality;

Knowledge and information production costs are not affected by the number of potential consumers;

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<sup>1</sup> Казакова Н.В., 2002. Экономика и знание, Саратов, Саратов. гос. тех. дн.м. с. 127. 142. Мильнер. Б.З., 2003. управление знаниями. и. ИНФРА. М.: с.9 (in Russian)

Knowledge and information do not depend on the space. They may be utilized simultaneously by different subjects in different places. However, often they are valuable only for certain period of time or until occurrence of particular phenomenon, after which it might become entirely depreciated. Rates of moral depreciation of knowledge are much higher compared to other types of resources;

In view of its nature, knowledge and information are transferred irreversibly;

Abundance of knowledge and information, as wealth, does not decrease its value;

Value of knowledge and information is hardly subordinated to the preliminary evaluation. Statistic and accounting evaluation of knowledge and information is complicated, as often there is no need for economic compliance of the cost of research works and output of personnel training. Hence, complete evaluation of the cost of output of intellectual work is impossible through number of expenses;

Knowledge and information are of immaterial nature and require objective substantiation (to be submitted in writing, printed, graphical, verbal or other symbolic forms).

Distinguishing signs of knowledge and information may be allocated, making it possible to consider them as different objects of management. If the information is used for taking unified tactic decision, knowledge is the foundation for taking multiple tactic and strategic decisions. Knowledge is paralelly concentrated or collectively importantly approved information, forming micro-model of environment.

Knowledge is more deeply related to the humans and their society. It significantly depends on the intellectual and sensitive opportunities of a human. It represents thoughtful, assimilated information passing the field of cognition of a human or group of people; i.e. this is substantiated assumption and experimental output, which greatly depends on the social context (ex. dominant ideology) and hence it is subjective. The information exists in the living and non-living natures; it is more objective and dynamic than knowledge and it represents basis for knowledge.

Hierarchy “data-information-knowledge” reflects degree of understanding and depth of data processing. In order to allocate data to the knowledge, it shall be duly recognized by corresponding expertise by corresponding institutions (experts, publications etc.). Transformation of data received through measurement, knowledge undergoes natural stage of concentration and generalization, which requires stages of comprehension (revival) and institutionalized (author, title) expertise. Subjective element in knowledge perception - dependence on the experts’ group is eye-catching.

Necessary signs of knowledge. Hence, following required signs may be allocated, distinguishing it from the data:

Generalized nature;

Substantiation;

Potential usefulness;

personal nature (belief, confidence)<sup>2</sup>.

Knowledge, as economically important and valuable resource is required for the safety of corresponding economic system and it shall become the object of accounting, monitoring, accumulation, storage and periodical upgrading. Ownership right on the knowledge gains other specificity compared to the material property or value. In the triads “Ownership-Disposal-Application” ownership is weakened. Saying in simpler form, disposal may be provided because of the subjective nature of knowledge, when its application is expanded to the maximum extend.

Knowledge is valuable object of trading similar to other remaining material and non-material values.

Engagements of transferring widely distributed technologies in the innovative process, written agreements in the countries of developed market economy are comprised of tens of pages. Such engagements

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<sup>2</sup> Макаров А.А., Клейдман Г.Б., 2007. Микроэкономика знания (отд. общ. наук РАН. Цент экон. мам. ин-Е. М. ЗАО. «Экономика», с. 28) (in Russian)

are aimed at comparing knowledge accumulated by one side to the knowledge of another one, for effective utilization of intangible economical resource by its purchaser.

Striving to the knowledge economy for every country, including Georgia is favorably combined with the national peculiarities of the country. Impulsive nature of labor, characterizing local entrepreneurs, cannot provide high quality of manufactured products for long period of time. However, it allows identification of non-standard creative solutions for manufacturing knowledge-intensive products. Our country shall occupy a niche in the system of international labor distribution, which will be related to the creation and manufacturing samples of knowledge-intensive, nonstandard products. Main thing is that material direction of Georgian export shall give way to the export of similar knowledge-intensive, intellectual, and individually oriented products.

Knowledge creation, distribution and application is impossible without creation of the atmosphere based on the human, including comfortable, respected and trusted relationships. This require new types of industrial and labor relationship. If stimuli of the manufacturers of standard goods is external (sectorial) competition, for the knowledge producers it is to create professional environment by harmonic confluence of competition and cooperation.

Practical importance of distinction between knowledge and information in the first place is in the fact that the given distinctions condition differences in the management methods and schemes. Knowledge management and information management truly is not identical.

Types of knowledge as complex process. Distinction between knowledge and information may be explained as follows:

Knowledge management - deeper and more complex process, which is closely linked to the personal characteristics of human, including level of relationship and degree of development. The methods of their identification and fixing dependent on the type of knowledge, determination, distribution and application of their value, and finally - management of the listed processes. They distinguish five types of knowledge<sup>3</sup>:

1. Procedural knowledge - applied for completion of actions and responding to the question: "how to act". Usually belongs to the industrial fields of manufacturing consumer goods.

2. Declaration knowledge - related to the description and information, responding to the question: "what to do", belonging to fields of service, referring at the descriptive knowledge-situation by dependence on the state of external environment.

3. Episodic knowledge - applied in view of the similarity of situation, and similarity of the phenomenon and processes of thematics of previous episodes, stored, generalized (if required) and reused in new situations, mostly - in the field of service.

4. Euro-static knowledge - includes practical rules (introduced based on own experience) and covered methods and technologies, which are different leading enterprises from those lagging behind, allowing distinguishing specialists from the newcomers.

5. Meta-knowledge - knowledge about information searching and processing methods. Taking decisions about the time certain knowledge is needed to be used; it is characterized by the highest level of abstraction compared to the procedural, declarative and episodic knowledges.

Informal (tacit) knowledge. Given classification is comprised of another characteristic of knowledge, dividing knowledge into the explicit (open, documented, codified, formalized) and tacit (closed, non-codified, non-formalized) forms.

Informal (i.e. tacit) knowledge is personal, situation-related one and hence it is hard to be subordinated to the formalization and distribution. Formalized or codified knowledge may be transferred through formal, systematized languages. People receive knowledge through its active creation and systemizing own experien-

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<sup>3</sup> Мильнер Б.З., 2003. Управление знаниями. М.: ИНФРА. М.: с. 12 (in Russian)

ce. Hence, knowledge, which is subject to expression in words and numbers, may be said to be only the tip of the knowledge iceberg. In other words, we know more than we can express in words<sup>4</sup>.

People receive knowledge not through analyzing external objects, but along and by coexistence with the objects. Sort of “implanting” conditions, for example, formation of belief and skills. To understand, it means to create image or scheme based on unformalized and integrated details. In other words, scientific objectivity is not one of the sources of knowledge; its larger share is the product of our purposeful affords in the surrounding world. Unformalized knowledge is related to the individual types of reality and forecasting future, as well as know-how, skills and habits.

When managing innovative processes, especially at the initial critical stage, when designing new products and planning market under the conditions of high level of uncertainty, a manager is obliged to take managerial decisions not based on the objective information, which actually is too small, but by assisting of informal knowledge, related to the individual types of reality and future forecasts.

Reason for success of a company exists in the identification and transfer of informal knowledge in peculiar methods of approach. Identification and application of informal knowledge make it possible to perceive the organization not as a machine for information processing, but as living organism.

One of the main factors for improving competitiveness of modern company is the opportunity for perception and generation of knowledge. For achievement of such goal, the managers shall recognize the importance of the fact that this are known by human subconsciously and they shall understand that knowledge, not expressed in words is different from the formal understanding.

Clear example for the confidential and officially protected knowledge is outcome of scientific-technical activity. They are comprised of the outcomes of the works foreseen by the agreements for carrying out studies and processing in line with the terms of reference (officially received from the customer). This also touches upon the outcomes of initiation creative works, which is not officially involved in the terms of reference and reporting documents, but is received by the contractor. All these are comprised of the new knowledge or outcomes of the intellectual activity, which is stored on the material carrier in the form of information, and which is intangible item (Table 1).

**Table 1. Intellectual resource of an organization**

<b>Characteristic</b>	<b>Output of scientific-technical activity</b>	<b>Output of research activity</b>	<b>Experience of employees</b>
Determination	Knowledge presented in the reporting documentation as per scientific-research and experimental-designing works, based on the agreement	Knowledge transferred to the material carrier, which is not included in the agreement of scientific-research and experimental-designing works	Knowledge, which is not transferred to the material carrier, but may be used
Examples	Reports, set of construction documentation	Articles, outcomes of laboratory studies, processes and taking technical decisions	Provisional skills, creative potential
The methods of legal protection	Patents, copyright and combined rights, business and commercial secret		Agreement between employees and employers

<sup>4</sup> **Нонака Н., Такеучи Х.**, 2003. Компания - создатель знания. Зарождение и развитие инновации в японских фирмах. /Пер. с. англ. М.: ЗАО. «Олимп-бизнес». с. 18 (in Russian)

Application of intangible objects in the industrial turnover requires setting the issue about property right of the given item. The problems of receiving due legal protection are always identified in relation to the owners of the outcomes of intellectual activity. My these outcomes become subject to uncontrolled copying? Those who know its content may be dismissed from job and start working with the competitor. For legislative protection and application of creative achievements every country has adopted and function special legislative and regulatory base.

Another, currently extremely important classification shall be allocated; this is knowledge, which belongs to single individual - individual (personal) knowledge and the one, belonging to the group of people - organizational (collective, distributed), which means the ability of a company, as total unit to create new knowledge, distribute it throughout entire organization and revive it in the products, services and systems.

Specificity of generation of commercially important knowledge exists in the difference between the methods of identification of innovations in different fields of business. Four categories of the firms and sectors are allocated based on the analysis of 2000 important technological innovations<sup>5</sup>.

1. The sector of supplier demining (clothes, furniture etc.), where the firms process significant innovations under the conditions of own risks and danger or receive them from the suppliers.

2. Large-scaled/intensive sectors (food and cement manufacturing), in which the firms concentrate their affords for development of more effective technological processes.

3. Specialized suppliers (engineering, software, tools), carrying out productive innovations, often by cooperation with the consumers.

4. Knowledge-intensive manufacturers (chemical industry, biotechnology, electronics), developing new products and processes through close cooperation with the universities.

For long period of time, knowledge, as innovative process, was mostly considered as phenomenon, related to the high-technological fields and entities. They manufacture new samples and technical processing of products, technological innovations. Practice rejected such narrow method of approach and confirmed that there is no field, manufacture and company, which does not apply new knowledge when preparing products, rendering services and using management methods.

Different types of knowledge about scientific-technical knowledge and market may be presented as entrances to and exiting from the system, where innovation is transformed into the actual innovative process. External codified knowledge and external codified experience is synthesized with the internal knowledge and experience (codified and non-codified). Relatively, new codified and non-codified knowledge and experience are created, based on which productive and procedural innovations are created and competitive products are manufactured. I such case, the organization faces the problem to establish conditions, when referred transformation of knowledge is effectively carried out inside the organization.

2. Intellectual resources, as foundation to the intellectual capital of an organization. Main resource of competitiveness of an organization under the conditions of strong technological changes and dynamic competition becomes transformation of economically important and valuable knowledge of the firm into the intellectual resources, which may be capitalized.

Transformation of the intellectual resources into the intellectual capital and its, as totality of existing intellectual resources, effective management makes it possible to activate manufacturing processes, to distribute knowledge and apply it inside the firm, which is great impulse of innovative activity.

Basic distinction between physical and intellectual capital is presented in the Table 2.

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<sup>5</sup> Knowledge Management in the Learning Society. Paris. OECD. 2000. p. 22.



**Table 2. Distinctions between physical and intellectual capital**

<b>Physical capital</b>	<b>Intellectual capital</b>
Material nature	Immaterial nature
Outcome of actions in the past	Evaluation of actions in the future
Evaluation per expenses	Appraisal by value
Additive	Additive
Mostly financial evaluation	Combination of price and non-price evaluation
Periodical evaluation	Continuous evaluation
The organization holds entire capital	Organization holds part of the capital

The term ‘intellectual capital’ was first used by T. Steward. According to him, this is entire knowledge of workers of the company, which provides its competitiveness. Steward allocated three components of the intellectual capital: human, structural and consumer capitals<sup>6</sup>. Human capital is the ability of offering solution to the customers, i.e. in the first place - existence of knowledge, and on the other hand - the ability of using demand satisfaction of the clients. This determination includes distinction between intellect and intellectual capital, which is extremely important under the conditions of market economy. If the intellect is mental labor (activity), accumulated knowledge, its transformation into the capital means the ability of earning revenue through commercial application of intellect. More specifically, the ability to transfer knowledge into the intellectual resources and intellectual capital.

Structural capital - this is the forms, methods, structures, which make it possible to implement knowledge accumulation, testing, organization, filtration, storage and distribution. This conditions systemization of knowledge of employees of the firm and its more effective application, availability of staff knowledge to everybody, storage and transfer of information with proper speed, achieving synergetic effect through joint activity. Steward determines structural capital as the ability of business entity to respond to the market demand. He adds that this, as human capital exists only in the context of strategy, final purpose. Different from the human capital, knowledge, which belongs to all separate employees, structural capital belongs to the entire organization. It may be reproduced. share participation in it may be identified.

Steward includes following into the composition of structural capital: technologies, inventions, database, publications, processes etc., which may be documented and legally protected. This also includes strategy and culture of the organization, structures and systems, organizational procedures etc. All the listed and other elements of the structural capital are divided into two groups: 1) objectives on material carriers, including computer networks and software products, by which company database may be created and its effective management and socialization, which is originated from the personal relationship of people (culture, norms of relationship, mutually enriched life experience). Steward specially denotes that structural capital may take different form in relation to the certain company. Main task of management of structural capital is to transform knowledge of the staff into the ownership of the company and to maintain it as such.

Consumer capital - this is relationship of the organization towards consumers of its products, which is significant integral part of the intellectual capital, as in such relationship intellectual capital is transferred into the money, earning actual revenue. Evaluation of these relationship is relatively easier compared to the human and structural capital, for which following indicators are used: clients’ satisfaction, which may be easily related to the dynamics of financial indicators of the company; yield earned from the cooperation between the client and manufacturer (evaluated for two parties). Client’s devotion price (expenses incurred for gaining new clients and maintaining old ones).

<sup>6</sup> Стюарт Т.А., 2007. Интеллектуальный капитал-новый источник богатства организации. М. (in Russian)

In course of analyzing intellectual capital, Steward indicates at the importance of existence of optimal balance between all of its elements, as hypertrophic development of separate elements may give rise not to the growth, but reducing of manufacturing.

E. Brooking considers classification of intellectual capital in more details and allocates four integral parts in it: market resource, intellectual property, human and intellectual resources<sup>7</sup> (see the Table 11.3).

Intellectual capital may be determined as everything valuable to the firm and existing in the people working here or conditioned from the industrial processes, system or organizational culture. Intellectual capital includes all the knowledges and abilities, explicit and tacit ones, which belong to both - organization and separate entities, as well as structural and cultural elements.

Term “intellectual asset” is the types of intellectual resources, determined, described and registered by the organization.

The model of intellectual capital for creation of value of the organization at the same time shall manage following types of intellectual capital:

Human capital - ability of individuals and teams to satisfy clients’ demands per competitiveness and directions of opinions of individuals.

Customer capital - strength of links with the clients, value offered to the client, growth fo client’s impact for taking decision

Organizational capital - in view of the codified knowledge, ability of the organization placed in the different markets of knowledge, business process, technological infrastructure or organization culture, values and norms.

**Table 3. Integral parts of intellectual capital**

<b>Intellectual capital</b>			
<b>Market resources</b>	<b>Human resources</b>	<b>Intellectual property, as resources</b>	<b>Infrastructural resources</b>
Service mark Commodity mark Corporate mark Purchasers Purchasing devotion Repeated engagements Corporate name Order portfolio Distribution mechanisms Business cooperation Franchise agreements Licensed agreements Favorable agreements	Education Professional qualification professional potential Personal style work-related knowledge Work related skill	Patent Copyright Software Right on design Industrial extorts Know-how Trade mark Service marks	Corporate memory Corporate culture Management processes Information technologies Cellular links Relationships with financial circles Demanded standards

Intellectual capital is the relationship between human capital, customer capital and organizational capital, maximizing the potential of creation of value by the organization.

The concept “intellectual capital” and its composing elements is not comprised of some novelty or business activity for earlier unknown elements. Group of intellectually unified resources is principally new, which mobilize them in the form of economic development factor and identify such factor, as intellectual capital of the organization.

<sup>7</sup> Брукинг Э., 2001. Интеллектуальный капитал. СПб: Питер (in Russian)

The concept of intellectual capital was developed as the instrument of improving profitability and value of the company. Hence, knowledge, idea, intellectual resources, which are much more valuable in terms of economic and non scientific-technical or sociology are much more valuable. Such pragmatic approach of the founders of intellectual capital absolutely complies to the main generalization basic values of market economy and entire capital: according to the economic theory, capital, in wider sense, is the property, which is able to earn income. Respectively, intellectual capital is the totality of intangible wealth, used by the organization for the purpose of earning income.

According to K. Marx, “Capital is not the sum of the material and produced means of production. Capital is not a thing, but rather a definite social production relation, belonging to a definite historical formation of society, which is manifested in a thing and lends this thing a specific social character”.<sup>8</sup>

Intellectual capital is not formed of separate elements: human, structural and consumer compounds, but originated by their interaction, i.e. inside the organization people establish certain relationships with each other based on the existing formal and informal structural norms and rules. Hence, it is quite general to prove that intellectual capital is not only the totality of intellectual resources of the organization, but as the system of relationship between business entities, for the purpose of producing, distributing and application of intellectual resources and knowledge required for their effective functioning.

The essence of intellectual capital, as economic category may be determined as the system of economic relationship formed between business entities at the level of individual reproduction of capital for the purpose of exchanging, distribution and consumption of manufacturing intellectual products. Intellectual capital is more complex subsystem of common economic system of capital reproduction. We speak not only about existence of certain type of resource, but the nature and degree of interaction inside and outside the company, making it possible to use the resources more effectively.

3. Strategy of management of intellectual capital under the modern conditions. Under the modern conditions several main types of management strategy of intellectual capital is used, allowing its formation and application for improvement of competitiveness of a company. They are directed towards creation of realized values in the products, human and process, through rational formation and application of knowledge in the organization.

In the works dedicated to the intellectual capital management seven combinations of existing strategies are allocated<sup>9</sup>. Three of them exist in the effective formation and application of knowledge in one of the types of intellectual capital (human, structural and consumption); other three strategies mean achievement of positive effect from interaction between two different types of intellectual capital. And finally, the seventh strategy is built in view of simultaneous interaction of all three elements of intellectual capital. Hence, basic strategies are directed towards knowledge exchange within the framework of one type of the intellectual capital for its increasing, or effective transferring of knowledge from one type of intellectual capital to another.

Characteristics of the types of the strategies of management of intellectual capital. If the referred basic strategies are considered more deeply, the first strategy is based on the knowledge creation and application within the framework of human capital. It responds to the question: how the knowledge is exchanged between workers of the organization: how their competence is improved and how it is used for increasing competition of the organization. This strategy is directed towards development of individual competences of workers through their learning, carrying out trainings, and forming corresponding corporate culture.

The second strategy foresees knowledge production and application within the framework of structural capital. It responds to the question, how the knowledge exchange is used between separate elements of structural capital for improvement of competitiveness of a company. Inter-corporate information systems may be created and developed using such strategy, as well as filling them with the data about technological

<sup>8</sup> К. Маркс/Капитал/Маркс. Энгельс Ф. соч. 2-ое изд. с. 380-381 (in Russian)

<sup>9</sup> Ганонецко А.Н., 2002. управление знаниями. М.: ИПК. с. 132-156 (in Russian)

and marketing opportunities, and about existence of leading experience of certain function. Formation of organizational structure providing intensive exchange of knowledge inside the company is one of the directions of implementation of the second strategy. Management of intellectual property and assets of the company also takes place within the framework of the second strategy.

The third strategy is based on the creation and application of consumption capital directed towards application of knowledge exchange between its elements. It includes links with the clients, suppliers, competitors, local unions and trademarks and image of the organization. Objective of the strategy is building effective external links of the organization, growing its competitiveness and promoting implementation of its preferences. It is based on the marketing technologies, directed towards development of relationships with the suppliers, workers, shareholders and local unions.

The fourth strategy is intended for the knowledge calculation between human and consumption capital, improving competences of consumers, suppliers, and other counteragents by the employees, and improvement of competences of the staff by the external counteragents. In other words, it is intended for and directed towards creation of joint knowledge between organization and external partners; it is comprised of the methods of interaction with the consumers, increasing individual knowledge of the staff of the company. This may be implemented through different ways, in the first place, through direct contact with the consumers and marketing and sociology studies.

The fifth strategy is based on the knowledge exchange between human and structural capitals, oriented towards the impact of individual competence of workers towards formation of internal structure of the organization and relatively improvement of individual competences with the help of the elements of structural capital. The given strategy basically means transferring individual knowledge towards inter-corporate system and improvement of its wide application by other employees.

For example, knowledge base applicable in the organization may be brought, which includes data about each order, surnames of the project participants, reactions and evaluations of the clients, and offered solutions. This allows us to speak individual and collective knowledge about transformation. Relatively, it will become possible to carry out effective training of new employees directly on the work places, without their removal from performance of direct obligations. Herewith, the company becomes less dependent on certain working expert, with huge experience and knowledge.

In all given example, vague knowledge inside the organization is transferred into the clear and explicit knowledge, i.e. receives documents, procedures and other forms. Hence, human capital is transformed into the structural capital, knowledge flow is directed from individual competence to the internal structure, which is further precipitating in the information system.

The sixth strategy is characterized by the knowledge exchange between structural and consumer capitals. It is directed towards organization of knowledge flows from outside to the internal structures of the enterprise and on the contrary, from internal structures to the external ones. The given strategy mostly deals with the transfer of basic knowledge to from the field of interaction to the external counteragents of the organization through inter-corporate systems and their fixture there, for wide application by the employees. Database about the clients is material element of internal structure of the company. Its one of the most important resource is the set of data about sales, promoting rationalization of production process, reducing optimization of expenses and reserves. Through concentration of the data about its customers and organization of individual services, multiple companies provide material priorities towards competitors. Sometimes knowledge inflow from the consumers is made in one of the subdivisions of the firm, including departments of the scientific-research and experimental-designing works.

External environment of the organization is not made of only clients. This also includes competitors. Hence, within the area of the sixth strategy the actions take place, which are directed towards transfer of knowledge from competitors to all internal structures of the organization, joint actions, for example through carrying out scientific-research and experimental-designing works.

The seventh strategy is the one based on the simultaneous knowledge movement simultaneously between all types of intellectual capital. Some companies allocate special place to the human capital, training, education, motivation and promotion systems. Others pay attention to the promotion of goods in the market, and the issues of gaining corresponding share of market. The third ones are engaged in the creation of the corporate system of management oriented towards application of modern information technologies. Only few of them give simultaneous due attention to all aspects of knowledge management. One of the expressions of carrying out the seventh strategy completely by the firm, is regular monitoring of intellectual capital.

The most important elements of management of intellectual capital is its evaluation, when it is relatively difficult as the most of the intellectual resources are not included in the composition of accounting assets of an enterprise nor represent the object of financial reporting. Earlier, exceeding market value of the company to its carrying amount would be explained by several subjective factors, including speculative ones, exceeding market price to the carrying amount is related to the existence of intellectual resources, which cannot be fully reflected in the balance, but represented in the reporting carrying amount in the form of intellectual capital.

Analysis of the reasons, forcing the company to carry out studies in the field of intellectual capital show that all are focused on the provision of future development. In view of the intellectual capital, the circumstances are identified, which make grounds to the future growth of the company. Analyzing dynamics of the indicators during several years allows explanation of the factors of organization development, improving of its management, determining direction of concentration of affords. Employees measuring effectiveness aspects of their activities perceive demand set by the company better and concentrate own forces through feedbacks. Hence, foreseeing intellectual capital conditions its further development.

4. Peculiarities of management of the staff creating intellectual resources. External and internal conditions of creation of intellectual resources. Above-mentioned concept “intellectual capital”, which is not only the totality of intellectual resources of the organization, but the system of economic relationships, reflecting the nature and degree of internal and external interaction of the organization through exchanging, distributing and consumption process of intellectual product. Herewith, it determines organization of interaction between those, who establish intellectual resources and those, who can use them effectively.

In the first place, we shall specify the conditions, when such interaction takes place. In fact, these are the conditions of innovative activity in the company. Implementation of intellectual opportunities of a human conditions for creation of new, unknown knowledge, used in the market and the company uses it for taking intellectual rent and corporate preferences. Of course, condition for receiving such outcomes shall be comprised of two circumstances:

1. Existence of competitive environment in the field of organization activity;
2. Certain level of scientific-technical development in the field the company operates in.

If there are no such conditions, it is impossible to provide staff motivation for creating novelty, knowledge demanded in the market or if there is not market. More specifically, there is neither demand nor supply of new technological, organizational, or commercial solutions, i.e. the problem of development of innovative activity is not actual for the company. External circumstances and conditions may and must be foreseen, but they cannot be changed, nor always selected.

It is important to the manager to respond to other question - how to create conditions inside the firm, making it possible to unite specialized scientific, technological and commercial knowledge of separate workers into the knowledge of the company about object of activity. Such knowledge does not only increase knowledge potential of separate worker but provides higher effectiveness of activities of the company.

Specialized scientific, technological and commercial knowledge of separate people inside the organization are united into the unified system of the required organizational information for solution of the tasks faced by the company. The most important peculiarity of knowledge creating modern worker, compared to the workers of the last era is that today he is not the only scientist; nor unique creator or new

idea generator, but participant of unified corporate business - producing knowledge. Here the necessity for organizational and technological provision of the workers of such category becomes evident, as well as the necessity for processing adequate systems of communication and availability of information sources, etc.

Collective creation of new knowledge foresees active exchange of individual knowledge between team members. Certain methods and mechanisms of its formation may be different in line with the existing structures and methods of management.

Main types of development of individual knowledge and skills. They consider two main types of individual knowledge and skills of team members:

1. Team members perform autonomous tasks. Each of them carries out accurately determined function, team knowledge may be determined as the cumulative knowledge of all participants. Solving problems in such teams is achieved through their quantitative growth, attracting new specialists in separate fields. Such method of approach towards creation of intellectual resources characterizes hierarchy bureaucratic structures, where accurate distribution of functions dominates between workers and subdivisions and the number of staff workers is increased along with the solving of the problems.

2. Knowledge of one participant of the team is not used within the framework of its functional obligations, but it is taken into account when taking solutions related with the development and formation of strategic goals, analyzing internal and external environment, expansion of functional obligations etc. Increasing intellectual resources of the given group takes place by adding new flows of knowledge about separate elements of the task to be solved, and unifying different knowledge about object of the activity, in the form of unified systemic representation.

Of course second type of interaction shows higher effectiveness of innovative production, but its creation and supporting requires permanent generation of individual knowledge of the personnel, its accumulation, development and transfer. This requires observance of the following terms:

1. Existence of effective communications between members of the working group of the organization;
2. Continuous and permanent training of staff, as per entire organization, and separate teams and subdivisions.

Main factors affecting the motivation. Such internal conditions are implemented through introduction of the corporate information systems, management of intellectual resources, and formation of progressive organization structure, oriented towards intensive exchange of knowledge inside the organization. This makes it possible to transfer knowledge into the document, procedures database etc. Knowledge flow is directed from personal knowledge to the internal structure and further precipitating in the information system. Individual knowledge is transferred into the organizational knowledge.

However, in the first place, conditions shall be established, when creation of individual knowledge is motivated. Based on analyzing specificity of activity of the workers creating intellectual resources main factors may be determined, which have impact on their motivation to create individual knowledge for the company<sup>10</sup>:

1. The workers shall accurately present the nature of industrial assignment, which shall be performed by them and not certain outcomes to be achieved;
2. Responsibility for productiveness and economic performance is significantly transferred to their workers - each of them shall manage oneself when creating new outputs. Comparative relationship is required to them;
3. continuous innovative activity shall become integral part to the industrial knowledge of the worker. It shall respond to the creation of invention and participation in its application;
4. Activities of such workers necessarily foresee, on the one hand, continuous self-education and self-improvement, and on the other hand - teaching others;

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<sup>10</sup> Мухнева С.Т., 2003. интеллектуализация экономики: инновационное производство и человеческий капитал//Инновации. №1. с. 49-511 (in Russian)

5. Productiveness of the employees is not measured by quantitative or content. Quality and usefulness of outcomes of the organization are of primary importance;

6. Improvement of productiveness of workers creating intellectual resources requires their perceiving not in terms of “expenses”, but as “capital” and accordingly to establish relationship with them. Employee motivation system shall be built on their desire - to work in the given organization and working in the organization shall be priority to them, in terms of all possible options.

All these requirements, including the latter (6th) one, is almost entirely opposite to the requirements set for improvement of productiveness of work of the employees doing physical work.

Organizational knowledge is formed in course of activities during training process, in order to accumulate knowledge in the form of habits. Organization training is not considered to be formal educational process, but as accumulation, assimilation and application of knowledge and experience, in the very field of activities of the enterprise. Organizational training is considered to be the continuous source of creating competitive preferences of the company, as the strategy of continuous upgrading of the methods and improvement of effectiveness of activities of all types. Organizations, not performing continuous training principle and relatively are not changed, are weirded under the conditions of rapid changes of external environment.

Main provisions of organizational training. Basic provisions of organizational training include the following<sup>11</sup>:

1. complex and non-foreseeable nature of external environment of the organization makes it necessary to upgrade knowledge required for effective management at continuous basis. It prevents strict planning and control of activity. Development of the strategy in the first place shall take the form of training;

2. The most often collective training takes place, but conciliatory to the adaptation and development, in the first place shall be the manager himself/herself;

3. Training is of developing nature through conduct, which promotes retrospective thinking and is directed to the understanding of implemented actions. Strategic initiatives are carried out by those with the ability and resources for training. Experience is formed from the successful initiatives, which may be transferred into the scheme, i.e. developed into the strategy;

4. Role of the management exists in preliminary detailed planning of the strategy of conduct of the company, and further support accurately and strictly its implementation. Strategic training may give rise to the formation of new strategies;

5. Training in the organization shall not only develop ability of the organization to the change, but set up entire internal mechanism to the innovations, and generation of new ideas and solution. Organization intending to respond to the changes, shall use the information and knowledge effectively and create them. Employees of the company shall not meet innovations passively but be their active introducer.

Training-oriented organizations are able to improve their skills and habits at individual and collective levels (to think together and interact productively).

Expenses on the training of personnel in the leading organizations of the world today represent solid amounts. For example, expenses of US private sector on improvement of qualification and trainings of employees is continuously increased. The companies Xerox and IBM spend approximately 2 thousand US Dollars per one employee for this purpose. Total amount spent on the training of the personnel amounts to 1.5% of the total turnover. Amount spent on training of separate specialists is much more. For example, the amount spend on training of trade representative in IBM is approximately 200 thousand US Dollars<sup>12</sup>.

However, education always goes behind the practice. Inertia nature of assimilation of new knowledge conditions mandatory stage of its recognition, changes in the content of new training, and teacher trainings.

<sup>11</sup> Мильнер Б.З., 2001. Теория организации. М. ИНФРА - М.: с. 421 (in Russian)

<sup>12</sup> Интеллектуальный капитал-стратегический потенциал организации М.: «Социальное отношение». 2003. с. 39 (in Russian)

Innovation of modern situation exists in the fact that there is suspension in one generation between formed culture of significant fields of living and the rate of in-depth upgrading of knowledge.

5. The model of creation of organizational knowledge - Nonaka and Takeuchi. In view of the fact that innovative activity became basis of industrial life, intellectual resources of the organization, as assimilation and development of management mechanism of the a whole are required.

it shall be noted during introduction of internal organizational training system that productiveness and training quality of each employee is impacted by the reserve of both - explicit and codified knowledges. Codifying and, in terms of cognition - complex accumulated experience are sometimes of primary importance.

AI. Nonaka and Kh. Takeuchi offered training, as the concept of improving level of own knowledge, of both - explicit (published in books and manuals) and tacit (based on subjective perception, and hardly transferred or not transferred in words). As knowledge is established not by entire company, but by separate individual, in course of their business activity, hence, creation of organizational knowledge foresees development of created knowledge with organizational methods and its application in the form of the system of organizational knowledge. This process is carried out within the framework of “combining interactions”, which goes beyond internal and inter-organizational bounds<sup>13</sup>.

Nonaka and Takeuchi’s dynamic model of knowledge creation is based on the idea about knowledge creation and distribution, through social interaction of formal and informal knowledge. They called such interaction “knowledge transformation”. This process is not considered as unilateral (from explicit to tacit knowledge), but bilateral ad spiral-like developed process. Innovation is created through interaction of formal and informal knowledge (the authors give example of mini bakery, introduction of new system of management of work time of the oven and staff in the Company Matsushita).

Nonaka and Takeuchi’s knowledge transformation types. As instructed by Nonaka and Takeuchi, identification and commissioning of new knowledge by a company takes place through implementation of four processes of knowledge transformation; they are:

1. Socialization - knowledge distribution and creation of informal knowledge; for example, creation of intellectual models and technical skills. This process describes how people exchange tacit knowledge, sometimes even without help of a language. For example, through experiments, training sessions etc. Consequently so-called friendly knowledge is created, along with the common intellectual models and technical skills.

2. Externalization - transforming tacit knowledge into the explicit one, often through special language methods (analysis, metaphor) This process is usually formed while creation of conceptual models; initiated by collective service. Consequently new concepts of products or technologies are formed.

3. Combination - formation and transfer of the information submitted in certain form from one person to another, inclusion of new concept into the system of collective knowledge. And finally, creation of systemic knowledge, i.e. creation of prototypes and new technologies, as the combination of new concepts and existing knowledge.

4. Internalization - transformation of explicit knowledge into the tacit form: people assimilate the knowledge, learn in action and use all sense organs in course of learning. Internalization creates operative knowledge about project management, industrial process, application of new products and implementation through political line. Such model shows interaction between formalized and non-formalized knowledge, which is necessary for the purpose of formation of entire system of organizational knowledge, which gives full image of actual processes. In course of management of the innovation processes, the essence of knowledge transformation model may be represented briefly as follows:

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<sup>13</sup> **Нонаки И., Такеучи Х.**, 2003. Компания \_ создатель знания. Зарождение и развитие инновации в японских фирмах. Пер. с англ. М.: ЗАО «Олимп-бизнес». с. 111 (in Russian)



1. Innovation is identified in the form of tacit individual knowledge from creation of an idea about new product. Further it is socialized, the knowledge is distributed, and so-called “friendly knowledge” created, the team of processors of common intellectual models and technical innovations is established.

2. At the externalization stage tacit is transformed into the explicit through collective discussions, often using special language skills. This forms new concept of products and technologies represented in the form of technical documentation for creating trial sample.

3. At the combination stage, new concepts are involved in the system of collective knowledge. As a result, systemic knowledge is created in the form of prototypes of new products and new technologies, as the outcome of new concepts and existing knowledge. It is represented in the form of designing and technological documentation for production of trial batch of new products.

4. At the last - internalization stage, explicit knowledge again transforms into the tacit one. People assimilate it, learn action, create operative knowledge about promotion of new industrial process, and application of manufacturing new products in the market, and management of new system etc.

For creation of organizational knowledge, informal knowledge created and accumulated at the level of individuals shall be socialized by other workers of the organization, i.e. new cycle of knowledge creation is created at the higher level. This is how the cognitive spiral is created, presented in the Figure 1 and by which above four processes dynamically interact. Distribution of the spiral between all stages of production, when moving to the new level, expands knowledge base used in the different fields of activities of the enterprise.

	<b>To tacit knowledge</b>	<b>To explicit knowledge</b>
<b>From tacit (default) knowledge</b>	Socialization (friendly knowledge)	Externalization (conceptual knowledge)
<b>From explicit knowledge</b>	Internalization (operative knowledge)	Combination (systemic knowledge)

**Fig. 1. Cognition spiral**

Herewith, permanent development, expansion and upgrading of knowledge of an organization take place. In the given case, the essence of the strategy exists in the ability of the organization to acquire, accumulate and apply its knowledge. Knowledge is formed by the individuals themselves. The role of the organization exists in the mitigation of training, supporting and stimulation of individual knowledge, its registration and synthesizing at the group level, sharing dialogue and experience.

6. Peculiarities of motivation of the staff creating intellectual resources. Price of the work force in the modern society is increasingly determined as per its intellectual component. This is dictated by the necessity for changing corresponding directions of organization-managerial grounds of business. Complete realization of intellectual opportunities of an individual, different from the physical opportunities, requires qualitatively different affords. In the first place, it exists in allowing a person provide full realization of his/her creative potential. Both - high material motivation and (and sometimes more) social and psychological climate of labor activities is important here.

observation.

Permanent demand for creation of new products and obtaining priorities of new technologies increases demand for experienced, qualified and creative workers. Such workers may create industrial values at the expense of activation of real, creative origins, which exceeds resources invested in them in multiple times. Application of information technologies for improvement of labor effectiveness strengthens degree of mobility of creators of intellectual resources and makes it possible to freely move in the labor market.

Under such circumstances the company faces the problem of attracting and maintaining qualified personnel. Herewith, it shall be foreseen that growth of intellectualization of economy changes motives of

maximization of material wealth of preferences of person and sodium, understanding self-realization opportunities through holding and application skills of knowledge. Material demands are maintained and developed not as the term for saving a person, but as necessary term for its spiritual development, as confirmation and sign of social status, source of satisfaction by life and professional activity.

This means that the value of certain organization for the workers depends on how the company appraises bit of the worker in its business activity. How simply and easier the firm can predispose an employee for its communication, knowledge exchange and expanding its value in the labor market. Hence, management of human resources is closely related to the innovative management - management field, formed by the global changes in the science and technics. Innovations and creativity – these are the forms of identification of self-realization of a person. However, it also be foreseen that because of orientation towards knowledge-intensive economy of a company, management of people becomes more complicated. As people determine themselves their conduct. Provision of creative self-expression of an employee is not enough. It is necessary to take action for pushing towards actions through different methods. This requires atmosphere of constructive cooperation, where each staff member is concerned of full realization of own abilities. Hence, significant aspects of management of human resources under the conditions of permanent innovations is motivation and qualification;

This forms new demands for the workers, and in the first place, for the workers of intellectual labor, who may be formulated as follows:

1. Creative skills of a person goes to the first place, along with his/her professionalism and erudition, and ability and opportunities for self-development and self-perfection.
2. Innovative nature of production requires application of new models of management of human resources, in view of the expansion of functions of an employee, who is able to carry out surveys, evaluate, analyze and synthesize information, and make required corrections.
3. Practice has proven that the most effective method is achieved by thoughtful activation from the worker's side, both at performance and creative origins, which is flexible forms of labor management, foreseeing expansion of rights of ordinary workers in the production management. This especially touches upon the persons, who are engaged in the intellectual and creative works.

The employee, in fact, holds special capital, placing the holder next to the capitals of other types (material, financial), representing him/her as one of the holders of the enterprise and authorizing him/her to participate in the management. The workers, who are not official managers, are increasingly requested to have the skills, which have been the prerogative of managers and organizers of production earlier. Distribution of authorities between key and lower levels of management, granting freedom to it in course of activities requires formation of the sense of responsibility, the ability to work in the creative team and organize work of such group, focus at the lines of own activities and have understanding about entire work of the organization, foresee own place and role in the company.

For more and more specialists, especially entrepreneurs, labor gained individual creative forms, free, uncontrolled self-expression and not the means for earning money, creating value, the method and means for earning money. A person expects implementation of personal potential from profession and he/she strives for and tries to develop own opportunities.

Under the modern conditions, at the company level, this is identified in the development of different forms of social partnership: in particular, this is participation of the personnel in the earning of profit, ownership and management. One of the forms of such strategy is the practice of allocation of autonomic design groups, which will be completely responsible for the entire cycle of processing and implementation of new product. This latter gives rise to the strong moral and material stimuli among staff for improvement of innovative activity.

In the large corporations, for the persons engaged in the creative labor, this means creation of such conditions, as small those characterizing small innovative business. This is granting full independence to the organizations of works, separation of the groups participating in the project when entering the market. This

also means transferring ownership rights on certain resources, creation of conditions for high compensation of work. In the event of success, this also means using own resources by the employees in the business activities, full independence from the formal organization-bureaucratic procedures for the predetermined time.

Herewith, we can assume that transferring to the intellectual economy is characterized by the cardinal changes towards requirements set to the HR management.

Basic changes of the role of the personnel. is implementation of the listed and their similar managerial methods of approach, which is practically impossible within the framework of traditional hierarchy structures of management. This is why one of the most significant trends of the modern managerial revolution is rapid growth of variety of different organizational forms. This will make it possible to use creative self-realization opportunities of employees in full, along with the internal and external cooperations of the business entities. This conditions flexibility of internal management system and organizational structures of modern companies (Table 4).

**Table 4. Evolution of personnel role in the era of information economy**

<b>Industrial economy</b>	<b>Information economy</b>
Technologies are more important resources than a human	People and technologies - per importance of equally valuable resources
People perform only one part of the tasks	People satisfy customers' requirements in full
People continuously repeat same things	People perform different works
Professional training of staff means studying creative features	Professional training of the personnel foresees training of the skills of different types, including interpersonal relationship, administrative, technical skills, when attention is transferred to the development of human features.
Organization promotes some training, for leaving narrow circle of positional obligations.	Promotes people to understand better all aspects of activities of more companies
Business obligations are scheduled in the way, not requiring thinking	Performance of work requires huge intellectual efforts from the staff
People work isolated and perform same works	People work in teams, where they often are to transfer from one work to another
Managers give assignments, establish schedules for their performance, provide training, control labor effectiveness and take decisions per labor organization of subordinates	The workers set and perform the task themselves, conclude schedule of their performance, control the methods, take decisions in relation to the issues of organization of own work
Consider the information as the source of power and privilege	The information is considered as valuable resource, belonging to the entire organization
Ordinary workers are provided with the minimum information about their state in the organization	Every worker is provided with the maximum of the information about state of the organization

Special attention shall be paid to the dynamics of organizational structures in the knowledge-intensive companies and organizations, for which performance of scientific-research and experimental-designing works is main type of activity. Their example makes evolution of structures and approaches visible, in relation to the management of innovative processes and its components.

7. Leadership development when managing qualified personnel. Being founded on the participation in the decision making process, distribution of responsibility and information, trust, consideration and loyalty, staff management system requires formation of the manager and leader of new type, different from the requirements set earlier to the managing administrator and economic leader.

Managing leader usually performs main role in taking and implementing decision. Here, great attention is paid to the personal characters, making it possible to perform certain assignments by people. When successful operation of the firm requires strict control and planning, managing administrator is required, who has good understanding of carrying out successful activities and control created situation.

Manager of innovative type is different from the managers of previous type by trying to change the dynamics of development of the firm, searching for the new directions of activity and opportunities for expansion of nomenclature of the products manufactured by the firm. He/she does not provoke past in the future, through analyzing typical solutions and selecting one of the existing options, but, on the contrary, forming new, more complex objectives, generating risks and new decisions.

New functional features of the manager of innovative type. Managers of innovative type shall align the type of economic growth of organization, its high creative activity, changing relationship to the formation of self-expression of a person, risk, initiative, through searching and industrial conduct oriented towards assimilation of technologies of new production, communications, and growth of sales, and development of innovative organization forms of an enterprise.

In the modern organization, representing public system, managers shall be involved in the process of taking decision under the complex environment of subjective processes, who expresses common aspiration for maintenance of functional system. Under the chaotic condition, instead of the iron hand for establishing order from the outside, companions shall gather, in order to develop agreed action promoting achievement of common purpose.

Manager of innovative type - is not the manager in its traditional sense, but the person equal to the partners. Herewith, it plays the role of catalyst in course of common business, managing searching for goals, involve those into motion, who identify themselves for this purpose and gather the partners for solving created problems. For provision of continuous adaptation of innovative development-focused organization, manager shall perform leader's functions (the manager shall be the leader).

When accurate assurance for the necessity of administrative methods of impact was replaced by management with the concept of management of balanced system of resources of the company, which foresaw the nature of resource of all types, the term 'leadership' became popular, as special feature, the model of conduct of a person or company, providing leading positions. During changes in pattern, which pushes business to the copying, can already provide competitiveness. Uniqueness is being searched. Leadership, as management system, shall stimulate innovative conduct of the staff, providing creation and application of new knowledge on each level of activities of the company.

Features of management system. Minimum two features of new management system may be allocated:

1. Provision of innovative conduct of employees of the company and 2. reproduction of leaders at each level of organization.

When such interpretation, understanding of role of a leader in the organization requires reviewing. Provision of innovative conduct of all workers of the company, i.e. their cognitive, compulsory continuous training, generation of new ideas and their implementation even under the conditions of modern systems is too complex. Herewith, the objective of transferring maximum amount of employees into the leaders stands out, i.e. into the worker, who tries to develop ownself and develop own company. Leadership sets extremely serious demands to the person. However, the main problem is - this is an unusual image preventing the opinion about strong leader in the society.

As practice shows, the largest difficulty of transformation of activities of the company does not exist in the development of correct concept, nor in reorganization of basic business-processes and the key management, main objective of in the quality is changing features and conduct of hundreds of workers, while

solving this objective mostly depends on the ability of lower and middle level managers and their mood towards underwent reforms.

Ordinary managers try to maintain order and control, provide performance of set goals under the conditions of allocated budget and existing resources. Leader-managers, on the contrary, are focused on the searching for new ways of development and try to attract as much employees as possible when solving significant task. To their mind, main metrics for success is growth of effectiveness of the company in general. Transformation leaders are distinguished in several peculiarities, main ones of which are<sup>14</sup>:

The ability - to establish system-producing links between three factors conditioning success of transformation: market realities, key management aspiration and opportunities of staff of the company;

The ability - to have impact both - on the managing and subordinated staff, as well as the colleagues being in equal condition in view of their position, to provoke strong stimuli, and participate in the reforms.

The talent of using new tools providing practical introduction of intended changes, based on the continuous reviewing of methods of approach.

The ability - to change style of leadership.

Main principles of leader-managers. Leader-managers coordinate strategic ideas and thinking of key management, phenomenon in the market, developments and reaction of ordinary employees of the company. They continuously search for the new data about different aspects of market situation, and often do this personally, not by limiting accounts of the employees. The most of the leader-managers of new type support and understand following principles:

1. Strict standards of effectiveness. This does not only touches upon financial indicators of the company, but consumption values of the goods and services offered to the customers and the system of staff promotion;

2. Inclusion of ordinary employees in the transformation. It shall be built in the way promoting releasing of covered creative forces of each person and filling them based on the final outcomes of management. Leader-managers know that delegated authorities operate materially only in case when the employees are requested to perform set tasks unconditionally.

3. Self-management and joint responsibility of each team member (both - leaders and ordinary employees). In order to regulate conflicts and earning maximum benefit in relation to the persons with different opinions, the leaders use open dialogue.

Most of the leader-managers - this is middle level management. Company demand may be allocated for the leaders of three accurately identified types, they are: line- public leader in places; leader - general manager, internal network leader - i.e. team establisher.

Importance of line leaders for innovative activity in situ are explain by the fact that they act in the epicenter of creating value, where goods and services are created and relations are established with the customers. It is line managers to form the processes, by which new ideas are formed or they are not preventing established practice. However, their role is not limited by the introduction of strategy of line management. They make critically important sources of innovative ideas.

Leaders - general managers, make unique bit (have unique importance) by both - creators and instructors. In the role of creators they may play their role in relation to the leading ideas - profiling business-values, long-termed objectives, management systems at the highest organizational level etc. Like instructors, they assist line leaders in maintaining optimal ratio between tactic and strategic goals and improving leadership features of other workers.

Main elements of concentration of top managers. Attention of top management shall be concentrated on the critical elements<sup>15</sup>:

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<sup>14</sup> **Концбах Д.** Истинные лидеры преобразования//Вестник Мckinsey - <http://www.vestnikmckinset.ru> (in Russian)

<sup>15</sup> Менеджмент XXI века под. ред. **С. Чоухдари**, 2002. Пер. с. англ. М. ИНФРА. с.237 (in Russian)

1. Importance of common competitive task. Key managers shall promote each employees to understand the essence of the lines and method of approach of forming future. In the era of such changes, the firms manage all the tasks without understanding; this is the same as to sail in the open sea without compass.

2. The hierarchy of the accurately formulated values and models of conduct and their introduction. The system of values - this is the material linking the organization. It promotes team working and provides transfer of knowledge. Compliance of individual values and understanding of the culture of the company is an important indicator, making it possible to forecast staff flow and, relatively, success of activities of the company.

3. The ability of impact in case of absence of ownership right on the item. This means the following: The managers shall remember that “they compete as “family firm”. The impact may come from the performance of only one objective, trust and other information infrastructure. It is interaction, and not management of transactions that are of critical importance.

4. Competition for the talents and creation of the set of organizational abilities is the problem of vital importance for maintenance of competitive priorities. Training, distribution of authorities, team working, focus on effective activity, opportunity for registration and transparency - these are important parameters of high-effectiveness of future of the organization.

5. Speed of response of the organization required for making decision on the lower level. This means that the staff understands exactly common direction of work of the company and its role in the common structure, he/she is competent to make accurate choice. Hierarchy shall give way to the speed (operativeness) and authority - to the competence.

6. Mobilization of corporate resources. It means permanent combination of resources and repeated combination of newly originated opportunities. For responding, strict administrative limits are established, and charters become ineffective.

#### Internal network leaders

And finally, last type of leaders - internal network leaders. They are formed from the executive managers of lower or middle level. They are distinguished by mobility and the opportunity for free shifting within formal network bounds. It is this type of leaders to perform the function of establishing links between different subdivisions of innovators and organization. As confirmed by the practice, most of the innovations are distributed through informal networks. Local network leaders are of resolute importance for distribution of innovative practice. Without their effective activities, only local signs are established in the company - these are innovation “pockets”, which are unable to perform changes in the entire company.

In the first place, attention shall be paid to the issues, which have not be set before and they are set to the agenda, it would appear on the final positions of the listing of the problems. They are:

How to increase attractiveness of the company both - in view of the investors and own staff.

Is it necessary to provide strategic planning making it possible to maintain and activate strategically focused staff of the company.

How to reduce high-qualified staff flow under the conditions of strict competition.

How to change motivation degree of young specialists.

How to increase opportunities of the employer, new realities related to the motivation of the young and high-qualified staff.

How to evaluate effectiveness and return on the capital invested in the personnel.

How to compensate loss of “genius heads”, reduce dependence on them, maintain heritage and high quality of taking decisions after “outflow of stars”.

And finally, how to increase the value of intangible assets, in particular of intellectual capital.

People and competition make decisive factor in the competitive fight. This is especially visible in the practice of application of information technologies. Top management pays special attention to it, investing huge resources both in the assimilation of new technologies and training of staff, and this is main strategic objective of the organization. Different situation is maintained in the most frequent cases of basic personnel.

HR Director, as a rule, is not in the composition of management of the Company (strategic planning level). Hence, manager of the company is often remote from the staff-related processes. And HR Director is remote from the company strategy. Herewith, it shall be foreseen that strategic objectives of the company are achieved by the staff. This is what the top-managers of companies say about it:

HR role from the side of different managers is not understood to be development focused strategic function;

Objective of HR system is presented by the top-management in subjective, incomplete and indifferent way;

In fact, there is no comprehensive HR policy, entirely supporting strategy of the company;

In working with the staff, special accents are transferred to the accounting functions, formal procedures of planning and control instead of the development functions;

Planing and forecasting demand for the staff is mostly carried out formally, while modern business requires predetermination.

When speaking about managing leaders and innovative conduct of employees, we shall mention that conduct of qualified workers often prevents the principles of building multiple modern companies. In the uniquely distinguished fields, the leaders are demanded, who stimulate management systems and the staff learning with the innovative tools.

8. Intellectual property in the composition of intellectual resources. Characterizing example of codified, explicit knowledge, which is included in the intellectual resources of a company, is protective output of the scientific-technical activity. They are protected as the objects of intellectual property. If the firm has registered special rights on such outcomes, no other person can apply them even, if he/she has this knowledge created independently.

Protective codified knowledge, as a rule, is created when planning new goods or services, the method of their producing, finances of the organization and innovations in other fields. Of course, even in case of simple improvement of such activity and its outputs, they are directed towards provision of economic effectiveness of the company.

New knowledge related to the actual effectiveness of the organization is always the output of the innovative activity.

Of course, there are several authors of commercial knowledge and none of them is able to manufacture commodity products and make success in the market independently. By joint action and achievement of success, they are lawfully integrated with the rights corresponding to the size and price of their bit. Right on the fee may be assigned only in case of obtaining right on the created commercial knowledge.

The problem of receiving due legal protection of the outcomes of creative work is always actual. Any idea is easily compiled without corresponding notification to their owners and authors. Legislative protection and application of intellectual property is accepted in every country and special regularity applies.

Outcomes of intellectual activity and the means, goods, works and services of individualization of the legal entities equated with them and the enterprises, who are provided with the legal protection (intellectual property) are:

1. Products of science, literature and art;
2. Software for computers;
3. Databases;
4. Outputs;
5. Phonograms;
6. Online or cable, radio or TV notifications (services of air and cable broadcasting organizations);
7. Inventions;
8. Useful models;
9. Industrial samples;
10. Selective achievements;

11. Integrated chip topologies;
12. Production secrets (know-hows);
13. Firm names;
14. Trademarks and service marks;
15. Name of the place of origin of a product;
16. Commercial designations.

Intellectual ownership right is recognized on the outcomes of intellectual activity and equated individualization means, which is comprised of the special rights like property and other rights: right of inheritance, access right etc. Intellectual right does not depend on the right of ownership of tangible asset, which is comprised of the outcome of the intellectual activity, or individualization means.

The mechanism of forming portfolio of intellectual resources of a company. Analysis of activities of large and middle companies shows that, when trying to protect their scientific-technological potential, companies form solid portfolio of intellectual resources, providing regular support to them and fill them. Size of the portfolio depends on the strategy for protection of intellectual property and they count from 500 up to 5000 patents. This promotes prevention of possible conflicts through signing cross-license agreement, if, for example, competitor declares about violation of the own patent right.

Companies pay huge attention to the formation of portfolio of intellectual resources and its compliance to the main strategy of the company. Offensive nature of management strategy of innovative processes is the matter of attention in the companies. Of course, central range of management in the field of innovations is the stimulation of the technological forecasting and predetermination of changes.

Size of the portfolio, in particular, number of the received patents, is dictated by the marketing and advertisement objectives and it gives positive evaluation of the technological potential of the company from the side of the society. The patents are important as confirmation of the achievement of the global technical level. In the global practice, this is the criteria for evaluation of effective operation of managers and the symbol of achievement of competitive priority and technical priority of the firm. Such priority is significant trump in course of tenders declared for the orders and one of most significant positive elements during evaluation of creditworthiness.

When forming portfolio, it is important to correctly select the issue directly related to the planned business out of the accumulated knowledge and information and the one to be allocated to the number of required intellectual resources. Selection of the object and legal protection method is determined by the strategy of transforming intellectual resources in the assets of the enterprise into the enterprise assets. Herewith, they are guided with the following main strategies and their combinations:

The strategy of protection from the competitors through obtaining monopoly rights on the new products during its transferring to the market. Its implementation requires evaluation of the preferences allowing selection of the optimal methods of registration of special rights and making competitive patent activity self-aware about the territories.

Attack strategy. Receiving special monopoly rights on the studies and processing, allowing everybody use similar, but unprotected outcomes of intellectual activity, acquire permission from the defenders of their rights for their application. Holding the right for application of production technology may be monitored in the market determined by the legislation and supported by the competitors. Strategy of licensing is the part of marketing strategy of a company. Along with the finished products, technologies may be placed in the market, including while reproduction. For example, according to the franchising schemes or when selling technological equipment.

The strategy of forming charter capital The strategy of forming charter capital in the form of contribution to the property of the company may include the right of intellectual property (expressed in cash form). Special right may be assigned to the expensive equipment (property), contribution of which may earn high (decent) income to the holder in the form of dividends.



The strategy of creating modern image of a company is being developed through management of intellectual resources. Investment attractiveness of an enterprise is increased at the expense of their capitalization. The system of inclusion of employees into the business development through practical application of outcomes of their intellectual work forms corporate culture. Formation of financial flows from the subsidiaries into the parent company through license agreement is considered to be the effective lever of corporate management.

The strategy for optimization of financial-economic activities is determined by the opportunities of several reporting transactions related to the intangible assets, using following methods:

Reduction of income tax through reducing tax base, which is subject to taxation, in the amount of the expenses incurred on the creation of the depreciation provisions and the objects of intellectual property.

Economy of transferring from the remunerations, when compensating labor of the workers in the form of copyright fees, foreseen when signing agreement about transfer of right of application of the objects of intellectual property. This touches upon intellectual property created with own initiative and not - by business assignment.

When taking decision about legal protection of the outcomes of intellectual activity, we shall always foresee basic principle - relationship of the costs of obtaining legal protection right to the costs of its provision. There always is the alternative. Outcomes of intellectual activity may be used without registration of its ownership right. Especially when dealing with the innovations originated by force.

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