WayScience

International Electronic Scientific and Practical Journal

Volume 6 (№1)
2023

ISSN 2664-4819

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Editorial board of International Electronic Scientific and Practical Journal «WayScience» (ISSN 2664-4819)

International Electronic Scientific and Practical Journal «WayScience», Vol. 6 (№ 1). Ukraine, Dnipro : FOP Marenichenko V.V., 2023, 169 p.

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Ukraine (Dnipro) – 2023

Economic sciences

SOME ISSUES OF THE DEVELOPMENT OF THE NON-OIL SECTOR IN MODERN CONDITIONS

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Abstract. *The process of globalization expanded rapidly from the end of the 20th century to the beginning of the 21st century, and it can be said that it has achieved its faster pace of development against the background of the formation of economic dependence and close economic interaction between countries. The process of globalization also creates unique new challenges and destructive tendencies. As a rule, the main economic advantages of the globalization process are obtained by developed countries, or rather, by producers and inventors of industrial products, including capital and science-intensive products on the world market. The dominance of raw materials in the structure of production and export of developing countries essentially determines the dependence of developing countries on economically developed countries. The point is that developing countries are exporting more raw materials, including oil and gas resources, to the world market. The export of oil and gas resources also causes unique shocks and crises in the world market, and in most cases, these crises are relatively distant from economic processes and play the role of military and political threats. Taking into account all this, developed countries are trying to achieve ecological balance under the name of green energy transition, as well as getting rid of the economic dependence of oil exporting countries as their biggest goal. In recent years, especially in the countries that have joined the*

European Union, including Germany, and in addition, in Japan, trends such as reduction of oil and gas consumption have been observed in the structure of energy consumption. In general, the countries of the European Union prefer green energy, including the use of renewable energy sources, in order to reduce dependence on oil. Therefore, this trend brings unique changes to the development of the Republic of Azerbaijan, one of the oil exporting countries in the post-oil era.

Keywords: *Republic of Azerbaijan, green energy, non-oil sector, renewable energy sources, agriculture, tourism, economic stability, comparative advantages, gas emission, economic efficiency, gross domestic product.*

Statement of the problem. The process of making necessary changes in the state's economic strategy has already become the requirements of the modern era, taking into account the modern challenges of the globalization process in the Republic of Azerbaijan, which is living its 32nd year of independence. The most important vector of these requirements is that the main part of the country's economy and state budget revenues are almost formed due to revenues from the oil sector. In the future period, more precisely, in the post-oil era, the acceleration of the socio-economic development of the country requires, first of all, the development of the non-oil sector. The development of the non-oil sector means, first of all, the income from the state budget to the oil account in the economy of oil-dependent countries is compensated by the income from the export of products produced in the non-oil sector. The development of the non-oil sector is, in fact, important in terms of preventing the Dutch syndrome in the economy. One of the most creative ways to develop the non-oil sector should be to diversify the economy. Diversification of the economy, first of all, consists in ensuring the increase of export revenues from various sources to the state budget by achieving the development of parallel fields in the structure of exports. At this time, it is also necessary to take into account that, due to diversification, it is necessary to achieve the provision of income from different areas, which should be aimed at preventing dependence on one area and neutralizing

the dependence of inputs from one area on the market connector. Taking into account all this, it can be concluded that in the post-oil era, the development of the non-oil sector should be achieved within the framework of the necessary measures to accelerate the socio-economic development of the Republic of Azerbaijan. It is impossible to accelerate the development of the country's economy in the future without achieving the development of the non-oil sector. Thus, the development of the non-oil sector, in fact, is becoming more relevant against the background of modern challenges of globalization.

It is necessary to admit that there are quite wide potential opportunities in terms of developing the non-oil sector in the Republic of Azerbaijan. In order to achieve the development of the non-oil sector in the current conditions, increasing the competitiveness of the products produced in the mentioned areas, as well as increasing the quality of the products, should be considered as one of the important conditions. As is known, the deepening globalization trends are characterized by the emergence of more global economic and financial crises. In addition, the serial nature of economic crises causes severe fluctuations in the international market as well as global markets. This process causes destructive trends in the economy of countries that depend only on the import of one product. Therefore, in order to develop the non-oil sector in the post-oil era in the Republic of Azerbaijan and increase the amount of income from this area to the state budget, a reliable foundation should be created, which should essentially lead to an increase in the amount of added value created in the economy and an increase in the number of jobs.

Analysis of recent studies and publications. The objective necessity of the development of the non-oil sector is determined, first of all, by the elimination of the Dutch disease, which may arise against the background of the increase in the volume of oil imports in oil-producing countries, as well as the implementation of necessary measures in the direction of economic diversification. In general, the development of the non-oil sector reflects a set of measures aimed at eliminating dependence on oil, and quite a number of scientific ideas can be found in world scientific publications in

this direction. Many oil-rich countries have not been able to direct their oil revenues to improve the standard of living of their citizens. Of the 48 countries where oil exports accounted for more than 30% of total exports between 1965 and 1995, almost half were ranked at the bottom of the 2002 UN human development report. The report ranks countries according to poverty, education, health and other indicators of quality of life. Only 1/4 of these countries occupy the top 3/1 of the list, and many of them, such as Norway and Canada, achieved this before oil exports became a major source of income. Oxfam's study shows that oil and other mineral resources not only do not reduce poverty, but actually increase it [10]. In fact, it is possible to agree with the author's opinion that, especially when approaching the problem from the point of view of the increase in the level of poverty in African countries, it is indeed possible to conclude that oil and other mineral resources do not really reduce poverty. At the same time, the more the income obtained from the export of oil and other natural resources takes a dominant position in the country's economy, the more it can prevent food shortages and the development of other areas, and actually increases the level of poverty.

The destructive tendencies that can arise in the background of the emergence of the economy's dependence on oil have manifested themselves more sharply, especially in the background of the increase in the level of inflation. In this regard, the term Dutch disease, which has maintained its popularity in the modern realities of the world economy, has not lost its relevance today. The term Dutch disease was introduced in 1977 by The Economist magazine. The effect got its name from the Groningen gas field, which was discovered in 1959 in the north of the Netherlands. The rapid growth of gas exports due to field development in the 70s of the last century led to an increase in inflation and unemployment, and a decrease in the growth rates of exports and incomes of manufactured products. The rise in oil prices in the mid-70s and early 80s of the last century led to similar manifestations in Saudi Arabia, Nigeria, and Mexico [19]. When oil prices are high, governments spend heavily and hardly justify their savings for crisis situations. Often, the government

also embarks on ambitious long-term and capital-intensive projects to capitalize on incoming revenues. But budgets designed for a certain level of oil prices have to be cut if the price changes significantly. At this time, in fact, drastic budget changes are very harmful. Governments often have to borrow to finance their obligations during oil booms. When the price of oil is low, the government has to borrow on unfavorable terms, which leads to the accumulation of a lot of debt on those countries [13]. According to Doctor of Economic Sciences, Professor Rufat Guliyev, the process of increasing the volume of income from oil is cyclical in some cases and depends more on economic crises and especially oil crises. Per capita income in Saudi Arabia decreased from 28,600 US dollars in 1981 to 6,800 US dollars in 2001. Equator's foreign debt was equal to 217 million US dollars in 1972, when oil was discovered there, and in 2002, this indicator rose to 11.8 billion US dollars. In Angola, as noted by the International Monetary Fund, more than one billion oil money almost "disappears" every year. In general, the abundance of natural resources in some cases makes it difficult to transition to a market economy and stimulate the development of free enterprise. One of the main reasons for this is that the economy's reaction to reforms is quite slow. Another reason is that the government has overly optimistic hopes for future oil revenues [12, p. 382]. In general, the optimistic forecasts of the governments of the oil-exporting countries regarding the income from oil, in a number of cases, in particular, in the framework of large-scale borrowing against the background of sharp financial crises and falling oil prices, almost end on pessimistic notes. This causes destructive trends in the social, political and economic life of countries that do not diversify their economy.

In addition to agreeing with certain points in Professor Rufat Guliyev's opinion, we would also like to add that Saudi Arabia and Norway, among the world's oil exporting countries, have taken necessary measures to diversify the economy, which conditions the efficient use of oil revenues. In fact, quite positive trends towards the development of the non-oil sector are evident in the mentioned countries.

It is true that it is necessary to admit that in the 70s and 80s of the last century, the attempt to reform agriculture in the direction of developing the non-oil sector in Saudi Arabia failed in one way or another. For example, in the 70s of the last century, the government of Saudi Arabia began to implement the necessary measures towards the implementation of the import substitution program. Under the name of the state grain policy, the Saudi Arabian economy was planned to be completely free from imports under the development program. To achieve the goals, first of all, state subsidies and import-limiting customs tariffs were introduced. To achieve the goals, first of all, state subsidies and import-limiting customs tariffs were introduced. The government provided a certain amount of subsidies to agribusinesses for manure, seeds, irrigation, machinery and wages. In addition, farmers began to buy grain 3 times more expensive than the world price. As a result, production increased 26 times, from 200,000 tons in 1980 to 4 million tons in 1992. More than 500,000 tons of net import in the 80s of the last century turned into 2 million tons of net export in 1992. In general, it is no coincidence that in the early 90s of the last century, Saudi Arabia became the 6th largest exporter of wheat in the world [14, p. 239-246].

In our opinion, the most important factor that caused the development of the non-oil sector in Saudi Arabia to be ineffective was the dominant position of religious politics in the country. So, in fact, the development of the non-oil sector, especially in agriculture, which is one of its most important sectors, had to be subordinated to the interests of agrarian business, that is, commercial processes. However, the policy implemented in the country, in fact, prioritized generous food aid to African countries in this area. All this, in fact, did not promise significant progress in the development of agriculture as an important component of the non-oil sector. However, the fact that the country was the 6th largest grain exporter in the world in the 90s can be characterized as vectors of positive progress in this field.

The conducted studies show that among the oil exporting countries, Norway can be considered the country that is relatively less dependent on oil. In fact, this is due to the fact that the mentioned country has significantly less dependence on the

hydrocarbon market compared to other oil-producing countries, and at the same time, it uses oil inputs effectively. Currently, in 2006, GDP per capita exceeded 60,000 US dollars, and about 20,000 dollars of this indicator is made up of the hydrocarbon market. In general, the GDP is significantly higher than that of Eastern European countries, but lower than that of neighboring Sweden, the Netherlands, and Central European countries [11, p. 165-166] .

It should be noted that the need to develop the non-oil sector in oil-producing and oil-exporting countries is also due to the fact that countries around the world give more preference to green energy. As we mentioned above, this process is explained by the preservation of the ecological balance, but in fact, it is aimed at neutralizing the dependence of developed industrial powers on the countries that export raw materials from time to time.

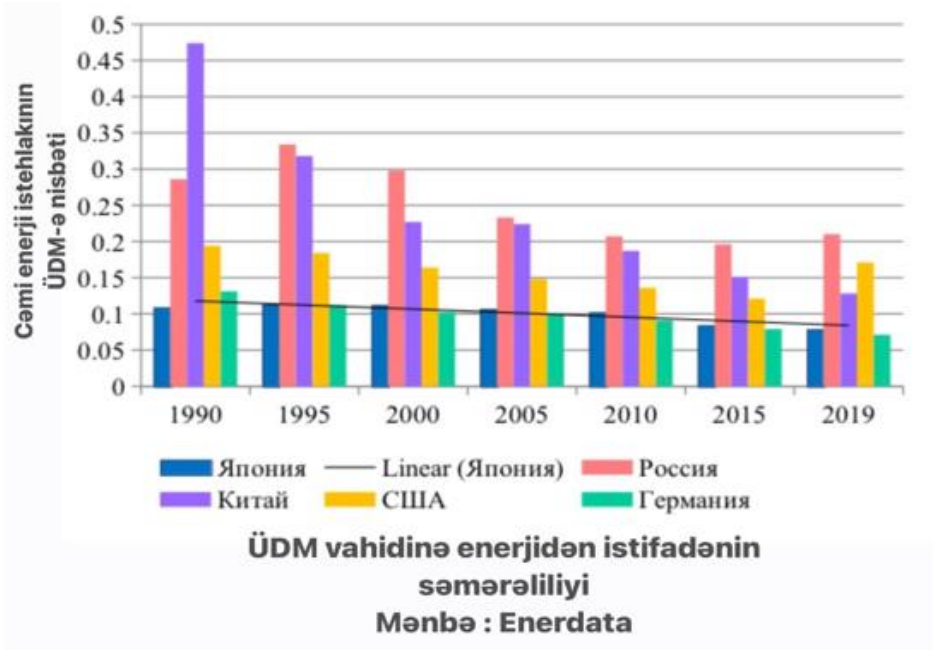
The concept of green economy was first introduced into the scientific circulation in 1989, focusing on a more harmonious reconciliation of economic and environmental issues [18, p. 192]. Despite the lack of a single point of view on the concept of green energy in the literature, or rather a single scientific approach, most experts justify it as the actualization of green energy use processes, the transition to the use of renewable energy sources, which are considered more sustainable than depleted mineral resources [15, p. 85].

As we mentioned above, the world energy market is actually quite sensitive to epidemics, crises, and military-political processes. For example, in 2020, an almost sharp decline was observed in the global oil products market. And this decrease was primarily closely related to the coronovirus pandemic. In 2021, due to the relaxation of the quarantine regime, an increase was observed in the world market of oil products. For example, in 2020, the volume of the world oil products market decreased by 9.2%, while in 2021, the world demand for oil products increased by 5%. In general, the largest consumer of oil products in the world in 2021 was the United States, which accounted for 17% of the world's consumption of products. However, despite all this, it should be noted that in European countries, especially in

Germany, a decrease in the demand for oil products was observed, which was caused by a 2.9% decrease. (Enerdata data on world energy and climate annual, 2022).

In general, during the last 30 years, a decrease in the intensity of energy used per unit of gross domestic product has been observed.

In Japan, after the "Oil shocks" of the 70s of the last century, the development of the policy of energy saving and reduction of the need for fossil fuels began to be observed. Thus, for the 70-90 years of the last century, the energy efficiency of the economy increased by 35% in Japan. And the mentioned country has achieved the highest energy efficiency index in the world in all industrial fields. However, in the period after the 90s of the last century, or rather, including 2010, environmental protection issues and global climate change problems are more evident in the energy conservation policy. Priority transfers in one way or another are observed in state policy. And this was primarily due to the preference of activities directed to the expansion of measures to reduce greenhouse gas emissions[9, p. 19-20]. The intensity of energy consumption per unit of GDP is shown as follows:



ÜDM vahidinə enerjidən istifadənin səmərəliliyi
Mənbə : Enerdata

As can be seen from the picture, energy intensity in the Japanese economy is one of the lowest in the world. In 2019, Japan's energy intensity index was 2.7 times lower than the corresponding index of Russia, 2.2 times lower than the corresponding index of the United States, and 1.6 times lower than the corresponding index of

China. Even in 2019, the indicator of the intensity of energy consumption per product unit in Japan was even lower compared to Germany. This allows us to conclude that energy efficiency in Japan is higher than in Germany.

Therefore, summarizing the above-mentioned, it can be concluded that such a trend is more evident in international publications that the transition to green energy is accompanied by a significant limitation of oil and gas consumption. And taking into account all this, there is a greater need to strengthen measures aimed at the development of the non-oil sector in oil-exporting countries, including in our republic. In general, in the near future, significant progress should be made in the field of development of the non-oil sector, which can essentially characterize the country's fundamental preparation for the post-oil era.

The purpose and tasks of the article. The purpose of the article is to prepare scientifically based and practical suggestions on accelerating the development of the non-oil sector in the Republic of Azerbaijan in the post-oil era. The duties of the article include:

- Analysis of adequate trends in the economy of oil-exporting countries as a result of connector fluctuations in the world oil market;

- Analysis of considerations related to the prevention of the destructive consequences of Holland's syndrome;

- Analysis of trends in the world energy resources market;

- Analysis of fluctuations in oil and gas consumption in the world in connection with the transition to green energy;

- Analysis of the current situation of the development of the non-oil sector of the Republic of Azerbaijan;

- Determining the priorities of the development of the non-oil sector in the Republic of Azerbaijan.

Main text. In modern conditions, where the process of globalization is deepening, ensuring the economic security of the Republic of Azerbaijan depends significantly on the development of the oil and gas sector. It should be taken into

account that the oil sector has played a decisive role in the economy of Azerbaijan since the former Soviet Union. After gaining independence, more precisely, in 1994, the signing of the century oil contracts in Azerbaijan was accompanied by large-scale investments in the oil sector of the economy. And the trends of rapid growth in the oil sector of the economy as a whole have also manifested themselves. Based on the data of the State Statistics Committee of the Republic of Azerbaijan, it can be concluded that the share of the mining industry in the industrial sector of the country's economy is 73.3% in 2018, 69.9% in 2019, 61.3% in 2021, and 61.3% in 2022. and it was 65.6% in the year. In the structure of the mining industry, the share of crude oil and natural gas production was 65.9% in 2018, 62.3% in 2019, 51.9% in 2021, and 61% in 2022[5, etc. 24]. In 2021, 34 million 580.3 tons of oil were produced in the Republic of Azerbaijan, which is 8.9% more than in 2018. Also, the volume of commercial oil production in the country was 34 million 513.3 tons in 2021, which is 8.9 times higher than in the comparable period. In 2021, 43 billion 867.3 million cubic meters of gas were produced in the Republic of Azerbaijan, which is 43.9% more than in 2018. The volume of commercial gas production in 2021 was 32 billion 578.3 million cubic meters, which is 69.6% more than in 2018 [5, p. 35-36].

Analyzing the structure of investments directed to fixed capital in the industry, it can be concluded that in the structure of investments as a whole, the volume of investments directed to the mining industry, including the oil-gas and natural gas production sector, is quite high. So, if in 2018 the volume of investments in the mining industry was 67.1% of the structure of total investments, in 2021 this indicator was equal to 64.2%. Investments in the crude oil and natural gas production sector accounted for 66.8% of investments in the mining industry as a whole in 2018, and 63% in 2021[5, p. 75]. From the analysis of statistical data, it can be concluded that in 2018-2021, a decrease in the volume of investments made in the mining industry, as well as in the crude oil and natural gas production sector is observed in one way or another.

It should be noted that since the beginning of the 2000s, a series of decrees and orders have been adopted by the country's president regarding the development of the oil sector of the economy. It should be taken into account that other regions of the Republic of Azerbaijan, with the exception of the Baku Agglomeration, almost have the potential to specialize in the development of the non-oil sector. By the order of the President of the Republic of Azerbaijan dated March 30, 2006, Azerbaijan Investment Company was established for the purpose of promotion of investments in the development of non-oil sectors of the economy, renewal of the material and technological base of existing enterprises in these sectors. In addition, in order to support the development of business activities, the entrepreneurship council operates under the president.

It can be noted that "The decree of the President of the Republic of Azerbaijan dated January 29, 2019 on the approval of the state program for the socio-economic development of the regions of the Republic of Azerbaijan in 2019-2023 is significant in the direction of the development of the non-oil sector and the attraction of foreign investments in this field." can be considered a state act. The presidential decree states that the development of the regions of the Republic of Azerbaijan is an important component of the sustainable socio-economic development strategy successfully implemented in the country. The implementation of the tasks provided for in the adopted and successfully implemented state programs in the field of regional development, as well as in the orders on additional measures for the socio-economic development of the regions, will contribute to the sustainable development of the non-oil sector in the country, the improvement of the quality of communal services and social infrastructure provision in the regions, and the further improvement of the entrepreneurial environment. , has given impetus to the increase of investment, the opening of new enterprises, jobs and, as a result, to increase the employment of the population and reduce the level of poverty. During the years 2004-2018, when the state programs were implemented, the gross domestic product increased 3.3 times, including 2.8 times in the non-oil sector, 2.6 times in industry, and 1.7 times in

agriculture. As a result of targeted measures implemented during this period, 2 million new jobs, 1.5 million of them permanent, more than 100 thousand enterprises were created in the country, unemployment decreased to 5%, and poverty level decreased to 5.1% [1]. The volume and structure of gross domestic product production in the oil-gas and non-oil-gas sectors of the economy is reflected in the following table:

Table: Structure and dynamics of gross domestic product production in the oil-gas and non-oil-gas sectors of the economy

Gross domestic product production in the oil-gas and non-oil-gas sectors of the economy

Table: compiled based on the data of the State Statistics Committee of the Republic of Azerbaijan, Azerbaijan national accounts, statistical collection, Baku, 2022, p. 19.

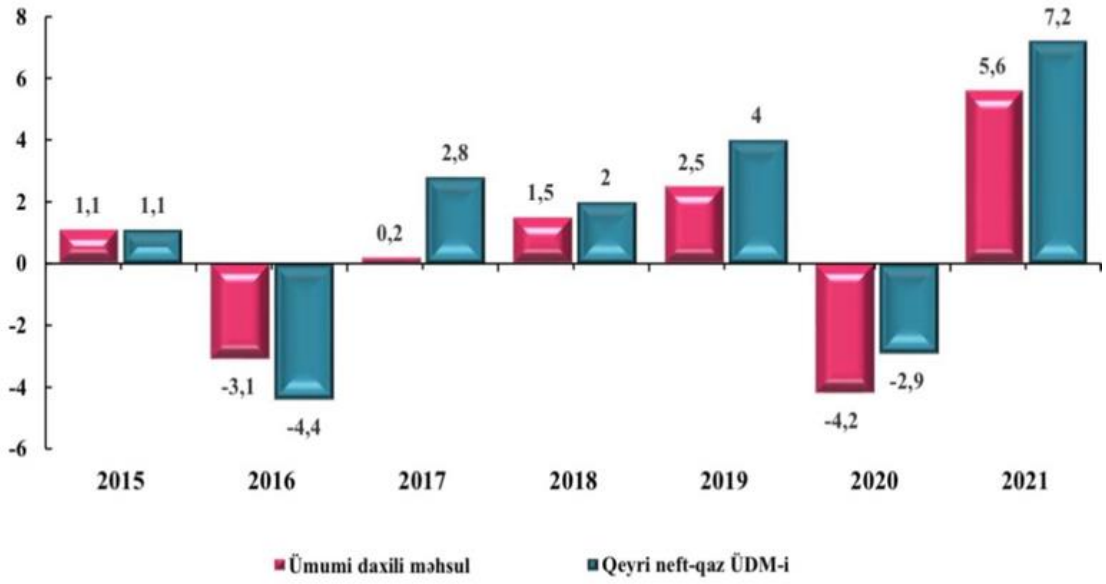
	2017	2018	2019	2020	2021	
Ümumi daxili məhsul - cəmi cari qiymətlərlə, mlyn. manat	**70 337,8**	**80 092,0**	**81 896,2**	**72 578,1**	**92 857,7**	***Gross domestic product - total current prices, mln.manats***
əvvəlki ilə nisbətən, faizlə	**100,2**	**101,5**	**102,5**	**95,8**	**105,6**	*as percentage of the pervious year*
o cümlədən:						*of which:*
neft-qaz sektoru cari qiymətlərlə, mlyn. manat	25 005,4	32 231,7	30 051,9	20 417,5	33 930,6	*oil-gas sector current prices, mln.manats*
əvvəlki ilə nisbətən, faizlə	94,7	100,5	100,4	93,5	101,2	*as percentage of the pervious year*
qeyri neft-qaz sektoru cari qiymətlərlə, mlyn. manat	40 328,0	41 662,0	44 481,8	45 312,2	51 082,9	*non oil-gas sector current prices, mln.manats*
əvvəlki ilə nisbətən, faizlə	102,8	102,0	104,0	97,1	107,1	*as percentage of the pervious year*
məhsula və idxala xalis vergilər cari qiymətlərlə, mlyn. manat	5 004,4	6 198,3	7 362,5	6 848,4	7 844,2	*net taxes on product and import current prices, mln.manats*
əvvəlki ilə nisbətən, faizlə	102,5	101,6	103,1	96,8	108,6	*as percentage of the pervious year*

As can be seen from the table, in 2021, compared to 2017, the volume of gross domestic product in the Republic of Azerbaijan at current prices was 92,857.7 million manats, which is 32% more than in 2017. The volume of GDP produced in the oil and gas sector in 2021 was 33,930.6 million manats, which is 35.6% more than in 2017. The volume of GDP produced in the non-oil and gas sector of the economy was equal to 51,082.9 million manats in 2021, which means an increase of 26.6%

compared to the comparable period. In general, as it can be seen, compared to the oil and gas sector, the growth of the GDP produced in the non-oil and gas sector of the economy was observed at a higher rate in the oil and gas sector.

The dynamics of growth and decline of GDP and non-oil-gas GDP compared to previous years are reflected in the following graph:

Chart: GDP and non-oil-gas GDP increase (decrease), compared to the previous year, in percent



Source: State Statistics Committee of the Republic of Azerbaijan, national accounts of Azerbaijan, statistical compilation (Baku, 2022, p. 10).

As can be seen from the graph, the highest dynamics in GDP growth was observed in 2021. In 2021, high GDP growth was observed in the non-oil sector, which was equal to 5.6 and 7.2%, respectively. Economist Igbal Mammadov believes that the development of the non-oil sector serves to make economic development dynamic and balanced. The development of the non-oil sector also plays an important role in preventing the dependence of the national economy and the state budget on oil. The development of the non-oil sector also has a direct impact on the political and economic development of the regions and the reduction of the level of poverty. The development of the non-oil sector prevents one product from taking a dominant

position in the structure of exports, and at the same time, it directly affects the neutralization of the dependence of product exports on fluctuations in the international market [7, p. 15]. In addition to agreeing with the author's opinion, we would also like to add that the regions of the Republic of Azerbaijan have a fairly high economic potential in terms of the development of the non-oil sector, which essentially creates favorable conditions for the implementation of necessary measures in the direction of the development of the non-oil sector in those regions. can In this regard, increasing the volume of investments in the non-oil sector of the economy is also important. In our opinion, in terms of increasing the volume of investments in the non-oil sector, the role of foreign investments should be high. First of all, this can be explained by the fact that foreign investments in the non-oil sector of the economy, in addition to being directed to the application of advanced technologies, can create favorable conditions for the implementation of competitive product production, in addition to the export of products produced in the non-oil and gas sector of the economy to foreign markets. able to create favorable conditions. Therefore, the attraction and stimulation of foreign investments in the non-oil and gas sector of the economy should be kept in focus. It should be taken into account that agriculture plays an important role in the structure of the non-oil and gas sector of the economy. However, it is a well-known fact that agriculture as a whole is quite dependent on natural risks, and the attraction of foreign investments should be stimulated in terms of risk insurance.

It should be taken into account that during the 44-day war in 2020, or rather, during the 2nd Karabakh war, the Republic of Azerbaijan liberated a significant part of its lands that had been occupied for up to 30 years, and from this point of view, there is enough non-oil in the liberated territories. there is potential for the development of the sector. Liberation of occupied territories for a long time promises new challenges and vectors for the economy of Azerbaijan as a whole, both geopolitically and from the point of view of globalization. So, in accordance with all these, with the decree of the President of the Republic of Azerbaijan dated July 7,

2021, "a new division of economic regions was formed in the Republic of Azerbaijan". According to the decree, 14 economic regions were established in our republic, which include the eastern Zangezur economic region and the Karabakh economic region, namely the territories freed from occupation. Khankendi city and Aghjabadi, Aghdam, Barda, Fuzuli, Khojaly, Khojavand, Shusha and Tartar regions are included in the Karabakh economic region, Jabrayil, Kalbajar, Gubadli, Lachin and Zangilan regions are included in the eastern Zangezur economic region[2]. Thus, it is possible to conclude in the research that there is a rich potential for the development of the non-oil sector in the field and territorial sections of the national economy of the Republic of Azerbaijan. Thus, in the structure of the economic potential of the territories freed from occupation, there are quite rich potentials in the field of agriculture and processing industry, as well as the production of mineral water, and the development of tourism.

One of the most important tasks in terms of economic development of the country is the development of the concept of regulating the production of food products by economic means in the territories freed from occupation, in particular, requires the implementation of appropriate credit, price, tax, investment, insurance and foreign economic policies, the formation and implementation of a system of state assistance to local commodity producers [8, p. 128-129]. In addition to agreeing with the author's views, it is also necessary to take into account that the territories freed from occupation have significant potentials in terms of the development of the non-oil sector in the territorial sections of the national economy of Azerbaijan, and the development of the processing industry in these regions, as well as the agriculture and food industry the development of integration relations between the two countries can increase the volume of competitive products produced in the field as a whole, which can create favorable conditions for reducing import dependence in the country.

As we mentioned above, a series of measures have been implemented in the direction of the development of the non-oil sector of the economy in the Republic of Azerbaijan, and in this regard, the sustainable development of the non-oil sector in

the strategic road map of the national economic perspective of the Republic of Azerbaijan, approved by the decree of the President of the Republic of Azerbaijan dated December 6, 2016 measures related to ensuring its development have been determined. The strategic roadmap notes that additional investment in the non-oil sector will be an important driver of a more competitive economy through 2025 and beyond. For this reason, in the future, foreign direct investments in the industrial and service sectors will be attracted on a larger scale. Investment in the non-oil sector by large foreign companies that offer technology, skills and access to global value chains will strengthen Azerbaijan's place on the global economic map. Foreign investors will be strategically attracted to Azerbaijan on 3 aspects:

- creation of extremely attractive investment opportunities (for example, industrial parks with modern infrastructure);

-targeted access to leading international companies;

- class I services for existing and future investors.

At the same time, it is mentioned in the 5th target indicators section of the strategic road map that the share of direct investments in the non-oil sector in the non-oil GDP from the current 2.67% to 4% by 2025 is an important condition. The role of foreign investors in the diversification of the economy is very important. Thus, the contribution of foreign investors is not limited to capital investment, but they also bring new skills, technologies and networking opportunities necessary to enter new sectors and value chains. It requires more investment in the non-oil sector of the economy [3, p.52-53].

As can be seen from the goals in the strategic road map, the perspective development of the non-oil sector is predicted to be developed primarily against the background of the manifestations of the post-industrial society. In other words, the diversification of the economy and at the same time the manifestations of the development of information technologies are important from the point of view of the development of the non-oil sector, and these processes imply the continuous export of products and services provided in the non-oil sector to foreign markets, which, in

fact, is the state can play an important role in ensuring the alternative of entering the budget.

As we mentioned above, there are quite diverse potential opportunities for the development of the non-oil sector in the field and territorial sections of the country's national economy. In this regard, the opportunities of the tourism sector, which is an important component of the non-oil sector, are greater.

Unfortunately, the possibilities of a number of service-oriented areas, first of all, the tourism sector, are used in our economic regions. Thus, despite the construction and commissioning of high-standard tourism enterprises in the southern, northern and western zones of the country in recent years, there is chaos. In this direction, the use of the high potential of the tourism sector and the transformation of this prospective sector of the economy - the service sector into one of the main economic sectors of our country, the creation of more new jobs and the formation of added value opportunities, and the increase of the share of the tourism sector in the structure of the economy are important conditions [6, p. 147]. In addition to agreeing with the author's views, we would like to add that there are tourism regions of the Republic of Azerbaijan with significant investment attractiveness as well as business attractiveness. Achieving noticeable progress in attracting tourism to those regions promises important prospects for our country in terms of the development of the non-oil sector.

As it is known, the tourism sector is a part of the non-oil sector, and at the same time, it is quite sensitively affected by changes in the external and internal environment as a whole. For example, the Covid-19 pandemic, which began in the spring of 2019, had a significant negative impact on the development of the tourism sector, as in all areas.

The World Travel and Tourism Council (WTTC) publishes forecasts of the impact of Covid-19 on the economy and different scenarios for the recovery of the tourism industry for different regions. In 2019, 330 million people worked in the tourism and travel sector. The specific weight of this sector in the global GDP is

10.3% (8.9 trillion US dollars). The share of tourism in the world export of services is about 28%. The impact of Covid-19 on the tourism and travel sector in general is characterized by job losses. Thus, global estimates of job losses range from 98.2 million to 197.5 million people. It was observed in the reduction of the specific weight in GDP. So, experts believe that this decrease is estimated from approximately 2.686 trillion to 5.543 trillion US dollars[16]. Based on the information of the State Statistics Committee of the Republic of Azerbaijan, it can be concluded that the number of tourist tickets sold to foreigners and stateless persons to travel to the territory of Azerbaijan was 11,469 in 2019, 771 in 2020, and 195 in 2021. Therefore, from the analysis of statistical data, it can be concluded that the number of foreign tourists who came to Azerbaijan in 2020 decreased by 10,698 people, and by 11,274 people in 2021 compared to 2019 [4, p. 15]. The effects of Covid-19 have also had a negative impact on the amount of added value created in the mentioned field as a whole in terms of tourism development. So, if the specific weight of the added value created in the areas typical for tourism in the country's gross domestic product was 4.5% in 2019, this indicator will increase to 1.95% in 2020, and 2.2% in 2021. fell down[4, p. 19]. The Covid-19 pandemic has had a significant impact on the number of employees in the enterprises engaged in the activities of travel agents and tour operators as a whole. So, if the number of employees working in the mentioned institutions was 2205 people in 2019, this indicator decreased to 1464 people in 2020 and 962 people in 2021. In other words, compared to 2019, in 2021, the number of employees in the enterprises of the tourism sector engaged only in the activities of travel agents and tour operators was reduced by 1243 people [4, p. 13].

Results and development prospects. There are quite wide economic potentials related to the development of the non-oil sector in Azerbaijan. In addition, the development of the non-oil sector plays an important role in ensuring the security of the national economy, creating added value, eliminating the dependence on oil of the state budget and the national economy as a whole, but despite all this, we can

conclude from our research that in the field of development of the non-oil sector there are also certain problems. These problems can include:

- the non-oil sector of the economy does not seem so attractive to foreign investors and business entities compared to the oil sector. This process has its own characteristics. Thus, there is a greater demand for the products produced in the oil sector, and during processing, these areas are considered to be quite modernized areas. It should be added that the oil sector of the economy, unlike the non-oil sector, is not so risky, and in this case, we mean agriculture in particular;

- there is still chaos and disorder in the development of the non-oil sector of the economy;

-compared to the oil sector, the volume of investments in the non-oil sector is significantly lower;

- noticeably low competitiveness of products and services provided in the non-oil sector of the economy;

- the low level of modernization of the non-oil sector of the economy;

- that the manifestations of the post-industrial society do not significantly penetrate the development of the non-oil sector, in other words, the non-oil sector does not use information, communication technologies and digital economic opportunities effectively;

- although a series of state programs aimed at the development of the non-oil sector have been adopted, problems are still being observed in the field of insurance, concessional conditions and crediting of this field and the application of various concessions related to the attraction of these foreign investments;

- failure to flexibly consider the experience of foreign countries in the field of developing the non-oil sector in terms of the country's natural economic characteristics.

Taking all this into account, it can be considered that the development of the non-oil sector in our country, especially in the post-oil era, is of great importance in terms of compensating the revenues from oil. Therefore, we consider it appropriate to

implement the following measures in the direction of the development of the non-oil sector:

- crediting the development of the non-oil sector on preferential terms;
- providing budget subsidies for the development of the non-oil sector;
- applying the necessary stimulating mechanisms related to the attraction of foreign investments in the development of the non-oil sector;
- creation of foreign joint ventures in the non-oil sector (agriculture, processing industry) and effective use of the unique positive aspects of this process;
- modernization of the field in order to provide competitive product production and service provision in the non-oil sector;
- copying the application of smart projects in agriculture and also in the processing industry in order to increase the role of the non-oil sector in the post-industrial society;
- increasing labor productivity in the non-oil sector and effectively using quality and non-price types of competitiveness during product production.

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Chemical sciences

THE STATE OF WATER IN THE COBALT(II)-COPPER(II) HYDROGENPHOSPHATES

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Abstract. *The hydrogenphosphates with the general formula $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ ($0<x\leq0.40$) were synthesized. The concentration of Co(II) and Cu(II) in their crystalline structure changes within the area of their homogeneity (from x=0 to x=0.40). Individuality of the hydrogenphosphates were proved.*

In accordance with modern presentations, the molecules of water in the crystal lattice of crystallohydrates are involved in interactions with cationic and anionic undergrate of salt, determining the mechanism of their dehydration. Knowledge of it is necessary for choosing the conditions for obtaining anhydrous salts, which are uses to create functional materials for various branches of science and industry.

Data on the state of water in solid solutions of hydrated phosphates of divalent metals of different protonation and hydration is sparse. Information on the systematic study of water state in the cobalt(II)-copper(II) hydrogenphosphates in literature is absent.

As objects researches used the cobalt(II)-copper(II) hydrogenphosphates of composition $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ ($0<x\leq0.40$) with different content of cobalt(II) and copper(II): $Co_{0,9}Cu_{0,1}HPO_4 \cdot 1.5H_2O$, $Co_{0,8}Cu_{0,2}HPO_4 \cdot 1.5H_2O$, $Co_{0,7}Cu_{0,3}HPO_4 \cdot 1.5H_2O$ and $Co_{0,55}Cu_{0,4}HPO_4 \cdot 1.5H_2O$. These samples were prepared

by reacting of phosphoric acid with a mechanical mixture of hydroxocarbonates at a fixed pH value within 2.2-2.4.

The methods of vibrational spectroscopy are the most informative for assessment of the OH groups of water molecules and protonated anion, their functional relation in the crystal lattice of crystalline hydrates

The state of water in cobalt(II)-copper(II) hydrogenphosphates and the influence of the cation nature on it by means of Infrared and Raman spectroscopy were investigated.

It was determined that there are two types of crystallographic non-identical water molecules that constitute the coordination surrounding of the cations in the structure of hydrogenphosphates $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ $(0<x\leq0.40)$. *These OH-groups of water molecules formed a hard system of different on strength and orientation of hydrogen bonds between molecules water and anion, also between the different OH-groups on the same molecule of water.*

The bond of OH-groups of phosphate tetrahedron is more labile. The influence of the cation nature on the asymmetry of the molecules of coordinated water, on the energy H-bonds, bonds $M^{II} – O (OH_2)$ *and P – OH were estimated. It was found that, impact of these bonds weaken with increasing content of copper(II) in composition of the hydrogenphosphates.*

Asymmetry of water molecules also decreased, while the bonds O – H coordinating water intensified with an increase a content of copper(II) in composition of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$. *HOH angle formed independent OH-groups of the water molecules is not changes.*

Keywords*: Hydrogenphosphates, hydrogen bond, coordinated water, vibrational spectroscopy*

Introduction. In accordance with modern presentations, the molecules of water in the crystal lattice of crystallohydrates are involved in interactions with cationic and anionic undergrate of salt, determining the mechanism of their

dehydration. Knowledge of it is necessary for choosing the conditions for obtaining anhydrous salts, which are uses to create functional materials for various branches of science and industry.

In hydrates of protonated phosphates, there are two types of H-bonds: involving protons of the hydrated anion and protons of water. Since the donor properties of protonated groups can vary widely, the interval of change in the value of the H-bond in these compounds is much larger than in average salts of the same cations. This determines the various properties of protonated phosphates and, first of all, the complication of their thermal dehydration reactions by the processes of water dissociation and anionic condensation [1, 2]. Therefore, correct data on the state of water molecules contained in the structures of crystal hydrates are necessary for characterizing, substantiating, and predicting the complications of the dehydration processes of hydrated phosphates by solidphase hydrolysis, the depth of which is also interconnected with the energy state of water molecules and protoncontaining groups.

For individual phosphates of divalent metals, some data on the state of water molecules in their crystal structures are given in works [3-8]. Studies of the state of water in the structure of the cobalt (II) hydrogenphosphate was not performed. Only a few works are known, in which the spectral characteristics of $CoHPO_4 \cdot 1.5H_2O$ and its dehydration products are given [3, 8].

Data on the state of water in solid solutions of hydrated phosphates of divalent metals of different protonation and hydration is sparse [4,5,9]. Information on the systematic study of water state in the cobalt(II)-copper(II) hydrogenphosphates in literature is absent.

The cobalt(II)-copper(II) hydrogenphosphates were synthesized in the form of a limited solid solution of substitution of the general formula $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$, where $0<x\leq0.40$. They are formed as a result of isomorphic substitution of cobalt(II) for copper(II) in the crystal lattice of $CoHPO_4 \cdot 1.5H_2O$, information about the structure of which is not available in the literature.

The hydrogenphosphates crystallize in the form of finely dispersed polycrystals, which complicates their X-ray structural analysis. Therefore, establishing the structural features of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$, the nature of the relationship between various structural and functional groups in their crystal lattice, including the state of OH-groups, is possible only by indirect methods.

The methods of vibrational spectroscopy are the most informative for assessment of the OH groups of water molecules and protonated anion, their functional relation in the crystal lattice of crystalline hydrates [10].

The aim of this work – by means of Infrared and Raman spectroscopy to investigate the state of water in the cobalt(II)-copper(II) hydrogenphosphates and to evaluate the influence of the nature of the cation on it.

Experimental. As objects researches used the cobalt(II)-copper(II) hydrogenphosphates of composition $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ ($0<x\leq0.40$) with different content of cobalt(II) and copper(II): $Co_{0,9}Cu_{0,1}HPO_4 \cdot 1.5H_2O$, $Co_{0,8}Cu_{0,2}HPO_4 \cdot 1.5H_2O$, $Co_{0,7}Cu_{0,3}HPO_4 \cdot 1.5H_2O$ and $Co_{0,55}Cu_{0,4}HPO_4 \cdot 1.5H_2O$. These samples were prepared by reacting of phosphoric acid (64.13 wt % P_2O_5) with a mechanical mixture of hydroxocarbonates at a fixed pH value within 2.2-2.4, similar to [11].

IR spectrums were recorded at 20ºC and -190ºC in the range of 400-4000 cm^{-1} on a spectrometers Specord 75 IR and Nexus - 470 with Fourier transformation and Omnic softwares. The samples were prepared by pressing of the fixed amount (0,05 mas.%) in the matrix of KBr. In addition, the suspension of hydrogenphosphates in a butyl alcohol, inflicted on a neutral fluorite substrate were used. For the improvement of stripes resolution and reduction of general background vaseline oil added in a suspension. The Raman spectrums registered on the spectrometer of DFS - 24 (a source of excitation is an argon laser, $\lambda_0 = 514.5$ nm).

In order to correctly assign the absorption bands caused by the fluctuations of protoncontaining groups, a comparative analysis of the IR and Raman spectrums of

the investigated solid solutions of phosphates and their deuteroanalogs, recorded at room temperature (20ºC) and when the sample is cooled to a temperature of -190 ºC, is carried out.

Results and discussion. According to the obtained data, in the IR spectrums of hydrogenphosphates of solid solution of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ different of composition, recorded at 20ºC, in the region of valence vibrations of OH-groups (3000-3600 cm^{-1}) are observed two absorption bands and deformation vibrations of water molecules (1550-1750 cm^{-1}) are observed two absorption bands. In the range of 1900-2800 cm^{-1}, a set of absorption bands characteristic of bands of type A, B and C are recordes. These bands are characteristic of the spectra of salts containing protonated anions. In the region of skeletal vibrations of the anion (400-1400 cm^{-1}) there are two separate bands at 1360 and 880 cm^{-1} and three groups of absorption bands in the ranges of 1080-980 cm^{-1}, 750-720 cm^{-1} and 580-510 cm^{-1} (Fig. 1).

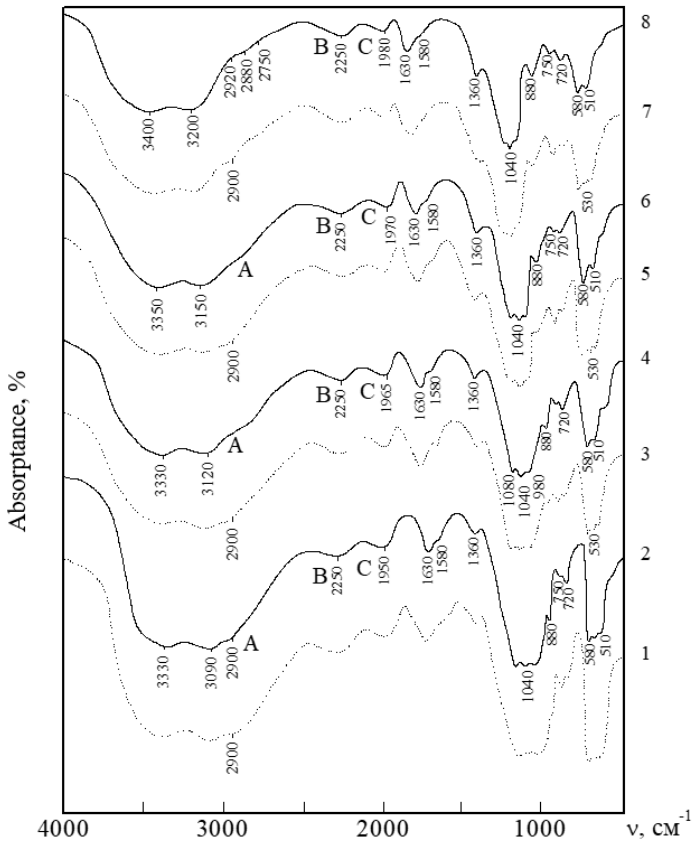

Fig. 1. IR spectrums of absorption of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ with x = 0 (1,2), 0.1 (3,4), 0.3 (5,6), 0.4 (7,8), recorded at 20°C (2, 4, 6, 8) and -190°C (1, 3, 5, 7)

In the Raman spectra of hydrogenphosphates Co(II)-Cu(II) in the area of ν(OH) molecules of the crystallization water, a wide band 2800-3600 cm^{-1} is recorded; in the range δ (H_2O) – the peak of low intensity with a maximum of 1640-1645 cm^{-1}. Four bands in the region 850-1100 cm^{-1} correspond to vibrations of the phosphate anion.

The decline of temperature does not make a fundamental difference in the nature of the hydrogenphosphates Co(II)-Cu(II) spectral curves (Fig. 1). In area of vibrations ν(OH) and δ(H_2O) in IR spectra, which were recorded at -190°C are observed two stripes of absorption, intensity of that increases in comparing to the analogical stripes in the spectra obtained at 20°C. Stripes of type A, B, C at -190°C become more contrast, their intensity increases; stripe A registers at 2900 cm^{-1}.

The decrease of the temperature in the range of fluctuations of phosphate anion led to a redistribution of the intensities of the bands 1360, 1040 cm^{-1} bands and groups of 750-720 cm^{-1}, 580-510 cm^{-1} in the direction of increasing the intensity of low-frequency lines. According to the spectral position of the maxima of these absorption bands and the sensitivity to temperature changes of the bands associated with the vibrations of groups containing protons, they can be correlated with the following vibrations: protonated anion: deformation planar δ(POH) – 1360 cm^{-1}, the low-frequency component of asymmetric valence vibrations ν_{as} – 1040 cm^{-1}, deformation out-of-plane γ(POH) – 750, 720 cm^{-1} and symmetric deformation vibrations δ(O_3PO) – 580, 530, 510 cm^{-1}.

The interpretation of infrared and Raman spectra showed that in the structure of hydrogenphosphates $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ there are two types of crystallographic unidentical water molecules, which are included in coordinating surroundings of cation. Two stripes δ(H_2O) indicate on it (1630 and 1580 cm^{-1}). Their presence in the IR spectrum, according to [1,10], is a identification sign of the presence in the crystalhydrate of water molecule as of structural unit. This is evidenced by the difference in the values of the maxima of bands ν(OH) in the spectra of Co(II)- Cu(II) hydrogenphosphates, which is 200-240 cm^{-1}.

The value of Δν for $Co_{0.9}Cu_{0.1}HPO_4 \cdot 1.5H_2O$, for example, is 210 cm^{-1} and is decreased to 200 cm^{-1} in IR spectrum of hydrogenphosphate with maximal content of copper(II) – $Co_{0.6}Cu_{0.4}HPO_4 \cdot 1.5H_2O$ (Fig.1). It allows to consider fluctuations each of the two OH-groups of the same water molecule as independent of each other and to consider that they are involved in the formation of different strength and directivity of H-bonds. Thus, HOH angle in water molecules does not depend on the composition of hydrogenphosphates. Practically identical values of δ (H_2O) maximums indicate this. The absence of significant changes in the δ(H_2O) in the spectra recorded at -190^{0}C, and large values of their frequency (1630 cm^{-1} comparing to frequency of vibrations of free molecule of water – 1595 cm^{-1}) indicate the existence in the structure of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ hard system of hydrogen bonds.

The comparative analysis of the IR spectrums of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ with various composition made it possible to distinguish two conventional spectral regions on the absorption curves. One of them is the range of 4000-1900 cm^{-1}, in which the influence of the cation nature on the state of OH-groups is quite significant. This area is typical of the stretching vibrations of the OH-groups of water molecules and the frequency components caused by fluctuations of the P – OH bonds of protonated anions, which form strong hydrogen bonds. The second range – 1900-400 cm^{-1}, in which changes in the spectra are not obvious. The same pattern of change in the shape of the spectral curve persists at low temperature survey (Fig. 1).

In area of ν(OH) of cationic sublattice two stripes are fixed, the spectral position of maxima of which varied depending on the composition of hydrogenphosphates. Thus the frequency of 3330 cm^{-1} characteristic $CoHPO_4 \cdot 1.5H_2O$ [8], remains unchanged and in IR spectrum of $Co_{0.9}Cu_{0.1}HPO_4 \cdot 1.5H_2O$. The maximum of this band is shifted to 3350 cm^{-1} by further increasing the copper(II) content in the composition $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ (up to x = 0.3). The shift reached its maximum value (70 cm^{-1}) in the IR spectrum of hydrogenphosphate, the composition of which corresponds to the saturated solid solution – $Co_{0.6}Cu_{0.4}HPO_4 \cdot 1.5H_2O$ (Fig. 1).

The changes in the value of the maximum of the second absorption band (from 3090 cm^{-1} to 3120 cm^{-1}), which is characterizes fluctuations in the OH-groups, involved in the formation of stronger hydrogen bonds, are records even in the IR spectrum of hydrogenphosphate, which consist of minimal content of copper(II) – $Co_{0.9}Cu_{0.1}HPO_4 \cdot 1.5H_2O$. Maximum shift value (110 cm^{-1}) of this band also was gained in the infrared spectrum $Co_{0.6}Cu_{0.4}HPO_4 \cdot 1.5H_2O$.

Most clearly the influence of the second cation in the state of OH-groups in the crystal lattice $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ registers in IR spectra hydrogenphosphates inflicted on fluorite substrate (Fig. 2).

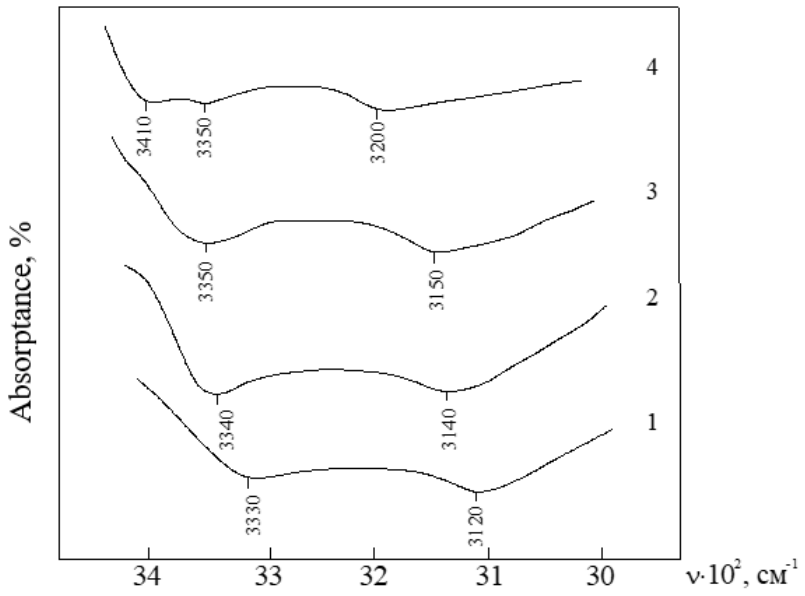

Fig. 2. IR spectrums of absorption of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ (20^0C) with x = 0.1 (1), 0.2 (2), 0.3 (3), 0.40 (4), were inflicted on a substrate from CaF_2.

In the spectrum of hydrogenphosphate with maximal content of copper (x = 0.40), except for displacement ν(OH) in a high-frequency range, is fixed splitting of the main absorption band (3400 cm^{-1}) on two frequencies – 3410 and 3350 cm^{-1}. The changes in the IR spectrums of hydrogenphosphates, that are observed increasing content of copper(II) in their composition, characterize attenuation in the structure of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ entire system of H-bonds. There are bonds between OH-

groups of water and anion, and between different OH-groups on the same molecule of water.

For the estimation the influence of cation nature on OH-groups protonated anion (P – OH) the comparative analysis of position in IR spectrums of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ of stripes of type A, B and C was perfomed. The changes in the group of absorption bands in the infrared spectra of hydrogenphosphates with different content of copper (II) were observed only for C band. The maximum of this band (1950 cm^{-1} for $CoHPO_4 \cdot 1.5H_2O$) shifted the high-frequency region of spectrum (to 1980 cm^{-1} for hydrogenphosphate with x = 0.40) with simultaneous reduction to intensity. Such character of changes indicate that phosphatic anions along with the water molecules were included in coordinating surroundings of cation. Consequently, changes of bond length of cation-ligand and degree of ionity in $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ were observed in IR spectrums. In case of substitution of cobalt to copper(II) these bonds weakened. This leads to a shift of the absorption maximum and intensity change of absorption band, which correlated with fluctuations of the protonated anion (Fig. 1).

In the second conditionally distinguished spectral interval, displacement maxima of absorption bands that characterize bonds OH-groups are virtually absent. The influence of cation nature was appeared only in the redistribution of intensities of individual lines. The most sensitive to the changes in cationic undergrate was the low-frequency component of asymmetric valence vibration of anion with a maximum of 1040 cm^{-1} (Fig.1). With an increase a content of copper(II) in composition of $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ intensity of this stripe of absorption increases. It is, respectively [1,10], by evidence of reduction of durability of bond, in this case of bond P – OH.

Conclusions. The state of water in cobalt(II)-copper(II) hydrogenphosphates with the general formula $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ ($0<x\leq0.40$) using the methods of vibrational spectroscopy was investigated. The influence of the cation nature on it was evaluated.

It was determined that there are two types of crystallographic non-identical water molecules that constitute the coordination surrounding of the cations in the structure of hydrogenphosphates $Co_{1-x}Cu_xHPO_4 \cdot 1.5H_2O$ ($0 < x \leq 0.40$). These OH-groups of water molecules formed a hard system of different on strength and orientation of hydrogen bonds between molecules water and anion, also between the different OH-groups on the same molecule of water.

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Medical sciences

FEATURES OF SPEECH THERAPY FOR PEOPLE WITH DYSPHAGIA

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Abstract. *The article presents cases of dysphagia in people with disorders of the nervous system due to diseases of various organ systems, gastrointestinal tract, tumors, etc. At different ages and due to different situations, a person may encounter neurodegenerative diseases, cerebral palsy, dementia, cerebral palsy (CI) accompanied by dysphagia. Dysphagia is characterized by difficulty or inability to swallow. According to a number of researchers, in adults it is mainly observed after cerebral palsy, and in children, in parallel with cerebral palsy, rhinolalia as a secondary disorder. There are few rehabilitation centers in Armenia where the work with dysphagia can be carried out with a complex medical, psycho-pedagogical approach and speech therapy. This is due to the fact that not all speech therapists*

can perform correct speech therapy intervention among persons with dysphagia, especially children. The results of our researches, as well as the lack of Armenian language literature, the incomplete awareness and training of specialists prove that the demand for clinical speech therapists in our country is quite high. The main specialists working with people with dysphagia are neurologists and speech therapists trained in various programs who are able to perform quality work.

As an example, experts invited from different countries of the world worked to overcome the dysphagia caused by the injuries of the soldiers who participated in the Artsakh wars. This circumstance gave us the opportunity to see the work of foreign specialists and cooperate with them. Our meetings and discussions with French-Armenian specialists allowed us to conclude that dysphagia in our country, unlike in European countries, occurs more often in children with cerebral palsy. The aim of our studies is to analyze the typical difficulties of persons with dysphagia, to present the features of the speech therapy work carried out with them during the rehabilitation work. We have studied and analyzed the practical experience of a number of foreign specialists, and combining it with the Armenian experience, we have presented a summary of the speech therapy work carried out with dysphagia in Armenia.

Keywords and phrases: *dysphagia, swallowing act, speech therapy, cerebral palsy of children (CPC), regulation of breathing and voice, speech therapy massage.*

INTRODUCTION. In recent years, the number of people with disorders of the nervous system has increased due to diseases of various organ systems, gastrointestinal tract, tumors, etc. At different ages and due to different situations, a person may encounter neurodegenerative diseases, cerebral palsy, dementia, cerebral palsy of children (CPC) accompanied by dysphagia. *Dysphagia* is characterized by difficulty or inability to swallow. According to a number of researchers, it is mainly observed in adults after cerebral palsy, and in children along with cerebral palsy,

rhinolalia, as a secondary disorder (Linievski Yu. V., Lineskaya K.Yu., Voronin K.A., 2008).

FUNDAMENTAL ISSUES: There are few rehabilitation centers in Armenia, where therapy with people with dysphagia can be carried out with a complex medical, psycho-pedagogical approach and from a speech therapy point of view. This is conditioned by the fact that not all speech therapists can perform correct speech therapy intervention among persons with dysphagia, especially children. The results of our conducted researches, as well as the lack of literature in Armenian, incomplete awareness and training of specialists prove that the demand for clinical speech therapists in our country is quite high.

The main specialists working with people with dysphagia are neurologists and speech therapists trained in various programs who are able to perform quality work. As an example, experts invited from different countries of the world worked to overcome the dysphagia caused by the injuries of the soldiers who took part in the Artsakh wars (in 2016 and 2020). This circumstance gave us an opportunity to follow the work of foreign specialists and to cooperate with them. Our meetings and discussions with French-Armenian specialists allowed us to conclude that dysphagia in our country, unlike European countries, occurs more often in children with cerebral palsy.

OBJECTIVE OF THE STUDY: The objective of these studies is to analyze the typical difficulties of people with dysphagia, to present the features of the speech therapy work carried out with them during the rehabilitation work. We have studied and analyzed the practical experience of a number of foreign specialists, and by combining it with the Armenian experience, we have presented a summary of the speech therapy carried out with people having dysphagia in Armenia. We have analyzed the results of the research and presented them in percentage terms in this article. Directions for the organization of speech therapy process with persons with dysphagia, a number of methodological approaches, which will contribute to the effective organization of the work of specialists, have been presented.

ESSESNCE OF THE STUDY

Dysphagia is a disorder of eating, swallowing, which is diagnosed in both adults and children. It is performed by a strong cough syndrome, salivation and difficulty in passing food to the throat [6, p. 5]. Disturbance of swallowing is one of the symptoms of many diseases, it is a sequence of coordinated, voluntary and involuntary (reflective) movements that ensures the movement of the content in the oral cavity to the esophagus and stomach [7, p. 9].

Dysphagia has a negative impact on a person's quality of life: it leads to complications of the respiratory system, becomes a cause of dehydration, metabolic disorders, cachexia and disability [7]; [8].

According to the French physiologist F. Dysphagia dysphagia is one of the most common sequelae of cerebral palsy, a traumatic brain injury. Along with dysphagia, there is a feature of the patient's psychological state, up to the development of a severe depressive state. In the case of dysphagia, the early start of rehabilitation work reduces as much as possible the risk of developing further complications: aspiration pneumonia, metabolic disorder, malnutrition, weakness-exhaustion, death [7, p. 8]. Dysphagia is diagnosed when the centers responsible for swallowing are disturbed. According to professional literature, 60% of patients after cerebral palsy have spasticity of frontal muscles, tongue, throat or esophagus. When liquid or food particles enter the respiratory system, complications arise not only for nutrition, but also for preventing aspiration pneumonia [6]; [3]. As a result, instead of actively recovering after a stroke, elder people face new problems. due to malnutrition and dehydration, the body's recovery potential is reduced, as there is a risk of airway obstruction. Disturbance of the functional interaction of the structures involved in the act of absorption causes the patient to eat poorly. Symptoms of neurogenic dysphagia may occur in case of sensory-motor nerve fiber dysfunction (J.R. Malagelada, F. Bazzoli, A. Elewaut A., 2004).

According to phonograph, phonoped specialist in voice disorders and their rehabilitation, Dr. A. A. Almazova (Almazova E. C. 1960), speech therapy work in dysphagia is organized in the following directions:

Regulation of breathing, the main purpose of which is to restore verbal breathing and coordinate the processes of breathing and voice production [4]; [6].

In the initial stage, **breathing exercises are performed** taking into account the severity of the patient's condition and the level of mental activity. E. F. Arkhipova, studying the speech therapy work carried out in the case of children with cerebral palsy, emphasized the regulation of breathing, which improves and activates the functional and self-regulating mechanisms of all organ systems. Below are some examples of breathing exercises:

- Blow and put out the candle /match/,
- Blow so that the flame of the candle/match/ waves, but does not go out,
- Blow and make soap bubbles,
- Blow through the wand to create bubbles in the water,
- Blow on the butterflies cut out of paper so that they move,
- Blow up the balloon, the paper petals to make it spin,
- Blowing to move the boat on the water, make waves on the water [2].
- etc.

Regulation of speech breathing. The main purpose of breathing exercises is to restore speech breathing and coordinate breathing and voice production processes [5];[6]. **Breathing exercises were also suggested for** (Rulle E.J.L., 1973).

1. Differentiation of nasal and oral breathing,

2. In order to form a prolonged exhalation under the control of the movements of the abdominal and abdominal muscles,

3. In order to develop the ability of uniform, rhythmic distribution of air while speaking [11].

According to E. V. Lavrova (Lavrova E.V., 1973) in case of dysphagia, the stages of implementation of speech therapy are the following:

- ❖ Selection of food type (selection of stability and degree of concentration of liquid and solid food) to ensure the energy requirement of the patient's body,
- ❖ Determining the correct position (creating conditions that facilitate the patient's food intake), feeding method and quantity,
- ❖ Stimulation of the sensitivity of the oral mucosa,
- ❖ Regulation of respiratory and vocal functions,
- ❖ Stimulation of absorption,
- ❖ Increase in the functional activity of the muscles involved in chewing and swallowing food: masticatory, facial and tongue muscles,
- ❖ Controlling the regular hygienic condition of the oral cavity,
- ❖ Providing information on feeding and oral hygiene to patients and their carers.

The next direction of the organization of speech therapy is the ***implementation of voice exercises*** aimed at the gradual activation and coordination of the neuromuscular apparatus of the larynx to restore the full voice process (Almazova E.S., 1960). E. S. Almazova suggests to take into account the following features when performing vocal exercises:

- ➢ **In case of hypo tonus,** activation of the muscles of the vocal apparatus,
- ➢ **In case of hyper tonus,** elimination of excess tension, restoration of voice leading kinesthesia (Lavrova E. V. 1973, Lavrova E. V., Taptapova S. L. 1984).

In order to prevent the strengthening of the pathological voice of patients and the occurrence of a neurotic reaction, voice rehabilitation should be started as early as possible [3]; [2]. Below are some examples of ***exercises for voice regulation***:

- ➢ Inhale, exhale through the mouth + sound - similar to a loud yawn,
- ➢ Inhale, exhale through the mouth + vowel / a, o, u, etc./,
- ➢ Pronounce single vowels long and smoothly,
- ➢ A, O, U, E, I, Y,
- ➢ Pronounce long and fluent phonemes consisting of 2, 3, 4 vowels.

For example:

- AA, AA ……
- AOA, AAO, AOU, AOE ....
- AOAO, AOOAOU, AOAOAO, AOOAOUAOU, AEAEAEAAE, AEOAEOAAEOAEO
- A - O, A-O, U-E, U-I....
- A-E-O, A-E-O, A-E-O……
- A-e-o -i, a-E-o -i, a-e-o -i, a-e-o -I....

The next direction of organization of speech therapy is the ***extra-verbal exercises and speech therapy massage.***

The main goal of speech therapy massage is: [2, page 7]

- to regulate the tone of the general, oral apparatus, facial muscles,
- to reduce the performance of hypo-dissolution and/or dissolution of the muscles of the oral apparatus,
- to reduce performance of pathological movements of the speech apparatus muscles (synkinesias, hyperkinesias, etc.),
- to stimulate proprioceptive senses,
- to improve the mobility of the reproductive organs,
- to activate the muscle groups of the peripheral speech apparatus,
- to form voluntary, coordinated movements of the oral organs.

Exercises aimed at swallowing regulation. In some cases, after a cerebral palsy, the patient's movement disorder may persist, which is quite an unpleasant feeling and worries the patient (Lavrova E.V., 1984). However, regular exercises aimed at strengthening the muscles that carry out swallowing action will help to improve and also completely restore the act of swallowing and avoid other interventions [3]; [4]. Among them are, for example, imitation of familiar movements:

- ✓ Coughing "Uh-Uh",
- ✓ Yawning with mouth wide open,

- ✓ Whistle without a sound, straining the oral cavity,
- ✓ Snoring,
- ✓ Imagine that there is food in the mouth, try to chew and swallow it,
- ✓ Pronounce the ***"m"*** sound as long as the exhaled air is sufficient.
- ✓ Sequential pronunciation of vowel sounds: "A, E, I, O, U".
- ✓ Sequentially pronounce the following sounds: "I-A", "I-A" (pronounce the sound "I" long and the sound "A" short),
- ✓ Keep the water in the mouth, gradually changing the position of the head,
- ✓ Pronunciation exercises.

E. F. Arkhipova who studies children's cerebral palsy and the disorders encountered in that case, suggested **oral and facial muscle exercises** from the point of view of regulating dysphagia

- ➢ Pronounce vowel sounds: ***a, e, i*** to activate the muscles of the soft palate. It is also recommended to pronounce the sounds ***a, a, a, e, e, e, e, i, i, i*** then ***ae, ae, ae, ea, ea, ea, ai, ai, ai, ai, ai, ai*** then ***ae, ae, ae, ae*** in a certain order.
- ➢ Raise eyebrows,
- ➢ Frowe eyebrows (get angry),
- ➢ Close eyes sequentially,
- ➢ Open and close eyes 3 times without interuption,
- ➢ Smile with closed mouth,
- ➢ Whistle,
- ➢ Show the upper teeth,
- ➢ Show the lower teeth,
- ➢ Smile so that both upper and lower teeth are visible,
- ➢ Blow and extinguish a lighted match,
- ➢ Rinse the mouth, moving the water from the right cheek to the left and vice versa, trying not to spill the water,
- ➢ Move air from one side of the mouth to the other,

➢ Round the lips by adopting the position of pronunciation of the **“o”** sound.

We conducted a survey among speech therapists and doctors regarding the specifics of work with people with dysphagia. Fifteen speech therapists, four oncologists, five neurologists participated in the survey from Yerevan "Erebuni" Medical Center, "Astghik" Medical Center, "Republican Children's Rehabilitation Center", "Yerazi Tun" Children's Rehabilitation Center, "Sors" Development and Day Care Center, as well as "Arabkir" Child Development and Rehabilitation Center of Artashat City and Aragatsotn from the "Kosh Children's Rehabilitation Center" institutions of Kosh region, Kosh community. As a result of our studies, we have found out that 50% of specialists were guided by an individual approach, 5% by the etiopathogenetic principle, 7% by a complex approach, 10% by accessibility, 15% by - the principle of a systematic approach, only 13% of speech therapists were guided by the principle of consistency and sequence.

It was also found out what kind of difficulties occur in working with people with dysphagia. The 5% of the specialists cited the presence of comorbidities as a difficulty, 10% cited the risk of aspiration, and another 10% cited the risk of patient suffocation. The 15% of the specialists who participated in the survey considered the age of the patient a difficulty and only 60% considered the patient’s condition important in the context of the difficulty.

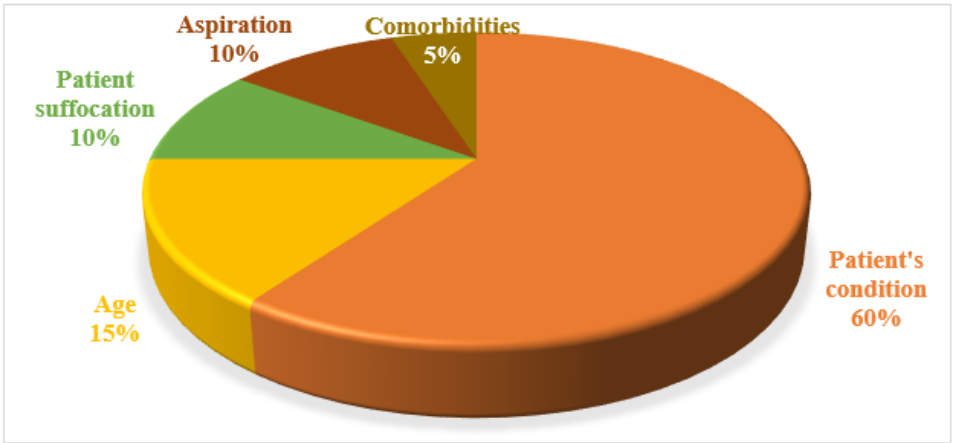

Diagram.1 Difficulties of speech therapy of people with dysphagia

The 5% of specialists mentioned that the change in voice is characteristic of people with dysphagia, 10% stated psychological fear, 10% identified salivation, 15% breathing difficulties, 15% chewing difficulties, 15% % - weight loss, and the remaining 20% reported lack of appetite as a feature.

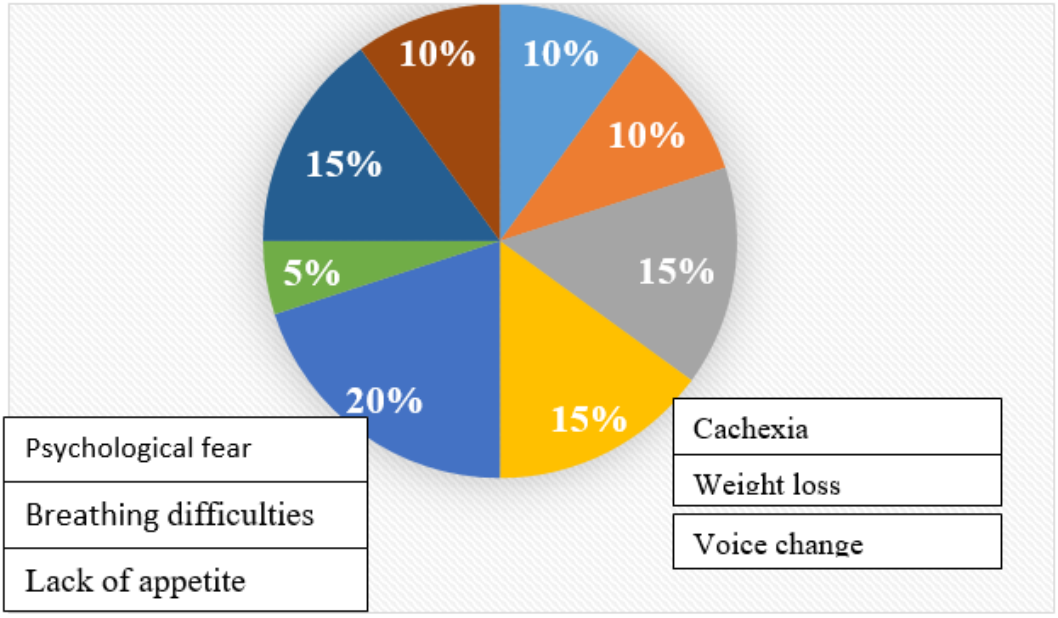

Diagram 2. Characteristics of people with dysphagia according to survey results

While performing speech therapy in case of dysphagia, it is necessary to take into account a number of general and unique principles: individual approach, etiopathogenetic, complex approach, simplicity, systematic approach, development, account of the mutual connection of speech and other mental processes, as well as the principles of consistency. Analyzing the results of our studies, we present a number of tips for people with swallowing disorder, following which will simply facilitate the rehabilitation activities carried out by specialists:

• Eat and drink only while sitting, if it is impossible to raise the head of the bed at least by 30 degrees.

• Maintain an upright position after eating.

• Take food slowly and in small portions, slightly lowering the chin to the chest, it facilitates the act of swallowing.

• The basis of the diet should be dense drinks and food (fermented foods: kissel, jelly, mashed potatoes, cutlets, soufflé, etc.),

• It is forbidden to use all crispy foods (biscuits, cereal foods, nuts, etc.). It's easy to get chocked by them.

• It is also not recommended to use meat and citrus fruits, because the fibers are very difficult to chew.

• It is not recommended to mix food and drinks. The patient can choose to drink before or after meals.

• After eating, make sure that there are no pieces of food left in the mouth, then rinse the mouth. If the patient is choking, he should be given the opportunity to cough. According to several authors, it is not recommended to drink at that time, because the liquid can easily enter the respiratory system (Evzelman M.A., 2006, Kogan O.G., Naidin V. L., 1988).

CONCLUSION: Our studies allow us to conclude that in most cases the lack of cooperation between specialists, the specialists' not fully understanding the problem and other issues often lead to a negative outcome. And as an observation, we can note that in order for specialists to be able to provide a timely and professional approach to people with speech disorders, it is necessary to develop the field of clinical speech therapy, prepare and train clinical speech therapists/neuro speech therapists. What will actually improve the condition of people with dysphagia, will overcome a number of these gaps, and will also contribute to the involvement of narrow specialists in the restoration of the swallowing act of people with dysphagia.

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Medical sciences

ORGANIZATION OF SPEECH THERAPY IN ONLINE EDUCATION CONDITIONS

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Abstract. *The development trends of the modern world lead to the fact that any work can be organized on the online platform, including the educational process. The field of special pedagogy, in particular speech therapy, is no exception. Computer programs, such as Skype or Zoom, help to successfully carry out work aimed at overcoming speech disorders in children, teenagers and adults. Speech therapy online work is a good alternative to organizing speech therapy classes if it is not possible to visit a speech therapist and organize an in the class [1].*

The introduction of computer technology today is a new approach in the educational process. Speech therapists not only did not stand aside, but were also actively involved in the process of widespread use of computer technology. Computer technologies are a powerful and effective tool for corrective work. They are included in the structure of traditional individual speech therapy classes as additional innovative elements, and in distance learning as the main ones. Currently, computer technologies are an important part of the education sector [2].

Keywords and phrases: *online learning, special pedagogy, speech therapy work, computer programs, information technology, speech disorders, cooperation*

INTRODUCTION. The result of the modern development trends of the world is the reality where any activity, including educational process, can be organized on online platform. The sphere of special pedagogy, in particular speech therapy, is no exception. Computer programs such as “Skype” or “Zoom” help to successfully carry out work aimed at overcoming speech disorders in children, adolescents and adults. Online speech therapy option is a good alternative opportunity for organizing speech therapy lessons, when it is not possible to attend a speech therapist and organize the class face-to-face [1] [5].

The introduction of computer technologies is a new approach in the educational process today. The speech therapists were not only not excluded, but also actively involved in the process of wide use of Information and Computer Technologies (ICT). Computer technologies represent a powerful and effective tool in correctional work. They are included in the structure of traditional individual speech therapy lessons as additional innovative elements, and in remote learning conditions as the main ones. Now computer technology is an integral part in educational sphere [2] [4].

FUNDAMENTAL ISSUES: In pandemic situation, almost all types of work: education, consultation, training, including the sphere of special pedagogy, in particular, speech therapy, were carried out online. Speech therapy process could be built based on the use of ICT and the use of Internet resources, which is different from traditional ways of teaching. Although both the specialists and the children were not ready to conduct training in that online format, nevertheless, in this way, the basis for cooperation establishment with the parent was made. Before the pandemic, speech therapy started and ended in the speech therapy room, but now with the online format, the involvement and participation of parents, especially parents of preschool and elementary school children, has increased dramatically.

OBJEVTIVE OF THE STUDY: The objective of this study is to identify the readiness level and attitude of parents of speech-impaired children and speech therapists working with these children towards the work carried out in online learning conditions. Importantly, there has been an evolution in parental attitudes toward distance learning from skeptical disregard to inspired team collaboration. With the participation and support of parents with the speech therapist, not only the preparation of the organs of the speech apparatus, but also the correct pronunciation of sounds, reinforcement of sounds, differentiation of sounds and other activities were successfully carried out. The need for closer and more active cooperation with pedagogues, pedagogue-psychologist, social pedagogue and pedagogue allows to implement multidisciplinary complex support for children with developmental disorders, particularly speech disorders [3].

Since the distance education implies individual learning, there is a problem of developing communication skills, desire and opportunities for students with peers. To solve this problem, speech therapists have actively used such a type of distance class as a teleconference. The speech therapist could communicate with two or three students at the same time through the "Skype" program (all video conference participants see each other on the screen). Also, school group events were held, in which the students participated with great interest, they found many new friends and became more friendly with each other [4].

ESSENCE OF STUDY

In general, there are several creative and positive results in distance education situation of speech therapy. Information technologies provide an opportunity to carry out more distinctive creative activities not only for the speech therapist, but also for the students. The speech therapists were able to compile educational materials and organize speech therapy classes using audio and video information, games and playing exercises, including online classes (the speech therapist makes a tab with a game, video or other information and opens it at the necessary moment of the course, showing it on the screen of the "Skype" program in display mode"). Despite the

created pandemic conditions, there has always been constant access to Internet resources, which in turn allowed speech therapists to use information-methodical and educational material, opportunities for students (and their parents), to implement interactive cooperation with the educational environment of the school (e-mail, "Skype" " program, through the school website) the speech therapist has posted relevant information for parents and students. The speech therapist also promptly modified, supplemented and updated the materials, used the possibilities of creating high-quality didactic materials and games based on Internet resources. For example, various exercises, games, quizzes and tests, various programs, including those in animational format, in the form of video slides or presentations, training manuals, etc. [5].

Conducting distance training is fundamentally a creative process, and each specialist creates his own methodological-didactic and informative-communicational base on the basis of information technologies. The practice of remote work proves that with proper organization of class hours and adaptation of existing programs, this format of conducting classes, taking into account the individual requests and desires of the student, provides tangible positive results in education of schoolchildren with speech problems.

Thus, if desired, the use of existing computer technologies in the course of distance learning becomes effective, interesting, and methodologically complete. We studied and conducted a survey among speech therapists regarding the organization of speech therapy in online learning conditions. The analysis of the results of the survey conducted with 26 speech therapists showed that during the pandemic, 90% of speech therapists also worked remotely in practice. Below is the data from our survey results.

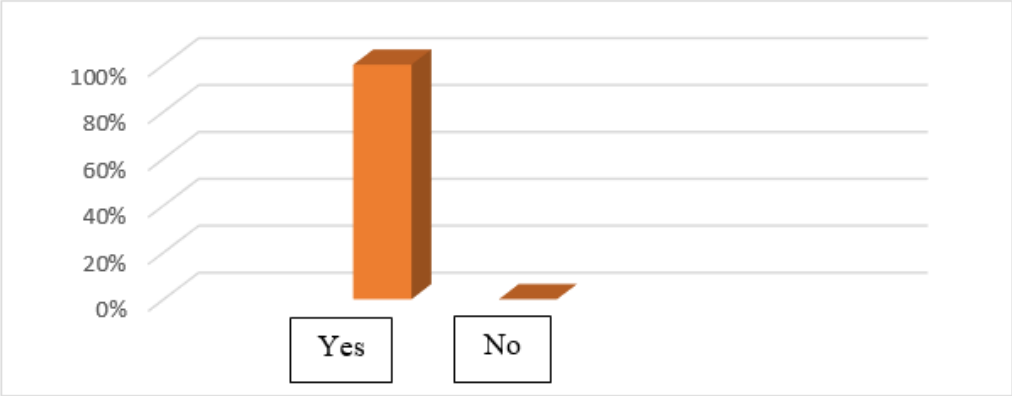

Diagram 1. Implementation of speech therapy in distance according to results of a survey conducted with speech therapists

When asked why children could miss speech therapy lessons, 42% of specialists replied it was due to the children's health condition, 31% due to the lack of necessary tools and Internet failure, 19% due to communication failure and the child's lack of concentration , and 8% answered that it was caused by the child's behavioral problem. Because there were cases when the child refused to approach the screen, and the work was done through the parent, that is, the task was given and explained to the parent, after which the parent did it with the child. And the video representing the entire work process was sent to the specialist.

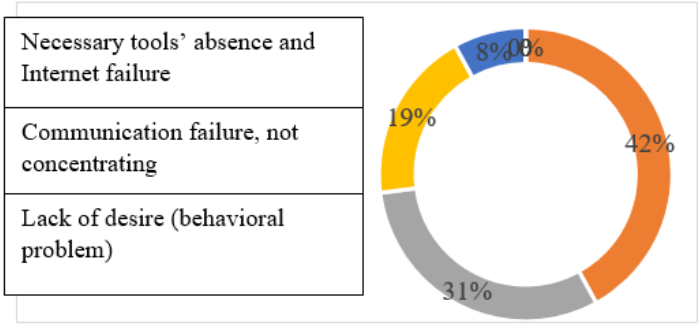

Diagram 2. Reasons for missing a speech therapy lesson according to results of a survey of speech therapists

We were interested in the question of whether children's motivation was fully satisfied during online lessons. 46% of the speech therapists who participated in the survey stated that the children's motivation was not sufficient at all, 12% mentioned

that it was mostly sufficient, and 42% stated that the lessons became complete only when the speech therapists made the work process even more interesting by using digital technologies, applying the method of encouragement (D3).

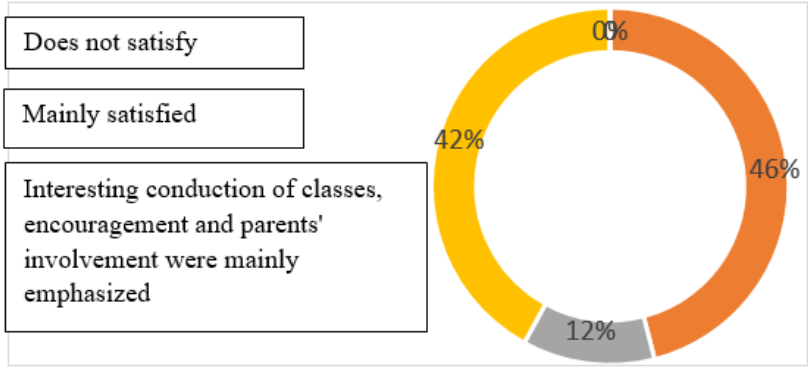

Diagram 3. Children's motivation for online lessons according to results of a survey conducted with speech therapists

We also tried to find out what kind of interest the children had in online lessons. 56.6% of the speech therapists stated that the children were interested, and 44.4% stated that they were not always interested (D4).

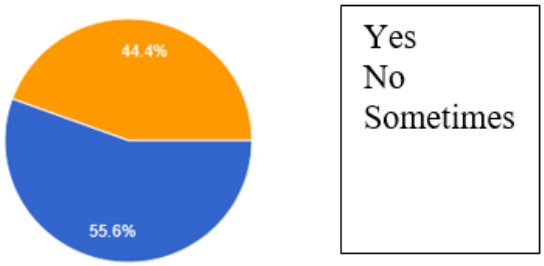

Diagram 4. Children's interest in speech therapy lessons according to results of a survey conducted with speech therapists

We tried to find out what were the negative aspects of online speech therapy lesson on the point of view of the speech therapists who participated in the survey. 69% of speech therapists mentioned the lack of face-to-face contact as a negative aspect of the options we proposed, and 31% mentioned the deterioration of communication and the child's lack of concentration during the lesson. (D5)

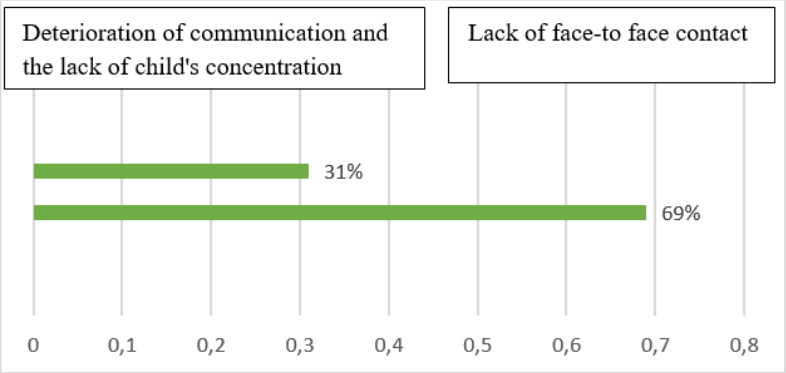

Diagram 5. Disadvantages of remote lessons according to results of a survey conducted with speech therapists

And when asked about the positive aspects of online speech therapy lessons for children, 31% of speech therapists mentioned the saving of resources (travel expenses, time), 8% stated that online lessons make it possible to use modern technologies even more at work during the lesson, 19% mentioned the high involvement of parents, and 42% found it difficult to answer the question (D6).

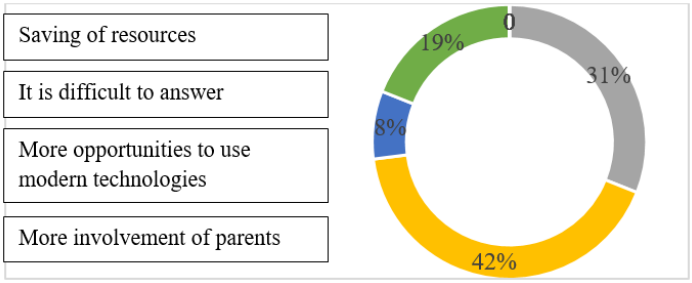

Diagram 6. Positive aspects of in distance speech therapy according to survey results

When asked what methods speech therapists have used during the distance speech therapy, they mostly indicated the ways of relying on encouragement, making some videos and presenting the material through them. The experts mentioned the following options: application of didactic games, familiarization and application of appropriate intervention techniques to parents. The specialists also noted that in order to overcome fatigue, the program was often modified so that the child could participate and be involved in the entire work process. However, there were

specialists who did not use any particular method. We also wanted to find out whether the duration of speech therapy was preserved, that is, 20-40 minutes, or whether there were some changes. 35% of specialists stated that the period was maintained, and 65% stated that there were some changes in the duration of work. In the online format, specialists worked for a shorter period of time (D7).

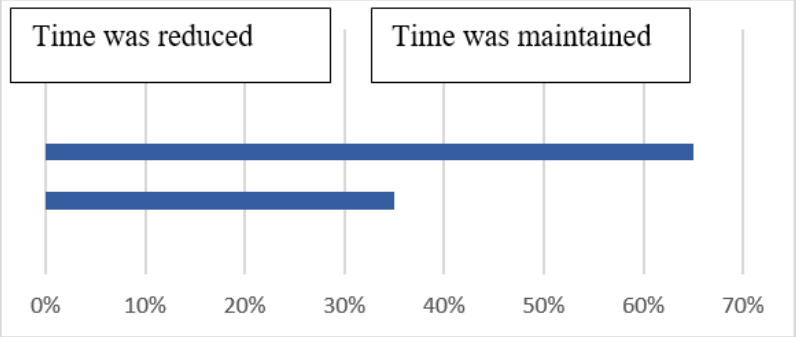

Diagram 7. Changes in the duration of in distance speech therapy

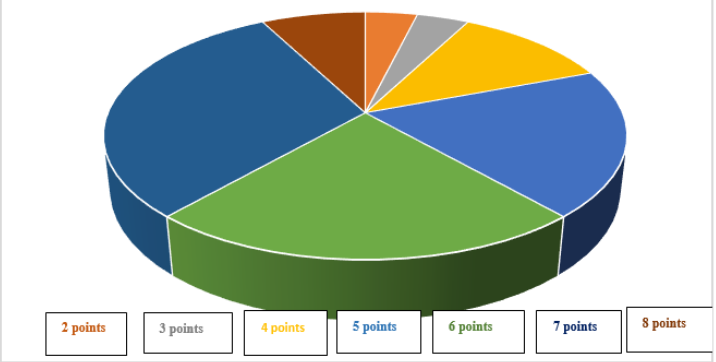

Diagram 8. Effectiveness of remote speech therapy evaluated by 1-10-point system, according to a survey conducted with speech therapists

Specialists tried to evaluate the effectiveness of online speech therapy evaluating it by 1-10 point grading system. 2.5% of them rated 2 points, 2.5% - 3 points, .5% - 8 points, 15% - 4 points, 20% - 5 points, 25% - 6 points, and 30% is 7 points (D8).

CONCLUSION: Summarizing the data obtained during the survey, it can be stated that according to specialists, children missed online speech therapy lessons due to their health condition, lack of necessary tools, communication failure, as well as

because of the child's lack of concentration. The specialists also mentioned that during online speech therapy lessons, children's motivation was generally not enough to complete a full session, although there were specialists who mentioned that it was full especially when the speech therapists have made the learning process even more interesting by using digital technologies, also they have always applied the method of encouragement, and also emphasized the involvement of parents in the activities being carried out.

The majority of specialists stated that children were nevertheless interested in online speech therapy lessons. The negative aspects of online speech therapy lessons are the lack of contact, the deterioration of communication and the child's lack of concentration during the lesson.

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Other professional sciences

THE EXTENT OF THE HUMAN RESOURCES INFORMATION SYSTEMS USE - ANALYSIS IN ENTERPRISES IN SLOVAKIA

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Abstract. *Over time, personnel work has evolved from personnel administration to the strategic position of human resource management. Currently, we are experiencing an overload of information, as it is all around us. Information and data are very important for the enterprises. Information and data must be collected not only for legislative reasons, but also to ensure and increase its performance. For that reason, information systems are an integral part of enterprises, saving time and costs. The gradual transition from supporting administrative activities to management activities also meant highlighting the importance of information necessary for human resources management. Just as various areas and tasks of human resource management are part of human resource management in an organization, personnel information systems are becoming an*

integral part of management. The reliability of information, which is the basis for decision-making regarding measures in human resources management, is becoming increasingly important. The paper presents the results of the analysis of the use of human resources information systems in industrial enterprises in Slovakia. The authors of the article chose a questionnaire as a research tool. Overall, 288 respondents from industrial enterprises of various sizes in Slovakia took part in the research. The collected data were evaluated through descriptive statistics. The results of the presented research showed that information technologies facilitate not only everyday life and work across industries, but also penetrate into partial areas of human resource management. The results of the research assume other research tendencies and spaces for discussion, which include the interconnection of the used information systems with information systems in the field of human resources management, duplication in data entry, and the acceptance of technologies by employees is an integral part.

Keywords: *human resource information systems, human resource management, industrial enterprises, employees, development*

Introduction

Despite the significant gradual development of managerial decision-making, information continues to be a key aspect of such decision-making. Information provides structure, intensity and certainty to the decision-making process. Thus, information systems gain importance in supporting and supplementing managerial decisions in contemporary organizations [1]. Human resource information systems (HRIS) is defined as an information system that is aimed at supporting human resource management (HRM) functions and activities, as well as broader organizational processes aimed at managing human resources. A more formal definition of an HRIS is a system used to collect, store, manipulate, analyse, retrieve and distribute information related to an organization's human resources to support HRM and management decisions [2]. An information system is expected to produce

complete, accurate, accessible, timely, consistent and clear data to aid meaningful decision-making. Unnecessary information complicates the decision-making process and should be avoided. HRIS helps not only in storing information about employees in its database, but also helps in managing almost all HRM functions [3,4]. An HRIS does not have to be explicitly a computerized system. HRIS may also include information stored in paper form. For computer and especially HRIS software support, one of the main purposes of HRIS implementation is to reduce the amount of time that human resources (HR) personnel must spend on personnel administration and record keeping activities, and to devote more time to planning, recruiting, training, or change management, and innovation management. These arguments are among the main justifications for a computerized system [2,5].

Therefore, the main aim of the paper is to present the results of the analysis of the use of human resources information systems in industrial enterprises in Slovakia.

Methods and Results

As part of formulating the research area, we set the main goal of the research, which was to analyse the extent (the scope) of the use of HR information systems in industrial enterprises in Slovakia. Along with the development of personnel work, the way of using human resources information systems is changing. With the advent of digitization and automation, there is a digitalization of human resource management activities. In the research, we focused on the form in which information representing the content of HR information systems is obtained, processed and used.

For the purposes of the research, three research questions were formulated:

Research question 1 (RQ1): How did the employees of the enterprises applyed their current employment?

Research question 2 (RQ2): How is employee attendance recorded in enterprises in Slovakia?

Research question 3 (RQ3): How are data transmitted and information obtained in partial areas of human resource management?

The chosen research tool was a questionnaire that was distributed to enterprises of various sizes. In total, respondents from 288 enterprises took part in the research. Respondents from large enterprises (250 or more employees) were most represented, which represents a total number of 169 respondents (58.68%), followed by respondents from medium-sized enterprises (50-250 employees), of which there were 66 (22.92%), then respondents from small enterprises (10-49 employees), of which there were 35 (12.15%) and the smallest part was represented by respondents from micro enterprises (up to 10 employees), of which there were 18 (6.25%).

Considering that the intention of the authors of the paper was to capture the answers of a wider range of HRIS users, research was focused on employees in various job positions. The distribution of respondents based on the representation of their job positions is shown in Table 1.

Table 1. Representation of respondents based on their job positions (own elaboration, 2022)

Item	**Absolute frequency**	**Relative frequency [%]**
Manufacturing employee	61	21.18
Administrative employee	91	31.60
Specialist employee	100	34.72
Manager - management employee	36	12.50
No answer	0	0
∑ Sum	288	100.00

From the data in Table 1, it follows that employees in specialist positions were most represented, followed by respondents in administrative positions, and smaller groups of respondents were represented by manufacturing employees and managers.

After analysing the research sample, the authors of the paper proceeded to evaluate the first research question.

RQ1: How did the employees of the enterprises learn about the possibility of their current employment?

When evaluating the first research question, the authors of the paper focused on the way how employees of organizations in Slovakia applied for a current job. The evaluation of the research question is shown through descriptive statistics in Table 2.

Table 2. Method of applying for current employment (own elaboration, 2022)

Item	**Absolute frequency**	**Relative frequency [%]**
The employer own online application	17	05.90
The internet advertising (Profesia, LinkedIn ...)	114	39.59
E-mail	35	12.15
In writing by post	17	5.90
Personally	93	32.29
Other answer	12	4.17
∑ Sum	288	100.00

As can be seen in Table 2, in addition to the options offered, the respondents also chose the option of other answer, while among the free answers there were options such as recruitment through an agency, by recommendation, through informal personal contacts, through acquaintances, or based on phone calls.

Subsequently, the authors of the paper proceeded to evaluate the second research question.

RQ2: How is employee attendance recorded in enterprises in Slovakia?

The purpose of the research question was to find out whether employers in Slovakia mainly use electronic systems for attendance records, e.g. in the form of an identification (ID) card, chip, etc. The responses of the respondents are shown in Table 3.

Table 3. Use of electronic attendance record systems (own elaboration, 2022)

Item	Absolute frequency	Relative frequency [%]
Yes	229	79.51
Partially / Sometimes	23	07.99
No	33	11.46
I do not know	3	01.04
Other answer	0	0
∑ Sum	288	100.00

As can be clearly seen from Table 3, electronic attendance record systems prevail among employers in Slovakia. From a practical point of view, however, it is important to be aware of the difference between working time records and attendance records. These terms are often incorrectly confused at work. The term attendance record refers to the employee's presence at the workplace and may not be consistent with his work performance. Pursuant to § 99 of the Labour Code, the employer is obliged to record the beginning and end of the time period in which the employee performed the work [6]. It is up to the voluntary choice of the employer which method of recording working time he chooses.

When evaluating the third research question, the authors of the paper focused on selected areas of human resource management.

RQ3: How are data transmitted and information obtained in partial areas of human resource management?

The results of the evaluation of research question 3 are shown using descriptive statistics in Tables 4 and 5. Table 4 shows the answers of the respondents regarding the transfer of information from selected areas of HRM in absolute frequency (AF) and relative frequency (RF).

Table 4. Method of transmitting information from selected areas of HRM regarding employee performance in absolute frequency (AF) and relative frequency (RF) (own elaboration, 2022)

The method used	Attendance		Work tasks		Work performances		Reasons for absence		Employee evaluation	
	AF	RF (%)	AF	RF (%)	AF	RF (%)	AF	RF (%)	AF	RF (%)
In written form	28	9.72	50	17.36	50	17.36	86	29.86	54	18.75
Electronically	232	80.56	164	56.94	161	55.90	148	51.39	134	46.53
Another form	10	3.47	70	24.31	33	11.46	46	15.97	80	27.78
No way	17	5.90	4	1.39	44	15.28	8	2.78	20	6.94
No answer	1	0.35	0	0	0	0	0	0	0	0
∑ Sum	288	100	288	100	288	100	288	100	288	100

As shown in Table 4, the electronic form of registration prevails in the registration of attendance and registration of work tasks. At least the electronic form of records is used in the evaluation of the employee. An important issue here is the use of employee evaluation when assigning work tasks, compatibility and coordination of related decisions.

Subsequently, the authors of the paper evaluated the respondents' answers to the transmission of information regarding changes and development possibilities in the organization. The answers are shown in Tables 6 and 7. Table 5 shows the answers of the respondents regarding the transfer of information from selected areas of HRM in absolute frequency (AF) and relative frequency (RF).

Table 5. Method of transmitting information from selected areas of HRM regarding changes and development opportunities in the organization in absolute frequency (AF) and relative frequency (RF) (own elaboration, 2022)

The method used	Education requirements		Suggestions for improvements		Information about the employee		Job offers in the enterprise		News in the enterprise		Current changes	
	AF	RF (%)	AF	RF (%)	AF	RF (%)	AF	RF (%)	AF	RF (%)	AF	RF (%)
In written form	48	16.67	62	21.53	90	31.25	35	12.15	37	12.85	34	11.81
Electronically	162	56.25	151	52.43	137	47.57	200	69.45	209	72.56	209	72.57
Another form	41	14.24	47	16.32	50	17.36	28	9.72	37	12.85	43	14.93
No way	37	12.84	28	9.72	11	3.82	25	8.68	5	1.74	2	0.69
No answer	0	0	0	0	0	0	0	0	0	0	0	0
∑ Sum	288	100	288	100	288	100	288	100	288	100	288	100

As can be seen from the data shown in Table 5, it follows that current changes, news in the company and new job offers are most often processed electronically. Information about the employee, i.e. changes regarding employees such as marital status, health insurance company, etc. are most often processed in other ways.

Discussion and conclusion

The results of the presented research show that the electronicization of HRIS is an unstoppable trend, while the introduction of digital tools is the key to successful

business in a modern information environment [7]. HRIS implementation brings many solutions and simplifications of operational work with human resources. On the other hand, it brings several questions and areas of improvement. The first area is the complementarity of HRIS with existing and used corporate information systems. Enterprises usually use different business information systems or management systems that are focused on partial functional areas. Thus, their compatibility or duplication when entering data becomes a challenge for the management of enterprises. The question of security when processing sensitive data about employees is also a non-negligible issue. Information technologies that enable easier processing and manipulation of personal data are interconnected with questions of protecting this data from misuse [8]. Another challenge is the area of technology acceptance. Many employees have difficulty accepting new technologies and learning to work with them. As the results of the already presented study showed, the information system of human resources really changed gradually. The human resource information system affects the work activities of employees to such an extent that it has become an essential priority for organizations to maintain the quality of HRIS [9]. Acceptance conditions for the adaptation of new technologies and factors affecting employee satisfaction with the systems used therefore become an important research area.

Acknowledgements

This paper is a part of the Operational Program Integrated Infra-structure within project “Research in the SANET network and possibilities of its further use and development”, code ITMS 313011W988, co-financed by the ERDF.

This paper was written with the support of the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences as a part of the project No. VEGA 1/0518/22 "Implementation of integrated management systems with value-oriented requirements for the construction of modular collaborative workplaces".

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Political sciences

FREQUENCY OF MANIPULATIVE BEHAVIOR OF PARENTS IN THE DIVORCE PROCESS

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Abstract. *The content of the work is oriented towards the issue of divorce with reference to the frequency of manipulative behavior of parents. Divorce is an event that is on the rise in modern society, and its consequences are far-reaching, both for former spouses and for joint children. Divorce ends a marriage, but it must not be the end of the family, especially when at least one child was born in the marriage. Some parents, in addition to dealing with their emotional reactions to divorce, find ways to provide their child with the support they need. Unfortunately, we also have those parents who do not recognize the child's reactions to divorce and the child remains deprived of the necessary support. Parents often, knowingly or unknowingly, involve children in partner conflicts. The manipulative behavior of parents manifests itself in different ways, such as making it difficult and impossible to meet with the other parent, false accusations of abuse, negative representation of the other parent, and others. Constant cooperation of experts, social workers, psychologists, pedagogues and lawyers can result in problem detection and timely reaction in order to protect children from the consequences of parents' manipulative behavior. Experts who deal with divorce and the consequences it leaves on the child advocate, as the best model, the joint exercise of parental rights after divorce. This would mean that they jointly*

and consensually exercise parental rights, that they have a joint parenting plan and that they agree on all issues related to the child. The research is oriented towards obtaining and analyzing the results in order to identify the problem of manipulation with special reference to its frequency. The increasing frequency of divorce obliges experts to look for preventive solutions to the problem, as well as ways to help ex-spouses and children overcome the problems brought about by divorce in order to minimize the manipulative behavior of parents. Analyzing the results of the research, the manipulative behavior of the parents in relation to the child exists in as many as 50.9%, compared to 49.1 parents who deny this behavior.

Keywords: *Divorce. Frequency of manipulation. Social support. Social work.*

INTRODUCTION

The family is a social institution that influences the destiny of an individual, and for that reason, it is in the sphere of scientific interest. Divorce, as a factor that contributes to the increase in the number of single-parent families, causes a high degree of stress on all its members and can have different and far-reaching consequences on the psychosocial development of children.

Divorce as a very complex psychosocial phenomenon includes individual and partner relationships, but it also reflects on the family as a whole. Divorce implies the termination of the union of legally married partners, but behind it is a complex process that takes place in stages and covers several levels of separation, i.e. the cessation of joint functioning of spouses and other family members. (Polovina, Žegarac, 2005)

The process of divorce takes years in some cases. It starts with arguments and conflicts before the divorce itself, continues during the divorce process and very often after it. The child often does not understand these changes and they reduce the predictability and stability that the family enjoyed until then. A high-conflict divorce implies the possibility of reaching an agreement on certain issues. Preoccupation with mutual partner conflicts can have such proportions that ex-spouses neglect the needs

of the child or start arguing and fighting over everything that concerns the child, convinced that they have to save the child from harm that could be committed by the other parent. When parents who are in a high conflict after divorce are characterized by a high level of hostility followed by malicious mutual accusations against the other parent, thereby involving the child in partnership conflicts, with the aim of obstructing a good relationship with the other parent, we speak of manipulative parenting.

Although some studies talk about the negative consequences of divorce on the child, it is becoming increasingly clear that the child is not harmed by the act of the parents' divorce itself, but by the parental conflict that is often present in all stages of the divorce.

In high-conflict divorces where conflicts between former partners are present, children's rights to the continued development of relations with both parents are violated, even though it is estimated that this is in their best interest. Manipulative behavior is resorted to by both parents through various behavioral, verbal and non-verbal messages that have a negative connotation about the other parent. The goal of these messages is to exclude the parents from the child's life.

A special risk in high-conflict divorces is the alienation of the child from the parents. Alienation is characterized by the behavior of parents who deliberately disrupt the child's relationship with the other parent (Roje Drapić, Buljan Flander, 2019).

The difficulties faced by a child who has gone through the experience of divorce are of a social, economic and health nature. The child's reactions to divorce certainly depend on the length and intensity of the parents' conflict, on the child's age, but also on the way the parents behave towards each other. Exposure to parental conflict, but also involving the child in it, enhances the appearance of psychosocial consequences in children. Some of those consequences are low self-esteem, learning disabilities and poorer school performance, anxiety, fears, and so on.

OBJECTIVE OF THE RESEARCH

The goal of our work is to determine the frequency of manipulative parenting in the divorce process. In the introductory part, we looked at the issue of high-conflict divorce and the consequences that such a divorce brings with it. When the manipulative behavior of the parents is present in the divorce process, the problem becomes even more complicated and requires special attention from experts as well as the protection of children in order to minimize the consequences on their psychophysical development. Research aimed at determining the frequency of manipulative parenting in the divorce process, as well as the most common forms of it, can contribute to the development of strategies to prevent or solve problems of this type that have already arisen. We conducted the research in Serbia, on the territory of the Municipality of Zrenjanin, including respondents from urban and suburban areas. Through the analysis, we obtained the results of the research that was conducted among respondents, mothers and fathers, who went through the experience of divorce and at least one child was born in the marriage. The research included 55 respondents, of which 34 were female and 21 were male.

RESEARCH METHOD

For our research, we have chosen a quantitative research method. The questionnaire is self-constructed, anonymous, and the parents' answers will give us a broader picture of the problem of the frequency of manipulative parenting. Guided by the set goal, which is to determine the frequency of occurrence of manipulative behavior of parents, we will present the obtained results in tables. We will analyze respondents' answers to 10 research questions.

INTERPRETATION OF RESEARCH RESULTS

Question number 1:

Degree of your education?

Table 1. Distribution of respondents in relation to the acquired education

LEVEL OF EDUCATION	NUMBER OF RESPONDENTS	EXPRESSED IN %
PRIMARY SCHOOL	7	12,7
SECONDARY SCHOOL	26	47,3
HIGHER PROFESSIONAL DEGREE OR MASTER'S DEGREE	22	40

In relation to the acquired education, by analyzing the obtained data, we obtained the following results: the largest number of respondents has an acquired secondary professional education 47.3%, followed by respondents who have completed a higher vocational education or master's degree 40% and finally respondents who have completed basic education 12 .7%.

Question number 2:

How did your marriage end?

Table 2. Distribution of respondents in relation to the way the marriage ended

METHOD OF TERMINATION OF MARRIAGE	NUMBER OF RESPONDENTS	EXPRESSED IN %
LAW FOR DIVORCE OF MARRIAGE	24	43,6
CONSENT DIVORCE	31	56,4

To the research question asked, which refers to the manner in which the marriage was terminated, the respondents were offered two answers, the termination of the marital union through a lawsuit for divorce and the consensual divorce. Out of a total of 55 respondents, 24 respondents answered that their marriage was ended by a lawsuit, and the other 31 respondents said that their marriage was ended by agreement.

Question number 3:

How to exercise parental rights after divorce?

Table 3. The schedule of respondents in relation to the way of exercising parental rights after divorce

METHOD OF EXERCISE OF PARENTAL RIGHTS AFTER DIVORCE	NUMBER OF RESPONDENTS	EXPRESSED IN %
INDEPENDENT EXERCISE OF PARENTAL RIGHTS	35	63,6
JOINT EXERCISE OF PARENTAL RIGHTS	20	36,4

The results obtained for this research question are as follows: after divorce, 35 respondents, or 63.6% of respondents, exercise parental rights independently, while 20 respondents, or 36.4%, exercise parental rights jointly.

Question number 4:

How often have your children witnessed marital disputes?

Table 4. Distribution of respondents according to the frequency of children's presence in marital disputes

FREQUENCY OF MARITAL DISPUTES	NUMBER OF RESPONDENTS	EXPRESSED IN %
SOMETIMES	22	40
OFTEN	19	34,5
NEVER	14	25,5

Research question number 4, which refers to the frequency of the presence of children in marital disputes, respondents were offered three answers to which they gave their answers in the following percentage: As an answer, sometimes, 40% of respondents circled, 34.5 often circled % and "never", 25.5% of respondents.

Question number 5:

How is your communication with your ex-partner after the divorce?

Table 5. Display of communication with ex-partner after divorce

COMMUNICATION WITH A FORMER PARTNER	NUMBER OF RESPONDENTS	EXPRESSED IN %
WE HAVE NO COMMUNICATION	10	18,18
COMMUNICATION IS BAD	11	20
COMMUNICATION IS GOOD	19	34,55
WE ONLY COMMUNICATE THROUGH CHILDREN	15	27,27

Respondents could give one of 4 answers to this research question. 18.18% of respondents answered that they have no communication with their ex-partner. 20% of respondents answered that he has bad communication. 34.55% of respondents have good communication after divorce, and 27.27% communicate only through their children.

Question number 6:

What is the relationship of the child after the divorce with the parent with whom he does not live?

Statement A.,, The child should choose which side he will be on, that is, who he will be loyal to,,

Table 6. The child's relationship with the other parent after the divorce

DEGREE OF AGREEMENT	EXPRESSED IN %
I DO NOT AGREE AT ALL	20
I DO NOT AGREE	20
I'M NOT SURE	14,55
I AGREE	34,55
I TOTALLY AGREE	10,9

Statement B. "I don't prevent the relationship with the other parent, but I don't promote it either."

Table 7. The child's relationship with the other parent after the divorce

DEGREE OF AGREEMENT	EXPRESSED IN %
I DO NOT AGREE AT ALL	12,73
I DO NOT AGREE	9,09
I'M NOT SURE	16,37
I AGREE	41,81
I TOTALLY AGREE	20

Statement C "After the divorce, constructive co-parenting should be advocated."

Table 8. **The child's relationship with the other parent after the divorce**

DEGREE OF AGREEMENT	EXPRESSED IN %
I DO NOT AGREE AT ALL	10,9
I DO NOT AGREE	5,46
I'M NOT SURE	27,27
I AGREE	32,7
I TOTALLY AGREE	23,67

Statement D. "Encouraging contact with the ex-partner's extended family is not in the best interest of the child."

Table 9. **The child's relationship with the other parent after the divorce**

DEGREE OF AGREEMENT	EXPRESSED IN %
I DO NOT AGREE AT ALL	20
I DO NOT AGREE	34,55
I'M NOT SURE	27,27
I AGREE	9,09
I TOTALLY AGREE	9,09

This research question was presented in the form of a five-point Likert scale. This scale contains four statements concerning the child's co-parent relationship after divorce.

Question number 7:

Is your ex-partner trying to win the child over to his care by various means?

Table 10. Presentation of the existence of the parent's manipulative behavior in relation to the child

THE EXISTENCE OF MANIPULATIVE PROCEDURES	EXPRESSED IN %
YES	50,9
NOT	49,1

Respondents could give two types of answers to this research question: Yes or No. Respondents who answered in the affirmative should have supplemented their answer with an explanation of what those procedures were. Out of the total number of respondents, 28 respondents answered yes to this question, while 27 answered no. Out of the total affirmative answers, 26 respondents gave an explanation, while two respondents left this column empty. Some respondents indicated one form of manipulative behavior of the ex-partner as an answer, while some respondents indicated two or three forms of manipulative behavior of the parents. The most common responses of respondents who gave answers to these questions are:

The ex-partner tells the child all the worst about the other parent.

- Telling lies about life together in order to gain a child
- Bribing, manipulating money, buying anything the child wants
- Making false promises
- Inconsistent upbringing - the opposite of the upbringing of the other parent
- Preventing meeting with the other parent
- Represents the child of the other parent as the sole culprit for the divorce
- Lack of interest in upbringing and contact with the child

Question number 8:

How long did the divorce proceedings last in your case?

Table 11. Presentation of the duration of the divorce proceedings

NUMBER OF RESPONDENTS DURATION OF DIVORCE PROCEEDINGS	DURATION OF DIVORCE PROCEEDINGS
24	1-3 months
16	4-6 months
4	6-9 months
3	9-12 months
8	More than a year

Question number 9:

Did your social worker offer you the possibility to participate in some counseling procedure in order to avoid difficulties during the divorce proceedings?

Table 12. Presentation of respondents in relation to the offered possibility of inclusion in the counseling procedure in the divorce process

	NUMBER OF RESPONDENTS	EXPRESSED IN %
No, I was not offered such an opportunity	31	56,4
Yes, I was offered such an opportunity	24	43,6

Question number 10:

Have your children been offered expert treatment, counseling or psychological support during the divorce proceedings?

Table 13. Presentation of respondents in relation to the support provided to children by experts

	NUMBER OF RESPONDENTS	EXPRESSED IN %
Da	12	21,8
Ne	43	78,2

DISCUSSION OF RESEARCH RESULTS

When parents divorce, children are in a very disadvantageous position, because they depend on their parents and the divorce itself is out of their control. They cannot see the course and duration of the divorce as well as what its outcome will be. Children often lack information and skills to overcome this difficult situation (Žakula Desnica, 2010). Divorce is an extremely stressful experience for every child, which causes strong emotional reactions in him. Parents who themselves survive the divorce violently, struggling with their own emotions and losses, are not able to provide the child with much-needed support. In such situations, the child's needs, his emotional reactions to the parents' conflict, remain unrecognized and the child is deprived of much-needed support. (Filipović, Osmak-Franić, 2010).

Research question number four, which refers to the presence of children in marital disputes, the answers of our respondents indicate that 74.5% of children often or sometimes attended marital disputes. Tamara Žakula, right-winger, in her work "Poor-quality divorce and manipulation of children", states a similar result, which is that 71% of children witnessed parental verbal conflicts. Branka Čavarović Gabor, in her work entitled, Divorce of parents and symptoms of trauma in children, on page 74 (2008) states, Exposure to parental conflicts causes children of all ages to experience emotional and behavioral problems.

In the description of the communication of former partners after the divorce, 34.55% of the respondents state that they have good communication, and 64.45% of the respondents state that they have poor communication, no communication at all or

communicate through their children. In her book, Divorce and What About the Children, Lynn Evans says that one of the most harmful practices of divorcing parents is to use children as messengers. For constructive co-parenting after divorce, it is necessary to ignore disagreements and continue good cooperation on child-rearing issues. Macoby and Mnookin conducted a longitudinal study regarding the presence or absence of communication and agreement on issues related to a joint child, they came to similar results: 35% of respondents have strong communication, while 65% of respondents have weak communication (Profaca, 2010). The presentation of the level of communication between former partners is aimed at understanding this issue and finding new ways of family and individual interventions.

„Family members in two-way family communication express emotions and share information, and if there are problems in communication, they often prefer negative styles of interaction" (Mlinarević, 2022, p. 136).

In a situation where the parental conflict continues after the divorce and makes it difficult for the child to adapt to the new situation and disrupts the relationship with the other parent, we must think about appropriate forms of support for the parents after the divorce, which are based on the elements of empowerment and understanding of the parental conflict (Urbanc, 2020).

Further analyzing the results of the research, the sixth research question, which was offered in the form of statements and concerns the child's relationship with the other parent after the divorce, we obtained the following results: with statement number 1„ The child should choose which side he will be on, that is, who he will be loyal to „45.45% of respondents completely agree or agree, 40% of respondents completely disagree or disagree, while 14.55% of respondents gave the answer that they are not sure. If we consider that the conflict of loyalty has an extremely negative effect on the well-being of children, a percentage of 45.45% says that the problem is not negligible.

„Divorce is a period of conflict of loyalty for children, which parents can intensify with their mutual struggle for the child.„(Laklija et. al, 2005, p. 7).

The statement "I do not prevent the relationship with the other parent but I do not promote it either", the percentage of representation with 61.81% does not prevent the relationship but does not promote it either, 21.82% completely disagree, while 16.37% are not sure.

The statement, After the divorce, constructive co-parenting should be advocated, 56.37% of respondents fully agree or agree, 16.36% disagree with this statement and 27.27% are not sure. When it comes to the last statement from our questionnaire, Encouraging contact with the extended family of the ex-partner is not in the best interest of the child, 18.18% of respondents completely agree or agree, 54.55% do not agree at all or do not agree while27.27 % it's not sure. Analyzing these results, we can conclude that the manipulative influence of parents is present in many forms. A large percentage of the respondents agree that the involvement of both parents in the child's life after divorce should be enabled, that constructive joint parenting should be advocated, as well as encouraging the child's contact with the extended family of the ex-partner. However, when it comes to sending negative messages, preventing the meeting of the child and the ex-partner, putting the child in a situation to choose who will be loyal but does not improve the relationship with the other parent, about 50% of respondents - Gordana Filipović and Davorka Osmak Franjić in their work related to The manipulative interference of parents in the divorce process shows the data obtained by the research that during the divorce in 30% of cases, the child's right to meet and socialize with both parents is manipulated, which further results in preventing the child's right to develop communication. These results indicate the need for timely intervention in mediation between parents in the divorce process. In her research, Milana Ljubičić found that the protection of children by the other parent when the child's behavior is inappropriate exists in 31% of cases. As another form of manipulation, the author states that offering a coalition to a child exists in 25.2% of cases. Comparing the results of our research with the research of Milana Ljubićič, we conclude that the manipulative behavior of parents in the divorce process exists in a high percentage and in various forms.

Regardless of the circumstances, parents are expected to know the characteristics of children's development, to be able to establish quality family relationships, and to apply appropriate educational procedures (Pintar, 2019).

Presentation of the duration of the divorce procedure: 43.64% of the respondents said that the divorce lasted for a period of 3 months, 29.09% for a period of 6 months, and the remaining 27.27% of the respondents said that the divorce lasted for a year or more. Due to the specificity of this issue, we are of the opinion that the shorter duration of divorce proceedings reduces the space for the development of manipulative parenting.

The question related to support for parents and children by experts in CSW aimed at mapping institutional responses to the problem of manipulative parenting. Based on the results obtained, when it came to support for parents, more than half of the parents answered that there was no such possibility. And when it comes to children, the situation is even more alarming, as many as 72.8% of respondents answered that such an opportunity was not offered to their children. Marina Hugson is in your book, Too much responsibility, too little support, 2015. on page 87 states, "*Most of the interviewed parents have limited experience with CSW, and if it could be expected that their need for contacts is much greater. Experiences are mostly neutral or even negative,,*

Danka Radulović and Natalija Iignjtović in their work, Assessment of the negative consequences of divorce on minor children and possible interventions, state that numerous interventions have been developed with the aim of helping children in situations when their parents divorce. When it comes to checking their effectiveness, we do not have an extensive examination of the direct impact on children's adjustment. Valid evaluation studies highlight the beneficial effects of interventions aimed at reducing parental conflicts, improving the child's relationship with parents, improving parental competencies, and supporting children in schools.

CONCLUSION

Divorce is traumatic for the whole family, but parents must still be responsible for a quality relationship with their children even in such a difficult situation. Children who have faced the divorce of their parents show different emotional and behavioral problems. A well-ended marriage could be a new type of relationship between family members, and the child would not be deprived of much-needed support. In order to overcome the problems that this phenomenon brings with it, it is necessary to take into account all its consequences and amortize them in the best possible way. An explanation of the divorce in accordance with the age of the child, avoiding conflict in front of the child, not manipulating them, making the availability of both parents available to them, and providing help in overcoming possible self-accusation would ease the situation for the children. It is the duty of parents to continue being parents to their children even after the dissolution of the marriage union.

We are of the opinion that certain progress can be achieved through the active participation of relevant institutions, organizations and individuals in the social protection system, cooperating in the common interest of establishing a quality system of support and protection for the family that is falling apart. to compromise solutions that will be in the best interest of the children as well as the parents themselves.

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Technical sciences

THE PROPERTY OF LONG-TERM SELF-PROTECTION FROM DESTRUCTIVE PROCESSES OF HYDROGELS OF EQUIVALENTLY CROSS-LINKED POLYMERS CAPABLE OF CREATING INVERSE NANOSUSPENSION

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Abstract. *In the stated priority article of the corresponding scientific discovery theoretically substantiated and experimentally confirmeda previously unknown the property about long-term self-protection from destructive processes of hydrogels of equivalently crosslinked hydrophilic polymers, capable of creating reverse nanosuspension at the expense to absorbed bound water with different degrees of mineralization in the form of interconnected nanoheterogeneous associative of the colloidals water clusters, type crystalline liquids as a dispersed phase in*

nanostructured mesh cells of crosslinked polymers as a dispersion medium, the reverse nanosuspension at the same time acquires the properties of an ultra-resistant, high-viscosity mass with a visually rough (wavy) surface.The article includes the following sections: introduction; the objects and methods of research; results and their discussion; scientific and practical significance of a suspected scientific discovery; conclusions and references of literature data. The introduction provides a brief analysis of the data available in the literature and the corresponding conclusions that determine the goals and objectives of this work. Waters with various mineralizations (0;300000-400000 ppm) were used as objects of study: waste (formation) waters of oil fields "Northern Buzachi" (China "SINOPEC" Corporation); "Uzen" "Ozenmunaigas" JSC; Zhetybay" "Mangistaumunaigas" JSC ("NC "KazMunayGas" JSC-50% and 50% China); "Karazhanbasmunai" LLP ("NC "KazMunayGas" JSC-50% and CITIC Corporation Ltd of the China -50%); "Kalamkas" "Mangistaumunaigas" JSC, as well as distilled water and water from the Caspian Sea. The following grades were studied as hydrophilic polymers: MPAA-20; MPAA-10; PAA-20; PAA-10. Viscometry was the main research method. The results of the research and the corresponding conclusions unequivocally confirm the elements of the discovery set out in the formula of scientific discovery.

Scope: oilfield nanochemistry and nanophysics for increase oil recovery from layers, as well as in medicine and cosmetics for the manufacture of ointment drugs. This discovery in 2018 successfully passed pilot tests at four injection wells of the North Buzachi oil field in the Republic of Kazakhstan. The actual economic efficiency due to additional oil production is 2.24 million US dollars.

Keywords: *self-protection of hydrogels from destructive processes, reverse nanosuspension, "crystalline liquids" as a new hybrid state, reverse nanosuspension with a wavy surface.*

I.Introduction:

Hydrogel products constitute a group of polymeric materials, the hydrophilic structure of which renders them capable of holding large amounts of water in their three-dimensional networks. Extensive employment of these products in a number of industrial and environmental areas of application is considered to be of prime importance. As expected, natural hydrogels were gradually replaced by synthetic types due to their higher water absorption capacity, long service life, and wide varieties of raw chemical resources. Literature on this subject was found to be expanding, especially in the scientific areas of research [1].

Hydrophilic gels, commonly referred to as hydrogels, are networks of polymer chains, sometimes found as colloidal gels, in which water has been commonly accepted as the dispersion medium [1, 2]. It should be noted that one cannot agree with this conclusion, since The essence of the project of the scientific discovery of the authors of this article indicates the opposite: water is a dispersed medium, and the nanostructured mesh cells of cross-linked polymers together perform the function of a dispersion medium. Researchers have defined hydrogels in different ways over the years. The most common of them is that the hydrogel is a water-swollen and cross-linked polymer network obtained by a simple reaction of one or several monomers [1, 3–5]. The ability of hydrogels to absorb water arises in the presence of active hydrophilic functional groups (COOH, -OH, -$CONH_2$, -NH_2, -SO_3H, etc.) in the polymer chain.

During last three decades, natural Hydrogels were gradually replaced by synthetic hydrogels which has long service life, high capacity of water absorption, and high gel strength [1, 6]. The polymer engineer can design and synthesize polymer networks with molecular-scale control over structure such as cross-linking density and with tailored properties, such as biodegradation, mechanical strength, and chemical and biological response to stimuli [1, 7]. The issues of classification of hydrogels according to various characteristics have been studied by many authors [1] {classification based on source (natural or synthetic origins) [8]; classification

according to polymeric composition (homopolymeric hydrogels [9]; copolymeric hydrogels [10]; multipolymer Interpenetrating polymeric hydrogel (IPN), in semi-IPN hydrogel, one component is a cross-linked polymer and other component is a non-cross-linked polymer [10, 11]; classification based on configuration (amorphous; semicrystalline: a complex mixture of amorphous and crystalline phases; crystalline) [1]; classification based on type of cross-linking (hydrogels can be divided into two categories based on the chemical or physical nature of the cross-link junctions) [1, 12]; classification based on physical appearance (hydrogels appearance as matrix, film, or microsphere depends on the technique of polymerization involved in the preparation process [1]; classification according to network electrical charge (nonionic; ionic; amphoteric; zwitterionic (polybetaines) containing both anionic and cationic groups in each structural repeating unit [1])}.

The use of hydrogels in oil production

The practical use of soft matter, which includes mobile structured media, including hydrogels, is of wide interest all over the world today. These polymer compounds, due to their rheological, thermophysical and physicochemical properties, are classified as smart (intellectual) materials. Hydrogels have already confirmed their high potential for use in bio- and regenerative medicine, pharmaceuticals, agriculture, oil production and other industries [13]. A characteristic feature of the current stage of development of the oil industry is a significant change in the structure of reserves towards an increase in hard-to-recover oils. This is due to the entry of a large number of deposits into the late stage of development [14, 15]. Currently, the efficiency of oil recovery by industrially applied methods at the late stage of oil field development around the world remains unsatisfactory. The average ultimate oil recovery for various countries and regions is approximately 25-40%. Thus, residual or non-recoverable reserves remain, on average, 60–75% of the initial geological oil reserves [16, 17]. In oil production, polymer injection is one of the most effective and cost-effective methods for enhanced oil recovery (EOR) of reservoirs. When water is injected into an oil-bearing layer, it follows the path of

least resistance (usually high permeability layers) towards lower pressure suction producing wells. If the oil in the field has a higher viscosity than the injected water, water will seep through such oil, resulting in low sweep efficiency, or bypassing the oil. Polymer injection can lead to a significant increase in oil recovery when compared to water injection. A typical polymer injection scenario involves mixing and pumping polymer over an extended period of time until approximately 1/3 to 1/2 of the reservoir pore volume is filled with polymer. Once such a polymer “piston” is formed, water is pumped for a long time in order to propel this polymer piston and the oil shaft ahead of it towards productive wells. In order to achieve the desired pore volume, the polymer is pumped continuously for several years [18, 19]. Polymer gels are an important material used for profile control, waterproofing, chemical flooding and hydraulic fracturing. Finally, the research potential of polymer gels in oil and gas drilling and production is proposed. The temperature resistance, salt resistance, gel strength and environmental friendliness of polymer gels need to be further improved to meet future oil and gas drilling and production specifications [20].

Before hydrogel formation, water displacement of oil occurs in the same way as in conventional waterflooding. At this stage, both of these methods have almost the same qualitative and quantitative difference from polymer flooding. This is due to the fact that a high-viscosity gel rim begins to form in the reservoir due to a chemical reaction with gel-forming reagents only after the injection of the solution of the first of them is completed and the injection of the second begins. Later, a highly viscous hydrogel barrier begins to form in the formation, in which the thickener concentration is determined by the amount of chemical reagents present at a given point in the porous medium. However, compared to the polymer rim, the mobile hydrogel region has a more vertical leading edge that extends over a greater formation thickness, like a bulldozer, this barrier pushes oil, and a zone of high oil content forms in front of it. Thus, in some cases, the method of creating movable hydrogel barriers is more efficient and cost-effective than conventional and polymer displacement methods [21]. The disadvantage of this method is that in the pore media of the formation, a

complete uniform distribution of the crosslinker with the polymer solution is not achieved for the necessary chemical reaction to occur along the crosslinking. It is known that for the implementation of a chemical reaction between the polymer and the crosslinker with the participation of the required volume of water, devices for mixing the components are used under certain laboratory and field conditions. Indeed, it is difficult to implement such an effect in reservoir conditions. Therefore, hydrogel according to the [21] method in porous reservoir conditions can only be obtained in the contact zone of separately injected components. Therefore, one should not expect special results from this method. The source also lacks quantitative data on the viscosity of the hydrogel, depending on the concentration of the polymer, crosslinker, as well as information on the durability of the hydrogel and other data. The development of high-viscosity oil (HVN) deposits in complex fractured-porous reservoirs requires the development and implementation of complex technologies that provide for the use, together with the thermal effect on the reservoir, of ways to limit water inflow, using high-viscosity gel-forming compositions, is an urgent task of modern oilfield chemistry [22]. In a very interesting and voluminous review article (2022) by forty Russian leading scientists-authors from eight authoritative organizations, the main nuances on the very topical topic "Polymers of the Future" [23] were deeply analyzed. It would be good in this article to see some well-known Russian scientists-authors in the field of oilfield chemistry available also on the topic "Polymers of the Future". In the direction of "Polymers of the Future" there are important results for the creation of high-strength hydrogels on nanocomposite bases as articular cartilage-like biomimetic compounds. It will be interesting to note the work of the famous Chinese scientist Jun Fu [24]. In this work, to create high-strength hydrogels, the author prefers multifunctional polymeric hydrophobic colloids as crosslinkers using nonionic surfactants (NSAs) of the OP-10 type; OP-7; OP-4 and block copolymers of ethylene oxides (PEO - polyethylene oxide) and propylene oxides (PPO - polypropylene oxide) with the conditional formula H-$(PEO)_{99}$-$(PPO)_{65}$-$(PEO)_{99}$-OH and the commercial name "Pluronik F-127" [24]. OP-10; OP-7; OP-4

are toxic compounds type alkylphenol derivatives. It is known that OP-4 is a representative of hydrophobic non-ionic surfactants, and OP-7 and OP-10 are hydrophilic non-ionic surfactants [25]. As for the block copolymers of alkylene oxides on the basis of certain non-colloidal surfactants (polyhydric alcohols, amines, phenol-formaldehyde resins, epoxy resins, etc.) [25-39], they are of particular interest as hydrophilic and hydrophobic micellar systems. The block copolymer of the H-$(PEO)_{99}$-$(PPO)_{65}$-$(PEO)_{99}$-OH type was not very well chosen by the author [24] as hydrophobic micelles. It would be good to study block copolymers with PPO side chains as hydrophobic micelles.

Conclusions on the literature review:

- China Research Institute of Oil Field Exploration and Development of SINOPEC Corporation is one of the world's leading companies in the field of polymer injection;
- No more relevant information was found in the Russian and English literature on the main points of the discovery formula:
- "nanophysics of reverse nanosuspensions of cross-linked hydrophilic polymers";
- "in the nanostructure of network cross-linked polymers";
- "on long-term self-protection of hydrogels from destructive processes";
- "property of long-term self-protection from destructive processes of hydrogels of equivalently cross-linked polymers capable of creating reverse nanosuspension";
- "nanostructured mesh cells of cross-linked hydrophilic polymers";
- "reverse nanosuspension at the same time has the properties of an ultra-resistant, high-viscosity mass with a rough (wavy) surface";
- "hydrogels of equivalently cross-linked hydrophilic polymers";
- "viscosity of hydrogels of equivalently cross-linked hydrophilic polymers";

- • “water clusters of the type of crystalline liquids” information only on liquid crystals;
- • "crystalline liquids" information only on liquid crystals;
- indeed, according to the above formula of the scientific discovery project, for the first time, the previously unknown property of the long-term self-protection of hydrogels from destructive processes is considered for the first time equivalently cross-linked hydrophilic polymers capable of creating a reverse nanosuspension due to absorbed bound water with various degrees of mineralization (0-400000 ppm) in the form of interconnected nanoheterogeneous associative colloidal water clusters such as crystalline liquids as a dispersed phase in nanostructured mesh cells of cross-linked polymers, as a dispersion medium, while the reverse nanosuspension acquires the properties of an ultra-resistant, high-viscosity mass with a rough (wavy) surface.

II. THE OBJECTS AND METHODS OF RESEARCH

The objects of research.

Were used as objects of study: various samples of water-soluble polymers; reservoir waters (without preliminary treatment) of the “Northern Buzachi”, “Kalamkas”, “Karazhanbasmunai”, “Uzen”, “Zhetybay” fields; water of the Caspian Sea, as well distilled water.

Information for the respective oilfields:

- **"Northern Buzachi" oilfield (**China **“SINOPEC” Corporation):**

Necessary information on the oilfield: since 1997 the deposit has been in operation; the annual volume of oil production is ~1.8 million tons; oil emulsion is resistant; oil viscosity at 40^{o}C 400-600 mPa·s; formation temperature 31^{o}C; oil density ρ=938-940 kg/m^3 (in terms of density it belongs to the type of "bituminous oil" [40]); water cut 92-99%; formation water salinity is 70,000 ppm [41]; sulfur 2%; paraffins ~1.5%; resins ~17.4%; asphaltenes ~5.6-5.8%; oil pour point -33^{o}C.

- **“Uzen” oilfield of “Ozenmunaigas” JSC:**

Necessary information on the oilfield: since 1965 the deposit has been in operation; the annual volume of oil production is ~5.5 million tons; oil emulsion resistant; oil viscosity at 40°C 30-40 mPa·s; formation temperature 57-68°C; oil density ρ=844-874 kg/m^3 (in terms of density, it belongs to the type "light oil" - "heavy oil" [40]); oil water cut averages 80-90%, and in some cases even reaches 98%; formation water salinity is up to 96000 ppm; paraffins ~25%; resins ~15%; asphaltenes ~3%; oil pour point 30-32°C [42, 43].

- **"Zhetybay" oilfield of "Mangistaumunaigas" JSC *(*50% of the China and 50% of the "NC "KazMunayGas")*:***

Necessary information on the oilfield: Since 1969, "Zhetybay" field has been in operation; the annual volume of oil production is ~2.75 million tons; oil emulsion is resistant; formation temperature not less than 70°C; oil density ρ=830-870 kg/m^3 (in terms of density, it belongs to the type "light oil" - "heavy oil" [40]*)*; water cut average 71.3%; formation water salinity is up to 161000 ppm [44]*;* paraffins up to 25-28%; resins ~15%; asphaltenes on average 3.4%; oil pour point 30°C [45, 46];

- **"Karazhanbasmunai" LLP oilfield ("NC "KazMunayGas" JSC-50% and CITIC Corporation Ltd of the China -50%):**

Necessary information on the field: Since 1974, the "Karazhanbasmunai" field has been in operation; the annual volume of oil production is ~2 million tons; oil emulsion resistant; reservoir temperature 26°C; ρ≈939-944 kq/m^3 (in terms of density it belongs to the type of "bituminous oil" [40]); water cut, up to 30%; formation water salinity is ~300000-400000 ppm [47]; sulfur up to 2%; paraffins 0.7-1.4%; resins up to 24%; asphaltenes, on average, 5.7%; viscosity 160-660 mPa·s).

- **"Kalamkas" oilfield of "Mangistaumunaigas" JSC.**

Necessary information on the field: since 1979, the Kalamkas field has been in operation; GOOD = ~3.6 million tons; oil emulsion resistant; formation temperature 30-43°C; ρ≈902-914 kq/m^3 (in terms of density, it belongs to the type of "bituminous oil" [40]); water cut, up to 89%; formation water salinity is ~121,000 ppm [47];

sulfur up to 0.3%; paraffins up to 5%; resins up to 23%; asphaltenes, on average, 5.9%; oil viscosity 238 mPa·s, at 40ºC [48]). Experience with polymer flooding in the Kalamkas field for the period 1980-2022 is set out in [49].

The methods of researchs.

Viscometry was the main research method. The method was carried out on a Chinese digital rotational viscometer of the NDJ-8S brand [50]. The digital display viscometer of the NDJ-8S type is a modernization of the company (Fig. 1). The device uses advanced mechanical design technology and microcomputer control technology, correct data acquisition. The display is set to blue backlight. The liquid crystal display has a high brightness. The device has a high measurement sensitivity. The test results are reliable, easy to operate, model beautifully and easily, other functions are used to measure the absolute viscosity of a Newtonian type fluid and the apparent viscosity of a non-Newtonian type fluid. The device is widely used in practice for measuring the dynamic viscosity of many liquids (oils; paints, plastics, gels, polymer solutions, drugs, jewelry, coatings, detergents, oil emulsions, commercial oils, viscoelastic systems, etc. liquids). Main technical parameters of the NDJ-8S viscometer:

Measuring range 1 - 2,000,000 mPa;

Rotor Specifications 1-4 rotors;

Rotor speed 0.3, 0.6, 1.5, 3, 6, 12, 30, 60 rpm;

The volume of liquid for measurement is 400 ml;

Measurement accuracy ±2% ;

AC power supply 220V;

Working environment temperature 5-35°C;

Relative humidity no more than 80%;

Form size 370 x 325 x 280 mm

Fig. 1. NDC-8S brand viscometer (measurement limit of the device is up to $2 \cdot 10^6$ mPa·s).

TDS meter TDS-3 is a device for measuring the total mineralization of water (Fig. 2) [51].

Fig.2. TDS-3 - a device for measuring the total mineralization of water

Description:

TDS meter - a device that is designed to measure the total number of particles (water salinity) dissolved in water (TDS - total dissolved solids) per one million water particles - ppm (parts per million), as well as water temperature. The device has an automatic temperature compensation function during measurement.

The TDS meter is used to control the level of salts and minerals, assess electrical conductivity, and also check the efficiency of cleaning filters. In order to determine the level of mineralization of water, it is enough to pour it into a glass, take a TDS meter, remove the protective cap, lower the electrodes into the water and take a measurement.

The principle of operation is based on the direct dependence of the electrical conductivity of the solution (current strength in a constant electric field created by the electrodes of the device) on the amount of compounds dissolved in water.

To measure the salinity of wastewater from the Northern Buzachi fields; "Uzen"; "Zhetybay"; "Karazhanbasmunai" and "Kalamkas" the original samples were diluted in 10; 10; 20; 50 and 15 times respectively. Hydrogels of cross-linked hydrophilic polymers with the corresponding recipes (Table 2) in volumes of 400 ml (water with various degrees of mineralization in the range of 0-400000 ppm) capable of creating a reverse nanosuspension are prepared in electric mixers with a rotation speed of 445 revolution / minute (Fig. 3). At the first stage, direct suspensions were obtained with 2-hour stirring. Then, 1% solutions of the crosslinker (in appropriate waters) are added in the mode of 10 minutes of stirring, spontaneous dispersion of the aqueous dispersion medium of direct suspensions in nanostructured mesh cells of crosslinked hydrophilic polymers occurs, as the dispersion medium of the created reverse nanosuspensions, i.e. there is a transition of suspensions from direct to reverse types. The degree of swelling was measured by the gravimetric method, according to the formula [52]:

$$\alpha = (m - m_o) / m_o$$

where, α is the degree of swelling of the gel sample under study, g/g; m is the mass of the swollen sample, g; m_o is the initial weight of the hydrogel sample, g.

For a qualitative and quantitative assessment of the degree of gelation and structure formation by viscosity values, we proposed a new classification [41]:

- 45-500 mPa·s weak gelling, weak self-organization;
- 501-1000 mPa·s moderate gelation; moderate self-organization;
- 1001-15000 mPa·s strong gelation, strong self-organization;
- 15,001-100,000 mPa·s powerful gelation, powerful self-organization;
- 100,001–300,000 mPa·s supergelation; super self-organization;
- >300,000 mPa·s hypergelation; hyper-self-organization.

Fig. 3. Preparation of hydrogels of cross-linked hydrophilic polymers

Information about hydrophilic polymers and crosslinkers that were used in the work are given in Table 1.

Table 1. Information about hydrophilic polymers and crosslinkers

Conventional designation of polymer	Polymer Composition	Molecular weight	Degree hydrolysis, %	Crosslinker	Optimum equivalent content of crosslinker relative to polymer, %
МПАА-20	Sulfonated PAA	$18 \cdot 10^6$	20	$CrCl_3$	3 (2.6-3.3)
ПАА-20	Polyacrylamide (PAA)	$18 \cdot 10^6$	20	$CrCl_3$	3 (2.6-3.3)
МПАА-10	Sulfonated PAA	$18 \cdot 10^6$	10	$CrCl_3$	3 (2.6-3.3)
ПАА-10	Polyacrylamide (PAA)	$18 \cdot 10^6$	10	$CrCl_3$	3 (2.6-3.3)

III. RESULTS AND THEIR DISCUSSION

The research results are shown in Table 2. According to Table 2, the following conclusions can be drawn:

1. In all research options at Crl=3% by weight of polymer (or in mass ratios P : Cb = 2000 : 60 = 33.3; P : Cb = 2500 :75 = 33.3; P : Cb = 3000 : 90 = 33.3; P : Cb = 3800 : 114 = 33.3; P : Sb = 4200 : 126 = 33.3; P : Sb = 5000 : 150 = 33.3; P : Sb = 3000 : 90 = 33.3), and also at Crl=2.6; 3.3% were achieved all elements of novelty in accordance with the formula of the alleged scientific discovery (section IV).

2. At Crl=5-10, excess amounts of crosslinker in relation to the equivalent average value Crl=3 function as of reverse suspension destructor with a transition to direct suspensions, as well as a destructor of the hydrophilic polymer itself as a result of the viscosity of the system approaches the viscosity of water;

3. For the first time, was established a previously unknown property of long-term self-protection of hydrogels from destructive processes for equivalently cross-linked hydrophilic polymers capable of creating a reverse nanosuspension.

4. Aqueous solutions of hydrophilic polymers are direct suspensions, and when crosslinkers are added, it has been established for the first time that there is a transition from direct suspensions to reverse suspensions (nanosuspensions), i.e. is descended spontaneous nanodispersion of an aqueous dispersion medium of direct suspensions in nanostructured mesh cells of cross-linked hydrophilic polymers as dispersion medium of the created reverse nanosuspensions.

5. A new hybrid state of water of the type of crystalline liquids (as a dispersed phase in nanostructured mesh cells of cross-linked hydrophilic polymers, as a dispersion medium for created reverse nanosuspensions) makes it possible to increase the viscosity of water 2,000,000 times and more, at a polymer concentration of 3000 (+90 ppm stapler); 3800 (+114 ppm crosslinker). High polymer concentrations are also highly effective, however concentrations of 3000 and 3800 are more cost effective.

6. Equivalent crosslinking of hydrophilic polymers is achieved at a mass ratio of polymer : crosslinker ≈ 33 : 1. For each polymer, the mass ratio polymer : crosslinker should be determined experimentally [14, 53-55].

7. For the first time, it was found that excess crosslinker residues have the properties of destructuring reverse nanosuspensions in direct suspensions, resulting in the loss of the unique properties of reverse nanosuspensions: long-term self-protection of hydrogels from destructive processes; crystalline liquids; superstability of the system; a high viscosity of hydrogel; the rough (wavy) surface of the hydrogel mass disappears; there is a strong syneresis of the hydrogel; a sharp decrease in the absorption capacity of hydrophilic polymers; if all this happens in reservoir conditions, there is no efficiency of polymer injection and, over time, an undesirable effect will be observed in production wells - polymer takeaway. Therefore, the property of long-term self-protection of hydrogels from destructive processes of equivalently cross-linked hydrophilic polymers capable of creating reverse nanosuspension is a very important priority in the field of application of polymers for enhanced oil recovery. Therefore, to prevent the above negatives, crosslinking should be carried out at equivalent ratios of polymer : crosslinker.

8. For the first time, the possibility of creating ultra-high-viscosity, stable nanoinverse emulsions with maximum contents of a dispersed water phase with various degrees of mineralization (distilled water; fresh water; formation waters of various oil fields) at the level of 99.61-99.8% has been established, the absorption capacity of the studied polymers is relatively to highly mineralized (70000- 400,000 ppm) waste waters is 263-500 g/g.

9. Aqueous solutions of hydrophilic polymers are direct suspensions, and with the addition of crosslinkers it has been established for the first time that there is a transition from direct suspensions to reverse suspensions (nanosuspensions) i.e. takes place spontaneous nanodispersion of an aqueous dispersion medium of direct suspensions in nanostructured mesh cells of cross-linked hydrophilic polymers as a dispersion medium of reverse nanosuspensions.

10. Hydrogels in the form of reverse nanosuspensions have the properties of an ultra-resistant, high-viscosity mass with a visually rough (wavy) surface (first identified by the authors of the discovery under consideration).

11. As a result of interesting joint work carried out by us with scientists and specialists of the Scientific Research Institute for Exploration and Development of Oil Fields of the “SINOPEC” Corporation (China, Beijing) in the field of polymer injection, it was found that, based on the results of rheological studies of hydrogels based on natural and artificial wastewater oil fields of the Republic of Kazakhstan, there are quite serious discrepancies.

12. Theoretically substantiated and experimentally confirmeda previously unknown the property about long-term self-protection from destructive processes of hydrogels of equivalently crosslinked hydrophilic polymers, capable of creating reverse nanosuspension at the expense to absorbed bound water with different degrees of mineralization in the form of interconnected nanoheterogeneous. associative of the colloidals water clusters, type crystalline liquids as a dispersed phase in nanostructured mesh cells of crosslinked polymers as a dispersion medium, the reverse nanosuspension at the same time acquires the properties of an ultra-resistant, high-viscosity mass with visually a rough (wavy) surface.

IV. SCIENTIFIC AND PRACTICAL SIGNIFICANCE OF A SUSPECTED SCIENTIFIC DISCOVERY

Area of Scientific Importance (ASI). ASI is determined on the basis of individual points of scientific novelty of the proposed discovery:

1. For the first time, a previously unknown property of the long-term self-protection of hydrogels from destructive processes (biodegradation; chemical destruction; biochemical destruction; physical destruction) of equivalently cross-linked hydrophilic polymers capable of creating a reverse nanosuspension. **ASI:** destruction of hydrogels; applied nanocolloidal chemistry; microbiology; nanophysics; engineering chemistry; engineering physics; application of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development.

2. Aqueous solutions of hydrophilic polymers are direct suspensions, and when crosslinkers are added, it has been established for the first time that there is a transition from direct suspensions to reverse suspensions (nanosuspensions), i.e. is descended spontaneous nanodispersion of an aqueous dispersion medium of direct suspensions in nanostructured mesh cells of cross-linked hydrophilic polymers as dispersion medium of the created reverse nanosuspensions. **ASI:** Applied Nanocolloidal Chemistry; engineering chemistry.

3. A new hybrid state of water of the type of the crystalline liquids [56] (as a dispersed phase in the nanostructured mesh cells of cross-linked hydrophilic polymers, as a dispersion medium for created reverse nanosuspensions) makes it possible to increase the viscosity of water by 2,000,000 times or more. **ASI:** nanomolecular physics; applied nanocolloidal chemistry; engineering chemistry; engineering physics; application of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development.

4. For the first time, it was found that excess crosslinker residues have the properties of a destructor of reverse nanosuspensions in direct suspensions, resulting in the loss of a complex of unique properties of reverse nanosuspensions set forth in the discovery formula. ASI: nanomolecular physics; applied nanocolloidal chemistry; engineering chemistry; application of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development.

5. For the first time, identified the possibility of creating long-term ultra-high-viscosity, stable nano-inverse emulsions with maximum contents of the dispersed water phase with different degrees of mineralization (distilled water; fresh water; formation waters of the various oil-fields) at the level of 99.61-99.75% has been established, and the absorption capacity of the studied polymers is 263-500 g/g. **ASI:** physical chemistry; applied nanocolloidal chemistry; engineering chemistry; application of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development.

6. Aqueous solutions of hydrophilic polymers are direct suspensions, and with the addition of crosslinkers it has been established for the first time that there is a transition from direct suspensions to reverse suspensions (nanosuspensions). **ASI:** Applied Nanocolloidal Chemistry; engineering chemistry;

7. Hydrogels in the form of reverse nanosuspensions have the properties of an ultra-resistant, high-viscosity mass with a visually rough (wavy) surface, which was first discovered. **ASI:** Applied Nanocolloidal Chemistry; nanophysics; nanomolecular physics; engineering chemistry; engineering physics;

8. According to the results of rheological studies of hydrogels based on natural and artificial (model) formation waters of oil fields of the Republic of Kazakhstan, there are quite serious discrepancies. **ASI:** engineering chemistry; application of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development.

Table 2. Values of dynamic viscosity) and of polymer (P)+crosslinker (Crl) compositions depending on P : Crl and the duration of the experiment under conditions of various polymers, waters and temperature

P : Crl, ppm		Crl, %	Dynamic viscosity (mPa·s) and desorbed water (%) of P+Crl compositions depending on, P : Crl and the duration of the experiment under conditions of various polymers and formation waters									
			2 day	7 day	15 day	1 month	3 month	0.5 y	1 year	2 year	4 y or≥	ST, st, μ
MPAA-20 : Crl (35°C)												
Produced water of the "Northern Buzachi" field (mineralization 70000 ppm)												
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
3000	300	10	3719	726	57	6	-	-	-	-	-	destruction
3000	150	5	4294	1509	216	22	-	-	-	-	-	destruction
3000	100	3.3	54362	41761	95 782	490648	903460	~$2\cdot10^6$	~$2\cdot10^6$	1493552	1156053	reverce hst hvis
3000	**90**	**3**	**78469**	**128286**	**144780**	**1753805**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**~$2\cdot10^6$**	**~$2\cdot10^6$**	reverce hst hvis
3000	80	2.7	66170	103944	127247	704189	1425671	>$2\cdot10^6$	>$2\cdot10^6$	~$2\cdot10^6$	~$2\cdot10^6$	reverce hst hvis
3000	45	1.5	16453	33752	29483	23977	21640	-	-	-	-	reverce[2]
3000	0	0	64	69	67	72	49	-	-	-	-	direct
PAA-20 : Crl (35°C) Produced water of the "Northern Buzachi" field (mineralization 70000 ppm) (35°C)												
3800	380	10	2951	894	149	8	-	-	-	-	-	destruction
3800	190	5	5961	2105	419	250	9	-	-	-	-	destruction
3800	150	3.9	42509	110546	291816	241352	285457	321786	306353	107660	83104	reverce[1]
3800	125	3.3	69371	259634	431695	915738	1174830	1684299	1928526	>$2\cdot10^6$	>$2\cdot10^6$	reverce hst hvis
3800	**114**	**3**	**77 592**	**331637**	**865094**	**1693707**	**1309844**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	reverce hst hvis
3800	100	2.6	72167	290408	761353	1363719	1446833	1928635	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	reverce hst hvis
3800	57	1.5	19714	35170	31526	36137	33692	34058	-	-	-	reverce[2]
3800	0	0	204	86	81	82	61	40	-	-	-	direct
MPAA-20 : Crl (35°C) Produced water of the "Northern Buzachi" field (mineralization 70000 ppm)												
3800	380	10	5478	1178	280	17	4	-	-	-	-	destruction
3800	190	5	9609	2950	993	504	27	-	-	-	-	destruction
3800	150	3.9	81547	251055	914248	836027	698490	820265	577682	123065	105727	reverce[1]
3800	125	3.3	83285	649175	1309933	1503912	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	reverce hst hvis
3800	**114**	**3**	**1135925**	**729603**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	**>$2\cdot10^6$**	reverce hst hvis
3800	100	2.6	105037	717519	1625442	>$2\cdot10^6$	~$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	>$2\cdot10^6$	reverce hst hvis
3800	57	1.5	25242	53942	47099	61903	55194	53829	-	-	-	reverce[2]

3800	0	0	279	90	94	93	67	46	-	-	-	direct
PAA-20 : Crl (43ºC) Produced water of the “Kalamkas” field (mineralization 121000 ppm)												
3800	380	10	2478	803	152	5	-	-	-	-	-	destruction
3800	190	5	4580	1474	293	46	4	-	-	-	-	destruction
3800	150	3.9	34681	71947	195834	211529	207273	215568	212391	79910	52942	reverce[1]
3800	125	3.3	41795	149026	307861	726904	990472	1157523	1583296	1275043	1594128	reverce hst hvis
3800	**114**	**3**	**45394**	**160915**	**541833**	**1058566**	**1269320**	**1791353**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	100	2.6	43530	154369	472918	983317	1153927	1521045	1842784	>2·10⁶	>2·10⁶	reverce hst hvis
3800	57	1.5	16425	29926	28051	31839	31454	32032	-	-	-	reverce[2]
3800	0	0	190	81	75	76	58	40	-	-	-	direct
PAA-20 : Crl (43ºC) Produced water of the “Kalamkas” field (mineralization 121000 ppm)												
3800	380	10	3754	963	179	11	-	-	-	-	-	destruction
3800	190	5	7089	2360	614	311	38	-	-	-	-	destruction
3800	150	3.9	57492	186513	397486	543616	588391	402684	391360	106047	93528	reverce[1]
3800	125	3.3	83671	423540	791452	1201739	1498723	1813386	~2·10⁶	>2·10⁶	>2·10⁶	reverce hst hvis
3800	**114**	**3**	**869049**	**431578**	**975817**	**1640251**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	100	2.6	85730	427905	854036	1459625	1763417	~2·10⁶	>2·10⁶	>2·10⁶	>2·10⁶	reverce hst hvis
3800	57	1.5	22909	49178	44740	45072	43985	43483	-	-	-	reverce[2]
3800	0	0	250	88	89	90	63	45	-	-	-	direct
PAA-20 : Crl (26ºC) Produced water of the “Karazhanbasmunai” field (mineralization 300000-400000 ppm)												
3800	380	10	4736	891	190	12	-	-	-	-	-	destruction
3800	190	5	6038	2870	769	274	13	-	-	-	-	destruction
3800	150	3.9	45721	118533	204216	318940	254671	251944	157829			reverce[1]
3800	125	3.3	78635	421591	789544	950381	1139840	1207856	1493567	1665340	1366849	reverce hst hvis
3800	**114**	**3**	**94591**	**493748**	**826494**	**1459530**	**1376945**	**1513762**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	100	2.6	91732	450587	805299	1209547	1339706	1455073	1880154	>2·10⁶	>2·10⁶	reverce hst hvis
3800	57	1.5	20695	37280	35908	38152	40915	40324	-	-	-	reverce[2]
3800	0	0	217	74	70	71	55	-	-	-	-	direct
MPAA-20 : Crl (26ºC) Produced water of the “Karazhanbasmunai” field (mineralization 300000-400 000 ppm)												
3800	380	10	5159	1092	234	16	5	-	-	-	-	destruction
3800	190	5	8590	2719	873	365	18	-	-	-	-	destruction
3800	150	3.9	75689	213632	439715	426019	297946	196830	150377	86513	73166	reverce[1]
3800	125	3.3	81763	609616	1389577	1663304	1489271	1864865	~2·10⁶	>2·10⁶	1746933	reverce hst hvis
3800	**114**	**3**	**104297**	**685418**	**1516951**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	100	2.6	101934	659275	1509342	1938516	1839047	>2·10⁶	>2·10⁶	>2·10⁶	>2·10⁶	reverce hst hvis
3800	57	1.5	23795	44196	40613	49598	47615	48826	-	-	-	reverce[2]
3800	0	0	285	88	83	76	60	43	-	-	-	direct
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
MPAA-10 : Crl (80ºC) Produced water of the “Zhetybai” field (mineralization 161000 ppm)												
3800	380	10	1451	518	95	8	-	-	-	-	-	destruction
3800	190	5	6740	2095	484	188	29	-	-	-	-	destruction
3800	150	3.9	15862	48168	180890	351895	294961	249563	193658	157409	90277	reverce[1]
3800	125	3.3	23791	81670	350837	654781	693432	905342	1143757	1059543	981160	reverce hst hvis
3800	**114**	**3**	**27947**	**84253**	**379246**	**921642**	**832804**	**1185915**	**1486930**	**1637533**	**1292694**	reverce hst hvis
3800	100	2.6	26189	84042	380198	809325	820813	1106439	1442934	1378620	1286493	reverce hst hvis
3800	57	1.5	9432	17639	15943	16509	17384	17839	-	-	-	reverce[2]
3800	0	0	198	81	75	68	54	36	-	-	-	direct
MPAA-10 : Crl (68ºC) Produced water of the “Uzen” field (mineralization 96000 ppm)												
3800	380	10	1851	739	104	14	7	-	-	-	-	destruction
3800	190	5	7084	2950	577	296	41	12	-	-	-	destruction
3800	150	3.9	24275	58169	248920	448396	401583	299361	219846	178503	118544	reverce[1]
3800	125	3.3	26794	92730	497835	741923	901478	1104393	1286802	1297354	1196820	reverce hst hvis
3800	**114**	**3**	**35385**	**98608**	**539281**	**992430**	**1172797**	**1349636**	**~2·10⁶**	**1846348**	**1507917**	reverce hst hvis
3800	100	2.6	32209	96970	545113	875743	1098464	1157201	1740582	1675945	1384208	reverce hst hvis
3800	57	1.5	14892	20381	18957	22497	23674	23079	-	-	-	reverce[2]
3800	0	0	227	92	77	70	58	35	-	-	-	direct
Some experiments with MPAA-20 : Crl (35ºC) Produced water of the “Northern Buzachi” field (mineralization 70000 ppm)												
4200	**126**	**3**	**789846**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
5000	**150**	**3**	**1299446**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
Some experiments with MPAA-20 distilled water (mineralization ~0 ppm) (35ºC)												
2000	**60**	**3**	**485340**	**1451282**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	**114**	**3**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
5000	**150**	**3**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
Some experiments with MPAA-20 water of the Caspian Sea (mineralization ~12 900 ppm) (35ºC)												
2500	**75**	**3**	**310809**	**801843**	**1295376**	**1539680**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
3800	**114**	**3**	**1409370**	**~2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis
5000	**150**	**3**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	**>2·10⁶**	reverce hst hvis

Explanation of some abbreviations according to table 2: P : Crl = polymer (P) : crosslinker (Crl); hst - high stability; hvis - high viscosity; reverse[1] - values of the viscosity of reverse suspensions at Crl = 3.9, there is an excess of the crosslinker,

which acts as a partial destructor of the corresponding gel, resulting in a sharp decrease in viscosity for all options; reverse[2] - viscosity values of reverse suspensions at Crl = 1.5, there are options with insufficient amounts of crosslinker by about 2 times compared to equivalent options, resulting in a sharp decrease in viscosity for all options; MPAA-20 modified polyacrylamide with a degree of hydrolysis of approximately 20%, heat resistance of the corresponding gel up to 80°C; MPAA-10 modified polyacrylamide with a degree of hydrolysis of about 10%, heat resistance of the corresponding gel up to 80-100°C; PAA-20 polyacrylamide with a degree of hydrolysis of approximately 20%, heat resistance of the corresponding gel up to 80°C; PAA-10 polyacrylamide with a degree of hydrolysis of about 10%, heat resistance of the corresponding gel up to 80-100°C; 1 ppm = 1 mg / l = 1 mg / dm^3.

Thus, based on the individual points of scientific novelty of the considered project of discovery, possible priority areas of scientific importance have been identified: the use of tertiary methods for extracting residual oils from oil-bearing formations at the late stages of field development; nanophysics; applied nanocolloidal chemistry; physical chemistry; microbiology; engineering chemistry; engineering physics, etc.

Area of practical importance of scientific discovery: oilfield nanochemistry and nanophysics for enhanced oil recovery. In accordance with the conditions of the presence of medium-large channels, low efficiency of water injection, great difficulty with clogging of channels in the injection wells of the Northern Buzachi field, a study and implementation of an injectivity profile alignment technology (IPA) based on a gel-polymer composition with delayed gelation and particles with preliminary stitching. The injection of working solutions was carried out in stages, which made it possible to effectively plug medium-large channels and obtain a positive processing result. In 2018, this technology based on this discovery was applied at the 4 injection wells, and all of them showed positive results, resulting in a net additional cumulative total oil production of 6135 tons. The actual economic efficiency due to additional oil

production is 2.24 million US dollars. Thus, the project of scientific discovery proposed by us under the name "Property of long-term self-protection of hydrogels from destructive processes of equivalently cross-linked hydrophilic polymers capable of creating a reverse nanosuspension" has found its practical confirmation in the field of oilfield nanotechnology based on nanocolloid chemistry and nanophysics. The successful application of this nanotechnology has provided a new technical solution aimed at stabilizing oil production and increasing the efficiency of operating oil fields at a late stage of development. Positive results of the implementation allow expanding the application of this scientific discovery to the Northern Buzachi field, to other fields of the Buzachi Peninsula, as well as to other regions of the Republic of Kazakhstan. This discovery is also of interest in medicine and cosmetics for the manufacture of ointment preparations based on reverse nanosuspensions.

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Other professional sciences

MODERN RECEPTIONS OF «GREEN» STANDARD FOR FITNESS CENTERS

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Abstract. *The sports industry is gaining more and more importance in the life of modern society and of every person in particular. As a result of the study of the prevalence of sports facilities in Ukraine, it was found that fitness clubs have the largest share of the market in cities. This is due to popularization of fitness at the highest level and stimulation of Ukrainians to a healthy lifestyle.*

Modern fitness in Ukraine has developed over the past 10-15 years. People began to think about the importance of training for human health, about the benefits of a healthy lifestyle and the consequences of lack of physical exercise. Today, all the cities of our country have a variety of specialized fitness centers and clubs which provide various complexes of fitness programs.

The design of fitness centers requires certain requirements. Today, there is no document that fully meets the modern requirements for designing a fitness facility. In the current DBN V.2.2-13-2003 "Sports and physical culture and health facilities" determine only the issue of the location of sports facilities, the distribution of functional zones and technical support. It is impossible to design clubs according to one pattern. Thoughtful and professionally implemented interior of the club - ensures its success, gives uniqueness and makes it competitive.

The topic of introducing modern eco-design methods in the interiors of fitness clubs is relevant. The problem is that the use of living plants in the interior design of sports facilities is quite limited in Ukraine. The implementation of greening in the practice of designing and building fitness centers will improve the environmental friendliness of buildings, the level of comfort of stay, and improve the architecture of buildings. Phytodesign is becoming a modern and popular method of interior landscaping - the introduction of plants into interior design, taking into account their biological, ecological and aesthetic features. Phytocompositions are used for decorating and visual zoning of spaces, creating an aesthetically attractive atmosphere.

Keywords: *fitness center, landscaping, microclimate, green architecture*, design.

Relevance of research. The topic of introducing modern eco-design methods in the interiors of fitness clubs is relevant. The problem is that the use of living plants in the interior design of sports facilities is limited in Ukraine. The implementation of landscaping in the practice of designing and building fitness centers will improve the environmental friendliness of buildings, the level of comfort, and improve the architecture of buildings.

Today, meeting the requirements of "green" standards is a priority direction in the development of the typology of fitness centers with a developed functional composition and planning organization. The principles of "green" construction or eco-architecture will contribute to the energy-efficient use of resources, the satisfaction of the principles of sustainable development, the modern development of the city's architecture, and will also involve cultural ways of spending leisure time and improving the health of the nation.

Scientific novelty. Using the example of a fitness center project in Odesa (Ukraine), the use of plants for greening sports facilities was analyzed; determining

the optimal architectural and planning and compositional methods of phytodesign of the interior of the premises.

The task of high-quality design of fitness centers requires studying the centuries-old theoretical and practical history of the construction of sports facilities [1].

Analysis of design experience and prerequisites for the formation of sports complexes

For the competent design of sports buildings and complexes, a comprehensive analysis of the history of the formation and development of sports facilities and an assessment of their role in the social life of mankind is necessary. The study of the main trends of international sports architecture at various stages of its formation is an important requirement when designing modern sports facilities [1].

Sports have accompanied the life of human society since ancient times. Physical culture and sport have their historical roots dating back to ancient times. The history of sports facilities consists of the following periods: *primitive-communal, slave-owning, the Middle Ages, and modern times.* Archaeological excavations provide information about primitive structures for physical exercises that date back to the Stone Age. The petroglyphs testify that already the cave people organized competitions in the open air to pass tests [2].

Sports buildings in Ancient Greece and Rome. In ancient times, physical exercises had a cult character and were associated with hygiene, military training, games, and entertainment. The development of physical education necessitated the construction of special facilities. The spirit of good neighborliness and peaceful competition is reflected in the architectural design of stadiums in Ancient Greece. Greek stadiums differed in perfect architectural forms, grand scale and harmoniously fit into the surrounding landscape (Fig. 1). There were several types of buildings: gymnasium - a rectangular building with a special playground for walks and exercises:; the stadium - a rectangular building was located between the hills; hippodrome - had the shape of a horseshoe with tracks covered with sand.

The buildings of Ancient Rome were designed for gladiatorial combat and were multi-storied, circular structures with a fighting arena in the center, such as the Colosseum. The stadiums of this period become architecturally finished objects. Their form had a significant impact on the construction of modern sports arenas.

Fig. 1. Sports facilities of Ancient Greece and Ancient Rome

The Middle Ages. The early Middle Ages is characterized by a complete decline of physical culture. Sports facilities were not built because the church was opposed to physical exercises (Fig. 2).

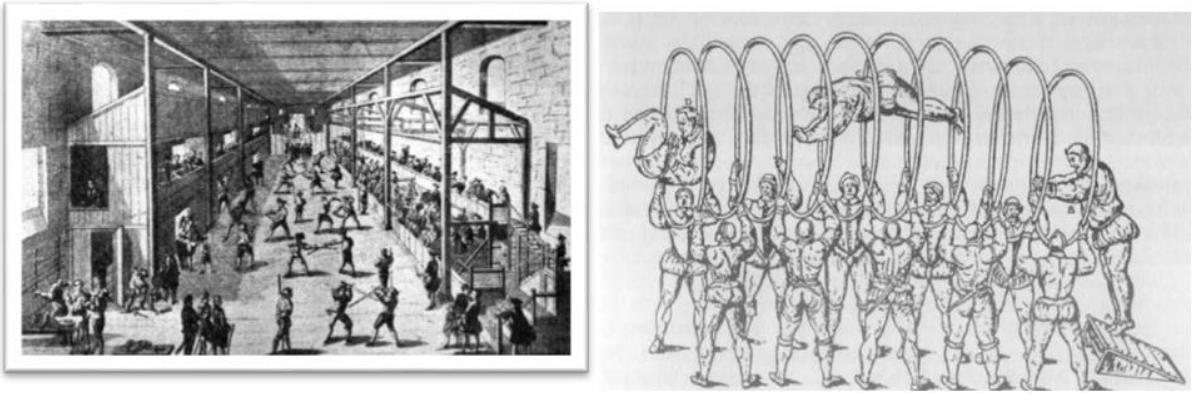

Fig. 2. Sports games in the Middle Ages

Only feudal lords participated in knightly tournaments. In the 16th and 17th centuries. in many cities, special areas were set aside for public ball games and target shooting. The Middle Ages became famous for sports games. The period of the late

Middle Ages - the birth of bourgeois physical culture gradually saw the revival of the role of sports facilities .

From modern times to the present day. Starting from the 19th century, the role of sports facilities began to gradually revive. Fans of German, French, and Swedish gymnastics began to build small sports grounds (Fig. 3).

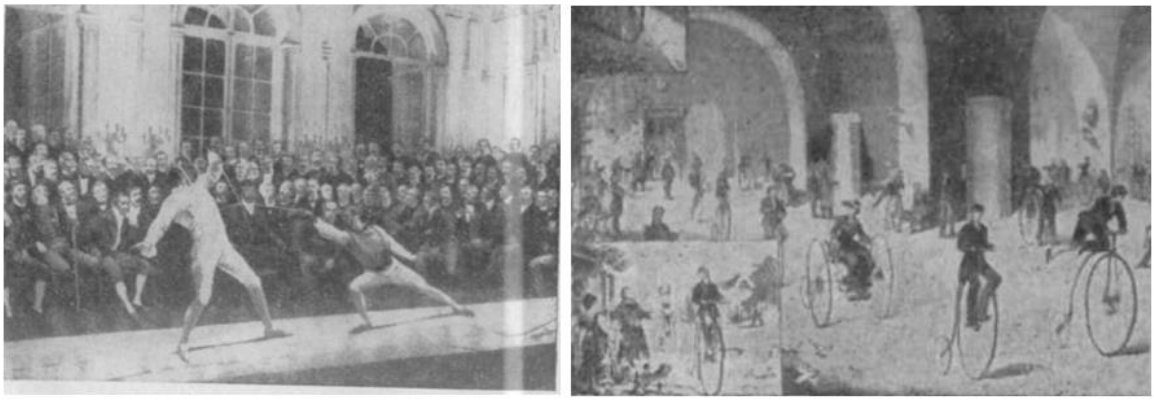

Fig. 3. Sports grounds of the New Age

The era of modern sports began with the protection of human health from the impact of industrialization: swimming pools (Germany, 1828; Holland, 1830); football pitches (1855). In the 20th century under the influence of technical progress and socio-political reforms, all types of sports began to develop intensively. This required the construction of special sports facilities of various types and designs. The appearance of new materials in construction led to changes in the architecture of sports facilities. In terms of functionality, modern sports facilities have mostly preserved common features with ancient buildings (Fig. 4).

Fig. 4. Modern stadium architecture

Features of the organization of fitness centers

In recent decades, the attitude of citizens towards sports and a healthy lifestyle has been changing in a positive direction. The number of people engaged in fitness has increased significantly.

The requirements for the design and construction of sports facilities are changing. More attention is paid to the application of ecological and innovative solutions and meeting the requirements of the modern consumer. The analysis of advanced international experience in the design of fitness objects showed that there are the following features of their organization: a developed composition of functional zones; additional accompanying service; use of the adjacent territory; compliance with "green" standards. In the architectural and planning decisions of fitness facilities, the following are distinguished: main functional areas; additional multifunctional zones; auxiliary, public, commercial and service. The main architectural and planning principles of the organization of fitness centers: *the principle of accessibility, the principle of social targeting; principle of functionality; the principle of transformation; principle of ergonomics; the principle of natural integration; principle of manufacturability; the principle of environmental safety* [3].

One of the main requirements for the design of modern fitness centers is the principle of environmental safety, which takes into account microclimatic and sanitary and hygienic requirements for the parameters of the premises. A fitness club is a space for physical activity. He should be charged with energy and cheerfulness. Therefore, the quality of the air in the halls of the fitness center is of particular importance. During training, people's oxygen consumption increases, a person begins to breathe through the mouth, bypassing the body's natural filter - the nose, which reduces immunity and increases the risk of infection. In the process of training, a person's heartbeat accelerates, which leads to increased breathing. Accelerated breathing helps to increase the content of carbon dioxide in the air, and accordingly, the amount of oxygen during inhalation decreases. This causes a feeling of suffocation, rapid fatigue and reduces the effectiveness of training. Numerous

scientific studies have shown that high levels of dust, carbon dioxide, formaldehyde and other volatile organic compounds are established in sports halls. Concentrations of these substances mostly exceed indoor air quality standards (Fig. 5) [4].

Fig. 5. Premises of fitness centers

Another problem of the environment of sports facilities is mold and fungus, which is formed due to high humidity. They destroy sports equipment and have a serious detrimental effect on human health. Developing in the pool, showers and changing rooms, fungal colonies harm the reputation of the institution, but most importantly harm human health. Closed windows, stagnant air, accumulation of carbon dioxide exhaled by a person, dust on interior surfaces and walls all lead to deterioration of air quality. Air in a closed space can be several times more toxic and dangerous than outside.

Sanitary and hygienic requirements for sports halls

Sports facilities must meet certain hygienic requirements that provide optimal conditions for people engaged in physical culture and sports. These requirements are regulated by relevant building and sanitary norms and rules, industry regulatory and methodical documents. Particularly high hygienic requirements are applied to sports facilities, since the health-improving effect of physical exercises and sports depends on their sanitary condition [5].

The air-heat regime of sports facilities is subject to hygienic regulation, as it significantly affects the heat exchange of people. Optimal humidity - 30-50%, air

movement - 0.06-0.25 m/s, temperature 15-17 °C. A special sanitary and hygienic regime is established for artificial indoor swimming pools: air temperature + 24 ° - + 27 ° C, water temperature - from + 26 ° to + 29 ° C. Water quality must meet the requirements for drinking water.

To ensure the necessary air exchange, it is planned to install central supply and exhaust ventilation. A properly designed gym ventilation system is crucial, as ventilation ensures the correct balance of gases and ensures that the air you breathe does not contain too much carbon dioxide. The ventilation of the fitness center should be sufficient. Each of the visitors must receive the necessary amount of oxygen. From a medical point of view, the influx of fresh air is necessary for "feeding" muscle tissue and facilitating their work, as well as for sufficient blood supply to the parts of the body that are being trained.

Properly designed pool ventilation normalizes the level of moisture content in the air, ensures the absence of condensation and excess moisture, reduces the likelihood of mold and fungus in the room to almost zero.

The role of ecodesign in forming the microclimate of fitness clubs

Modern architects use phytodesign to create a favorable, comfortable and safe environment in the premises of fitness clubs. Plants are an important addition to the air conditioning system. Plants and green areas are an additional source of fresh air. Their use in the premises allows to increase the quality and cleanliness of the air; will provide an optimal combination of gases in the air environment; will make the air safer to breathe.

Plants in the halls remove odors and pollution from the environment, provide humidity control; contribute to the improvement of the microclimate and sanitary and hygienic conditions of the environment. Plants reduce stress and have a positive psycho-emotional effect. Green color has a calming effect, reduces irritability, improves mood. Plants reduce the negative impact of electromagnetic waves, leveling the internal background [6].

The use of green plants for sports centers is focused not only on the aesthetic appeal of the project being created, but also on its practical validity (Fig. 6). The practical goals of filling indoor spaces with greenery include a number of advantages: reducing the need for air conditioning and saving electricity; air humidification; green leaves produce oxygen [7].

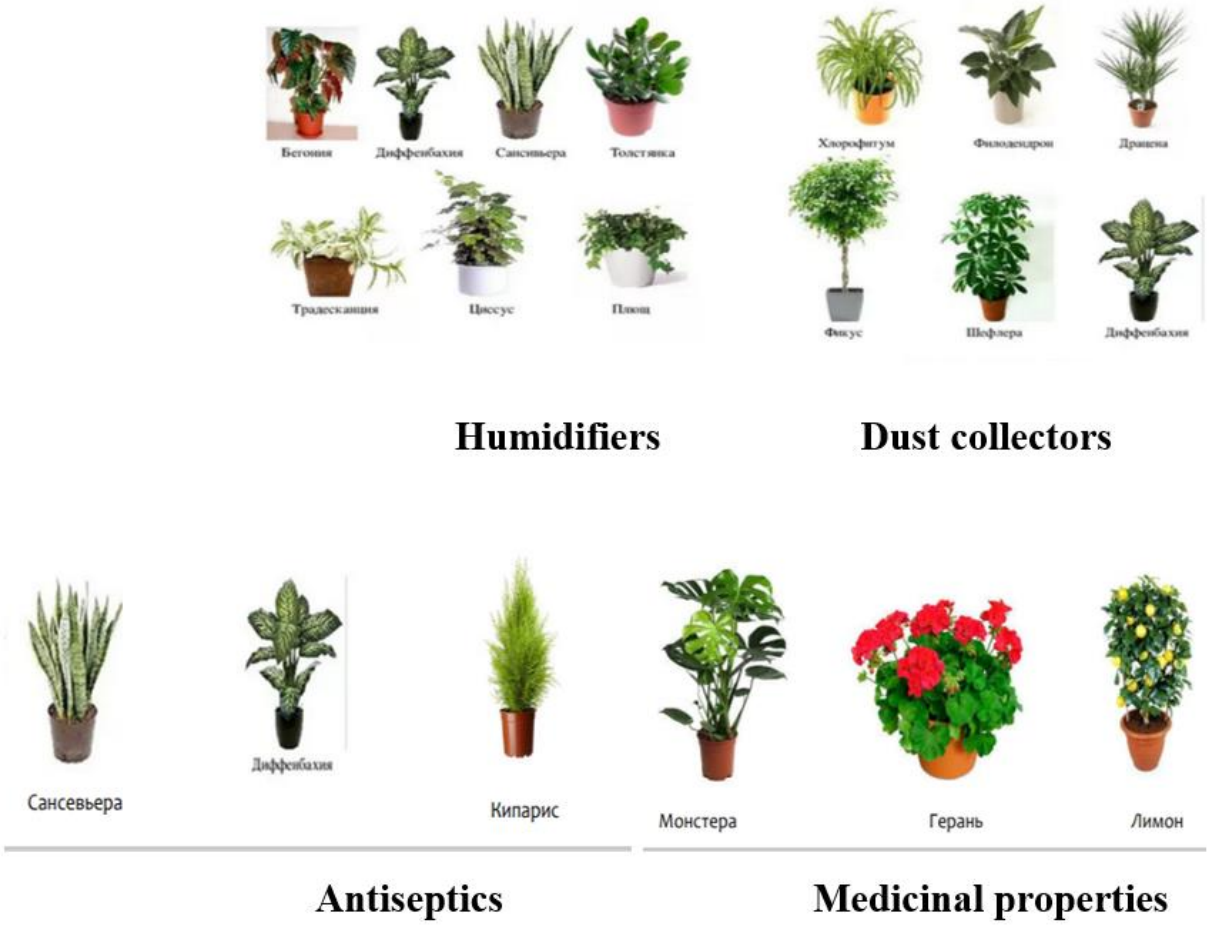

Fig. 6. Properties of plants

The use of green plants and the basic techniques of phytodesign in the formation of the interior space of sports centers solves a number of tasks: aesthetic - the mental effect of plants on a person with the help of the beauty of form and color; improvement of the air environment (tonic, soothing smells); disinfection and improvement of the environment due to volatile phytoncides; air purification from gases, dust, smoke; noise reduction by plants; bioindication, i.e. the use of plants as living indicators of air, soil and water pollution; study of the condition of the plants

themselves in the interiors in order to select the most effective and well-growing species [8].

There are certain landscaping methods for the premises of fitness centers. The analysis of the best international experience in the design of fitness facilities showed that a great deal of attention is paid in the projects to the application of ecological and innovative solutions that meet the requirements of green construction. Phytodesign of the interior and greening of fitness centers is a very relevant trend in world eco-architecture (Fig. 7).

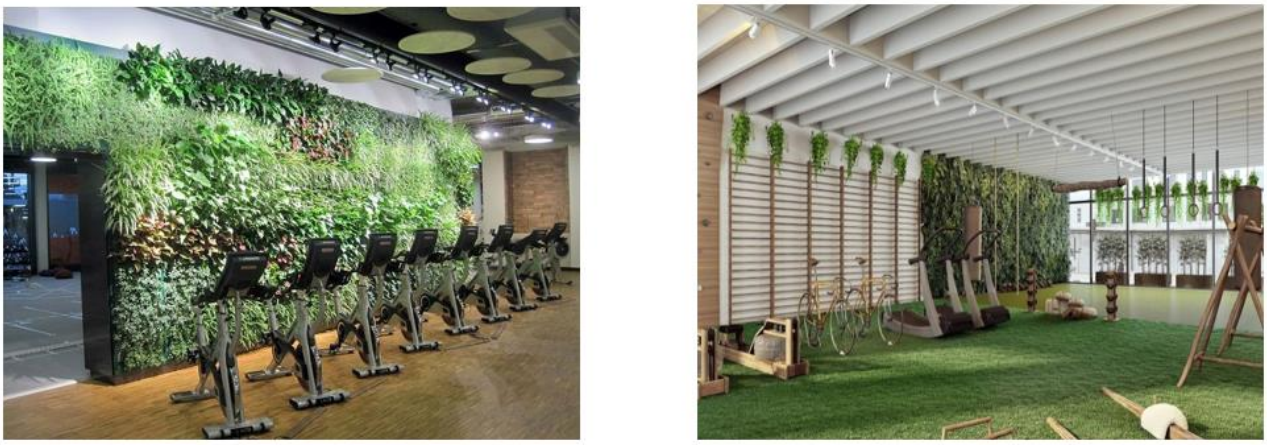

Fig.7. Foreign experience in phytodesign of gym interiors

However, many popular fitness centers in Ukraine do not take this into account (Fig. 8). A review of fitness centers in Ukraine showed that in most cases, phytodesign has not become widespread.

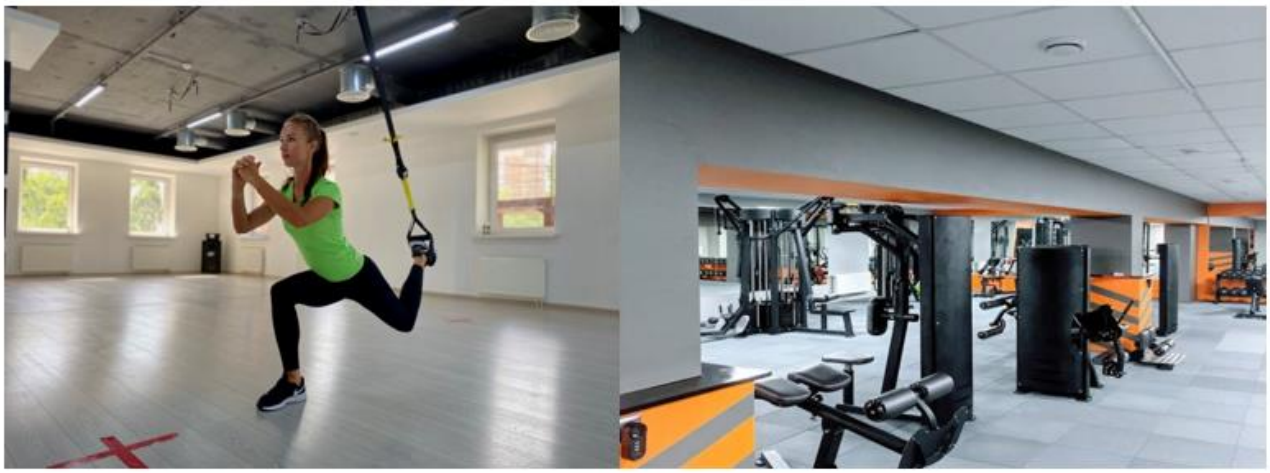

Fig. 8. Fitness halls, Ukraine (Kyiv, Odesa)

Current trends in phytodesign include *vertical gardening; use of phytomodules and panels; living mono- and polystenes; zoning of space with designer compositions, portable and stationary phytopanels; decorating individual rooms with phytopaintings; scaling, zoning and organization of recreational areas* [9].

Currently, there are many currents and trends in interior landscaping with living and stabilized plants. As a method of eco-architecture, vertical landscaping, phytopaintings and fresh flowers standing in vases and pots are widely used in the interiors of fitness clubs. Such phytodesign always beautifies the room, provides coziness, creates a pleasant atmosphere and increases the artistic quality of decorative decoration. Vertical landscaping directly forms the interior of the room, enriches the architectural expressiveness of its interior space, improves its functional organization, performs aesthetic and utilitarian functions. A "living" wall is a structure with various plants that are mounted on the wall, and when using it, the issues of physical and aesthetic connection of plants and their care are solved. In addition to the aesthetic "living" wall, it can perform a protective function thanks to the improvement of the microclimate, ionization, cleaning, humidification, and enrichment of the air with oxygen. It provides regulation of the thermal regime, prevention of excessive heating of the walls, protection against noise, rain, wind, and dust (Fig. 9).

Fig. 9. Stabilized moss

According to the rules of phytodesign, the distribution of individual colors or groups of plants in interiors can be very diverse. At the same time, plant compositions should not conflict with the environment. It is very important to consider the size and purpose of the room when choosing and placing colors for landscaping. Therefore, large specimens are placed in the space of the room, small ones - in small rooms. In large halls, not overloaded with furniture, halls, it is better to put large tall plants with large leaves.

The humid air of gyms, locker rooms and swimming pools is a breeding ground for the growth of mold, bacteria, fungi and viruses, which is why a musty smell appears. Developing in the pool, showers and changing rooms, fungal colonies harm health and destroy sports equipment. The technical solution to the above problems is a properly designed ventilation system and the use of green plants.

Landscaping of indoor swimming pools of fitness centers has become a find for interior design (Fig. 10).

Fig. 10. Phytodisan of indoor pools

In the pool, you can use modern decor from plants. This is an opportunity to create a unique microclimate, a sense of comfort. When creating such a phytodesign, not only the harmony of the composition is taken into account, but also the ability of plants to survive in conditions of increased temperature, humidity and artificial lighting. Particular attention is paid to the selection of pots, which will also be exposed to the influence of a humid climate. A closed pool has its own characteristics, therefore unpretentious plants are used for landscaping the territory:

decorative palm trees; ficuses; decorative ivy; spathiphyllums; ferns, etc. Pots, planters and containers for plants are selected so that they are combined with plants and the general design of the indoor pool [10].

OBJECT, SUBJECT AND RESEARCH METHODS

Research object: fitness center project located in Odessa (Ukraine).

The purpose of the study: to develop internal landscaping of the premises of the fitness center as a way to improve air quality and microclimate.

The subject of the study: Identifying the peculiarities of the organization of fitness centers, taking into account sanitary and hygienic requirements for sports facilities.

Objectives of the study:

1. Conduct an analysis of the history of the formation and development of sports facilities;

2. Analyze the architectural and planning structure and experience in designing sports facilities;

3. Identify the factors affecting the air quality of gyms and fitness centers, and consider the sanitary and hygienic requirements for the microclimate;

4. To analyze the current state of phytodesign of interiors of fitness centers in foreign and domestic practice;

6. Identify relevant design solutions that can be used for landscaping the fitness center in the Odesa project.

Research methods. Use of a system approach in solving tasks. General scientific methods are applied in the research - study of literary sources, theoretical analysis, comparison, systematization, generalization of theoretical observations on modern directions of green architecture.

RESULTS

The construction of the fitness center is planned on the site located near the recreation area of Odesa, Ukraine (Fig. 11). The building is the compositional center of the entire territory. The project of the fitness center building was developed in accordance with the DBN of Ukraine. The topography of the territory is calm, the climate is moderate. The average annual temperature is +10.7 ° C, the average annual precipitation is 425 mm. North and south-west winds prevail in winter, north-west and north in summer. Thus, climatic factors are favorable for designing a fitness center in this area. Climatic factors are favorable for the facility in this area

The spatial and planning solutions of the building include a gym, premises for group and individual classes, a swimming pool, sports fields and a tennis court. From the characteristics of the architectural and spatial organization of interiors, the dimensions of the room - its useful area, depth, height, area set aside for plants - serve as criteria for their landscaping; from the characteristics of the microclimate - the parameters of comfortable conditions for humans.

Fig. 11. The building of the fintes center

The project used modern methods of landscaping the interior spaces. As you know, the plants in the room decorate not only improve the appearance, but also improve the air quality. Plants emit more than 300 volatile substances that have a healing effect on the human body. Taking into account the sanitary and hygienic requirements, ornamental leafy plants, as well as undemanding and non-smelling crops were used in the project for the fitness center.

When creating the decorative decoration of the premises with the help of plants, the project used modern methods of vertical landscaping - phytowalls and panel paintings (phytopaintings). These new popular trends in phytodesign are most often used to save space. Phytopaintings are aesthetic and spectacular and have a positive visual and psychoemotional impact on visitors. This use of landscaping creates a concentration of living green mass, which contributes to the release of more oxygen. Plants provide freshness, humidification and cooling of the air, which is extremely important for the gym. All together helps the air conditioning system clean the air more efficiently. At the same time, the vertical landscaping of these premises provides additional noise insulation. Greening of columns and walls allows you to create accents in the interior, give the space more light and warmth.

In the premises of the fitness center (halls, corridors, lobby), a combination of vertical green compositions with single flowers is designed (Fig. 12). For the foyer, they chose to create a phytocomposition with a central part and more low-growing plants on the edges. Large and tall plants are placed on the floor or on a stand. At the same time, it was taken into account that flowers should not stand where they are easily damaged, for example, in narrow passages, in drafts, close to batteries, heaters and air conditioners.

The pool hall was not overloaded with a large number of green plants, vertical greening of the walls was used (Fig. 13). Individual plants in tubs or on the floor were not used because they can clutter the interior, block lighting and create inconvenience in movement, which do not correspond to the intended purpose of the

room. The coach's room also featured vertical landscaping and fresh flowers in vases placed on shelves.

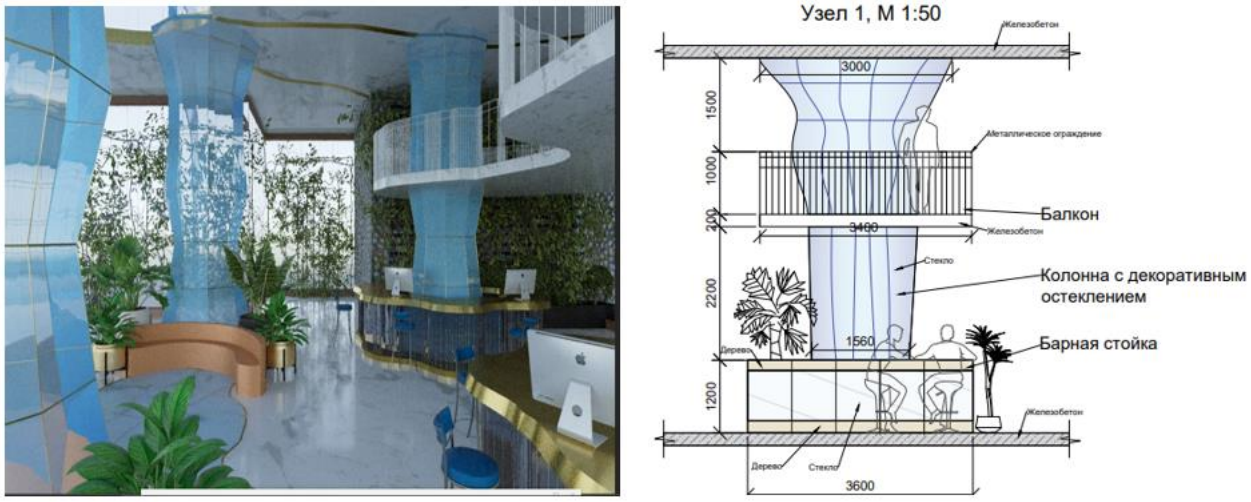

Fig. 12. Phytodesign of the foyer

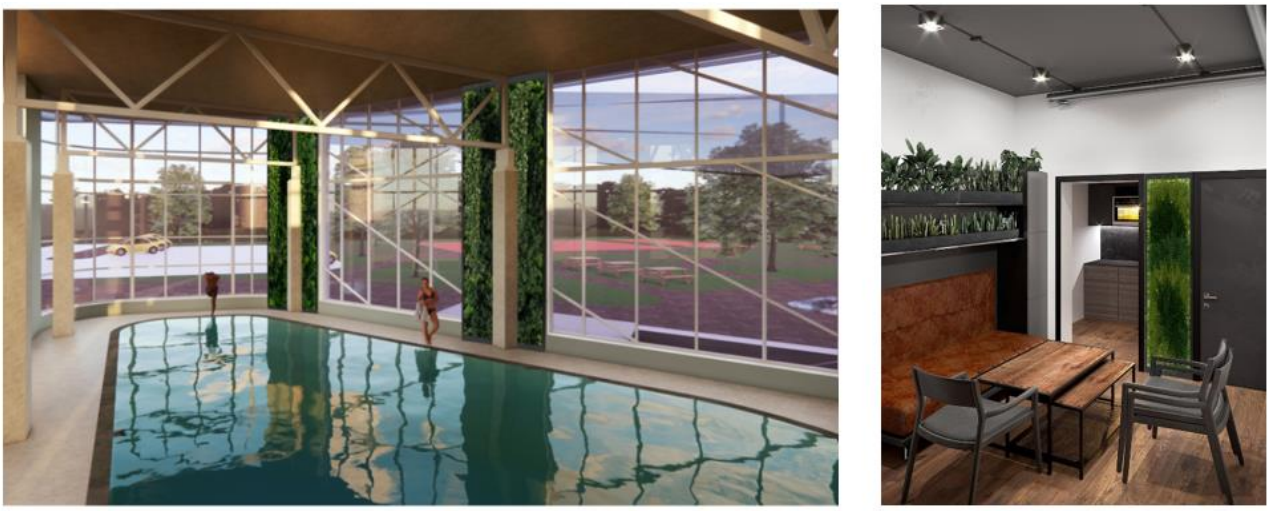

Fig. 13. Eco-design of the swimming pool and training room

The lack of space in training halls limits the use of many techniques of phytodesign. Landscaping in training halls should not interfere with training in the first place (Fig. 14). From a practical point of view, it is impractical to fill the space with a large number of single living plants. They interfere with the performance of exercises, require considerable means and care. Therefore, phytowalls and panel paintings (phytopaintings) were used in the training halls.

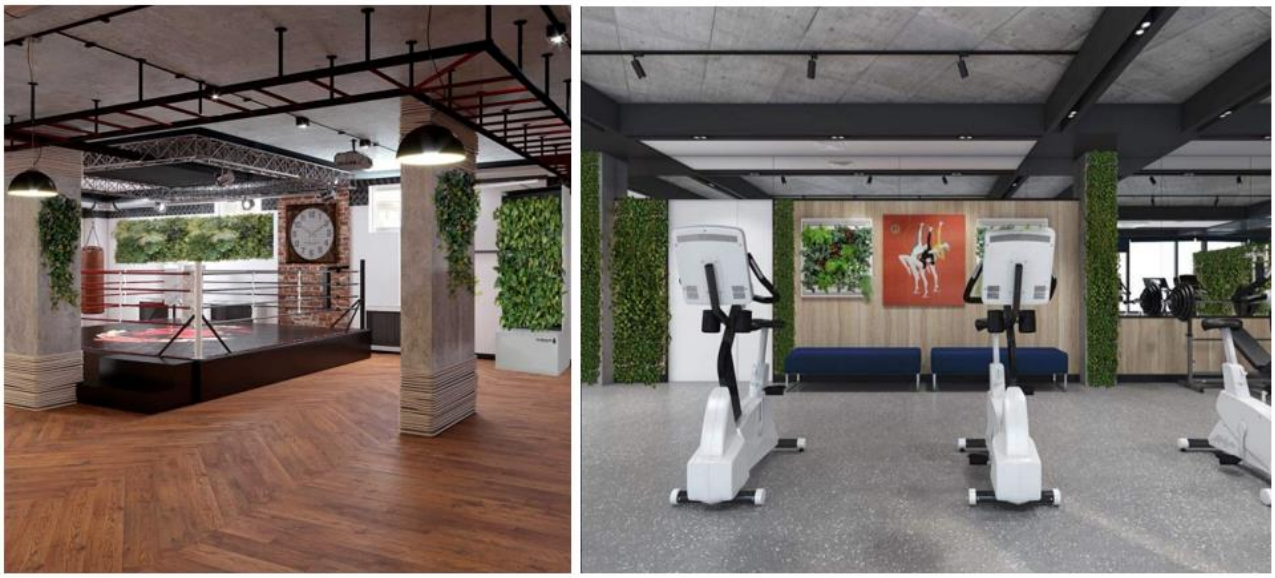

Fig. 14. Phytodesign of training halls

In the premises of the cafe, vertical greening of the walls was mainly used to create a micro-landscape suitable for this premises (Fig. 15). Individual plants in tubs or on the floor can clutter the interior of the cafe, block the lighting, create inconvenience in movement that do not correspond to the intended purpose of the room.

Fig. 15. Phytodesign cafe

Rest areas are provided for full relaxation and rest (Fig. 16). Taking into account the ratio of the size of the flower composition and the size of the room, it is proposed to arrange a small winter garden on the roof.

Fig. 16. Zone for repair

For the zone, curly growths were planted in the adjoining vicor. In order to visually visualize the zone of repair, creating a whole composition, greenery is placed behind the armchairs, symmetrically along the sides.

CONCLUSIONS

1. Among sports facilities in Ukraine, fitness clubs have the largest market share in cities. This is due to popularization of fitness at the highest level and stimulation of Ukrainians to a healthy lifestyle.

2. A high level of dust, carbon dioxide, formaldehyde and other volatile organic compounds is established in sports halls. Concentrations of these substances mostly exceed indoor air quality standards.

3. One of the main requirements for the design of modern fitness centers is the principle of environmental safety, which takes into account microclimatic and sanitary and hygienic requirements for the parameters of the premises.

4. The analysis of the international experience of designing fitness facilities showed that great attention is paid in the projects to the application of ecological and innovative solutions that meet the requirements of green construction.

5. An actual and promising direction in the architecture of sports facilities is the use of interior landscaping. Phytodesign of the internal space of sports centers solves a number of tasks: aesthetic - mental impact of plants on a person;

improvement of the air environment; disinfection and improvement of the environment due to volatile phytoncides; air purification from gases, dust, smoke; noise reduction.

6. The fitness center project (Odesa) used modern methods of interior landscaping - vertical landscaping, phyto-paintings and fresh flowers in vases.

7. The introduction of phytodesign will increase the environmental friendliness of the building, the comfort level of the stay, and the aesthetic architecture of the building.

8. The proposed architectural-planning solution will improve the microclimate and sanitary-hygienic characteristics of the indoor environment, as well as ensure the environmental compliance of the project with the requirements of green certification.

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Economic sciences

SIGNIFICANCE AND FUNCTION OF FINANCIAL MANAGEMENT FOR DETERMINING BUSINESS RESULTS OF TOURISM AND HOSPITALITY COMPANIES

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Abstract. *The term "leadership" comes from the Latin origin of the word "tanus" translated as "hand". The term "management" comes from an English word that is rooted in the French-English word "menage" which means "management" or "management". Management is a discipline that deals with researching problems, managing affairs, as well as controlling personnel. The importance of management lies in the need to ensure the efficiency of the company's functioning. Without management, resources would be wasted. The basic task of management in tourism and hotel industry is to plan the desired future of the hotel company and to realize that plan to the maximum extent. The financial analysis of the company's operations is of crucial importance when making a series of business decisions, and it is based on financial reports. The financial reports provide a functionally and time-rounded set of business processes in the company. The key external users are investors and creditors, actually stakeholders who provide capital.*

When it comes to reporting for the needs of external users, International Accounting Standards must be applied, while in reports for the needs of internal users, that is, managers who make business decisions, different analyzes can be performed in accordance with internal needs. Therefore, financial management deals

with the management of business finances and consists of five functions (financial planning, financial organization, selection of financial personnel, financial management, as well as financial control) Personal finance refers to financial planning and control of personal financial flows of cash inflows and outflows. As for business finances, they refer to the concept of financial management in the company. At the end of creating and presenting financial reports, financial management creates management decisions within the company based on the report. Accounting and formation forms the basis of management for making final business decisions. The management and accountants of the company's organization are primarily responsible for the accuracy and reliability of the data, i.e. information presented on the basis of prepared financial and other reports.

Management therefore has an obligation to report to stakeholders on the success of the organization's operations. Managers take over tasks from the owners of the organization with the aim of achieving the appropriate effect. The audit of financial statements includes checking (balance sheet, income statement, cash flows, changes in capital and notes. The audit is performed by a certified accountant who checks the accuracy of financial statements. Making human resource plans is actually anticipating the need for personnel and matching the individual with the organization. Quality personnel may be rejected and poor quality personnel may be received. According to the reception of new employees, the management must pay attention to the orientation, ie the transformation of the newly hired into an efficient individual, which can be determined by measuring the performance and analyzing his abilities, as well as the behavior of the employees during work activities. Labor force retention is achieved by providing satisfactory personal income, benefits, benefits, and the like.

Keywords: *financial management, personnel management, management functions, financial indicators, financial managers, accountant auditor*

1. INTRODUCTION

The term "leadership" is of Latin origin "tanus" translated as "hand". In the twentieth century, a new term came into use, the English word "management". The word "management" itself comes from the English word "management", which is rooted in the French-English word "ménage", which in its original meaning has the meaning of being a capable staff, doing something, managing something, and is best translated as "management" or "management". Management is a special scientific discipline, of a multidisciplinary character, which deals with researching the problems of managing jobs, enterprises and social systems. The concept of management is also defined as a process by which purposeful organizations are created, directed, maintained and operated through coordinated, cooperative human effort. From the aspect of management in tourism and hoteliers, a definition that is sufficiently comprehensive and adapted to the requirements of the modern environment. Management means the process of working with the help and cooperation of other people, in order to effectively achieve organizational goals, with the efficient use of limited resources in the conditions of a changing environment.

The importance of management lies in the need to ensure the efficiency of the company's functioning. Without management, resources and energy would be wasted. From year to year, the need for management grows, and therefore there is a tendency to increase the number of people involved in management tasks. Business conditions in the modern tourist market present exceptional challenges for managers, and at the same time have led to a situation where the importance of this activity has never been greater. Successful managers change the world, influence the creation of new products and services, and support the personal development of the people who work for them. The essence of management in tourism and hotel industry is actually human relations, i.e. efficient management of processes and people. The basic importance of management derives from these relationships because it represents a process of conscious and constant improvement, where we understand the intention or goal as its basic element. the fact that in the US every year around 100,000 companies fail.

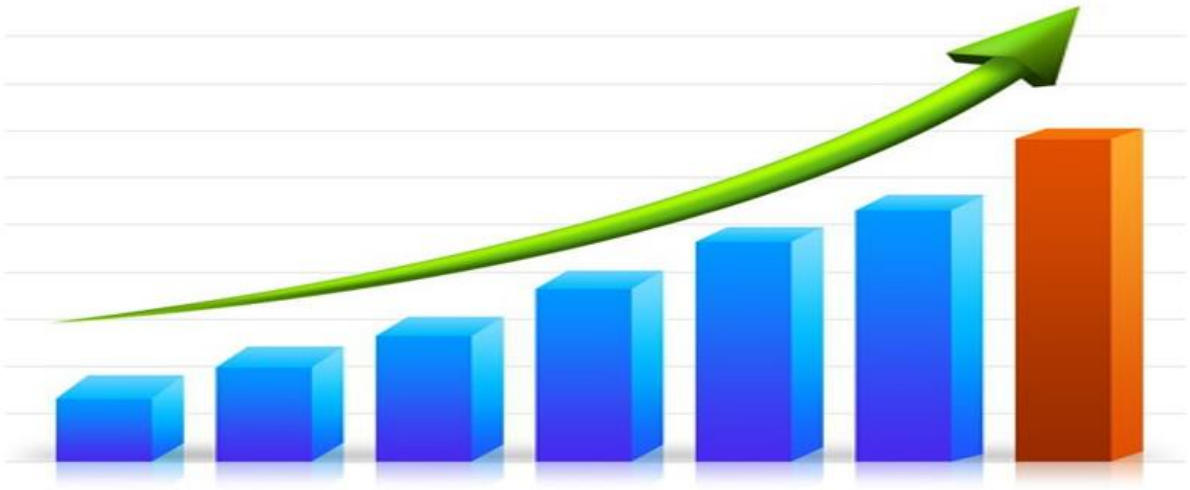

Fig. 1. Presentation of the growth rate of profit in the company

Source: https://puntomarinero.com/images/financial-performance-of-the-company_4.jpg

In Great Britain, that figure is slightly lower, but still large, around 30,000. The main reason for their failure lies in ineffective management. The basic task, even the need, of management in tourism and hospitality is to plan the desired future of the hotel company and to realize that plan to the maximum extent possible. The basic task, even the need, of management in tourism and hospitality is to plan the desired future of the hotel company and to realize that plan to the maximum extent possible. In order to translate various ideas into actions, managers must be ready to support, encourage and motivate workers who need to implement planned plans and decisions. In the late 1950s, due to rapid economic growth and rapid technological changes, financial institutions such as pension funds and insurance organizations experienced a great rise.

Therefore, the manager's responsibility towards:

1. salaries to employees,

2. to creditors and shareholders,

3. state taxes,

4. billing providers.

Managers are interested in the success of the company because it provides them with higher salaries, and also because they are often shareholders. There was a need to use scientific methods in making financial decisions and a modern approach to financial management was developed. In contrast to the traditional approach, the modern approach to financial management is based on rapid economic growth and technological changes, which caused the importance of the manager's responsibility for the success of the company to grow tremendously.

In addition to the problem of capital acquisition, he also deals with the assets and liabilities of the balance sheet. The main goal of financial management at the state level is to strengthen the system of social relations- so that the layers of society are not in an illegal state. Therefore, when making financial decisions, you should: *evaluate their consequences, try to reduce the costs of their implementation, etc.* The main financial goal of the company is profit maximization. For shareholders, the main goal is to maximize their assets. This is achieved by increasing the market value of shares.

2. THE SIGNIFICANCE AND ROLE OF FINANCIAL MANAGEMENT FOR THE BUSINESS OF TOURISM AND HOSPITALITY COMPANIES

Management is the science and art of managing people. Financial management is the study of all matters related to monetary problems, money creation, flows, investments, consumption, a multitude of complex actions in the economy, and profit flows in general. Financial managers must not only learn how to make money, but also how to save it. You can earn more income through finance than in any other field of production or service. They show how to work less and earn more. Financial management is an excellent opportunity in the modern business world. In today's world, far more is spent on finance than on trade transactions. The fact that ignorance of finances can ruin any company must also be taken into account, so care must be taken to ensure that the finances of an entity are entrusted to a correct financial

manager. Financial management is the management of financial affairs of a business entity (companies, organizations, institutions) [1].

In the theory of finance, different terms are used for economic entities such as:

1. financial management,

2. business finance,

3. microfinance,

4. corporate finance,

5. financial management.

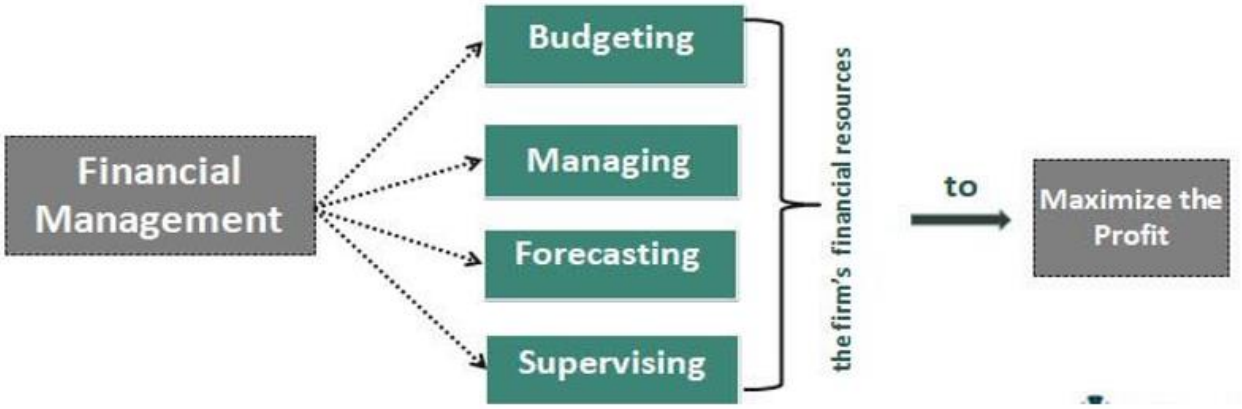

Fig. 2. Financial management

Source: https://cdn.wallstreetmojo.com/wp-content/uploads/2022/06/Fianancial-Management.jpg

The most common term used by today's financial managers in tourism and hotel companies is "financial management". [2] Business finance in the hotel and tourism industry primarily studies tasks such as: [3]

1) financial functions,

2) liquidity and solvency,

3) sources/forms of financing,

4) management of business finances,

5) business policy,

6) planning,

7) organization,

8) management or records,

9) control, analysis and information,

10) cash flow planning,

11) working capital analysis,

12) securities or instruments of value,

13) financial assessments of investment and financial decisions,

14) analysis of working capital and the like.

The main goal of business finance management is to stimulate the financial capital of the business entity at the maximum rate of return on investment, which is also the central motive of financial management. Creating a policy of optimal financial placements while dynamically maintaining the optimal degree of liquidity of economic entities is the goal of managing business finances. [4] The next important goal for companies dealing with hotels and tourism is profit maximization, i.e.gain. Therefore, this goal is directly related to the profitability of the investment, because the demand for profit maximization implies equally the demand for maximizing the yield for capital investors, that is, the demand for more effective and efficient use of assets.

Along with this goal is the goal of maximizing the profitability of the business, which is achieved through maximizing the value of the investment investment. Maximizing share prices of business entities is one, but not the most important, goal that is used very often in practice.

Fig. 3. Functions of financial management

Source: https://d1m75rqqgidzqn.cloudfront.net/wp-data/2021/11/08152056/financial-management-functions-1024x576.jpg

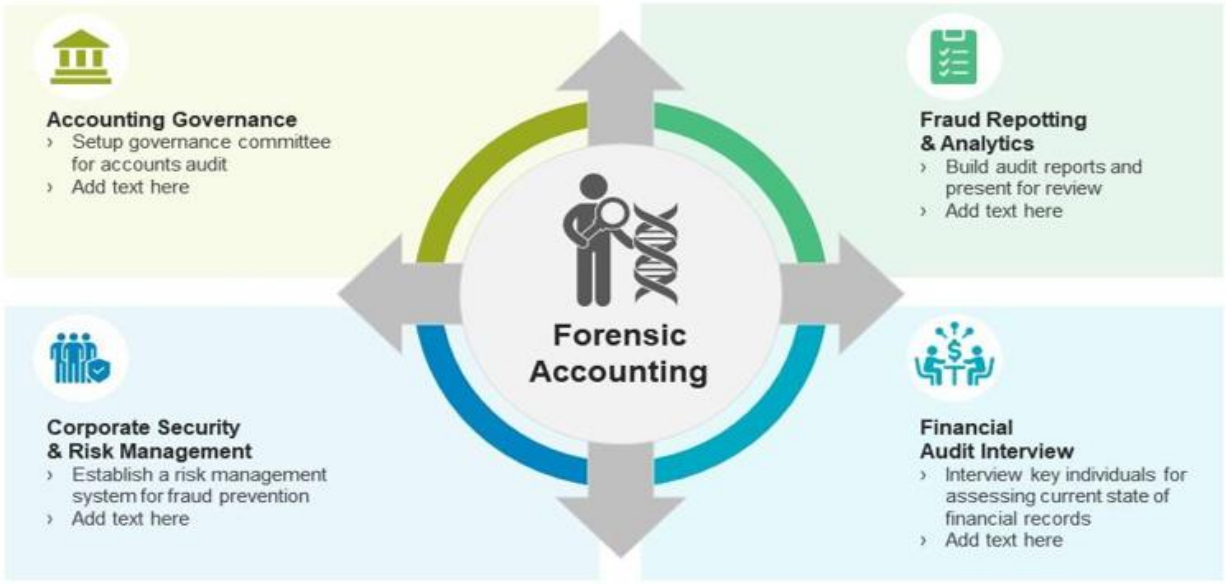

Fig. 4. Essential Elements of Forensic Accounting in Business

Source:https://www.slideteam.net/media/catalog/product/cache/1280x720/e/s/essential_elements_of_forensic_accounting_in_business_slide01.jpg

There are three practical reasons for this, which are:

1. investors follow the values of share prices and make investment decisions based on that,

2. share prices are visibly present on the stock exchange and are publicly traded.

3. share price is the basic measure of profit for shareholders, because they can be sold and cashed.

Financial management has a special place in the management system, because finance is closely related to management, technology, resources, personnel, etc. Mistakes in financial management can lead to negative consequences in these areas; on the other hand, the sources of financial problems are often found precisely in these areas. In our country, as well as in other countries in transition, financial management is just gaining real importance, while in countries with a market economy, it has long since become an important scientific discipline and practical activity.Deficiencies in the planning process make it necessary for managers to react spontaneously to changes in business, without adequate preparation to deal with those changes in a conscious way. By planning, the company's activities are conceived in such a way that they lead in the direction of achieving its goals. Planning decisions, therefore, must be made in advance, and they refer to the jobs that need to be done, then to when those jobs should be done, as well as to who should do the given jobs. Managers also use plans as business standards, which are necessary for them to control the company's operations, by comparing what happened with what should have happened. [5]

3. MANAGEMENT OF FINANCIAL PERSONNEL IN TOURISM AND HOSPITALITY

People with their professional qualifications and role in the business process represent the personnel base of companies and other organizational systems. That is

why human resource management, in theory and in practice, is also called personnel management.

Fig. 5. Human Resource Management

Source:https://community.nasscom.in/sites/default/files/media/images/HRM.jpeg

This term includes human resource management activities and managers who perform these activities. At the same time, human resources management activities represent the personnel policy, which is carried out by top managers, as well as managers of business units and functions, with the help of the personnel department headed by the appropriate manager. The basic role of personnel management is to harmonize the number and structure of human resources with the planned scope and structure of the company's operations. It represents the backbone of achieving the strategic goals of the company as a whole and its business units.

On the other hand, operational management is responsible for the following activities:

1. determining the need for workers,

2. their training and development,

3. evaluation of the work,

4. rewards,

5. protection at work,

6. replacement of workers who left the company.

Human resources management or personnel management takes place on two basic hierarchical levels. In this sense, as is the case with management in general, it differs:

1. strategic management of human resources, i

2. operational management of human resources.

Strategic management of human resources is based on the general strategy of the company and on the strategy of its business units and functions. In this process, the human resources function of the company, whose bearer is the human resources department, plays an important role. The activities of the personnel function are manifested in the assessment of personnel needs and opportunities of the company, as well as tendencies in the development of education, and in the study of people's behavior in the work process.

Based on the knowledge gained in this way, the personnel department helps the company's management in choosing strategic solutions for human resources management.

The role of the personnel department in this sense is manifested in helping management in the process of conceiving and implementing the strategy: [6]

1. inventions,

2. 2 choice,

3. deployment,

4. rewards and

5. personnel promotion.

This role of the personnel department is based on a thorough analysis of the tasks performed in the process of the company's functioning. Such analysis includes:

1. job description,

2. grouping of jobs,

3. evaluation of jobs.

Fig. 6. Strategic Human Resource Management

Source: https://www.hrmexam.com/wp-content/uploads/2020/01/1-1.jpg

On the basis of job descriptions, information is obtained about workers and their responsibilities, as well as the role of those jobs in the functioning of the company. In this way, knowledge is obtained about the type and level of qualification of workers required for given jobs. The grouping or specification of jobs aims to provide information about the necessary knowledge, skills and abilities of workers to perform certain jobs. In this way, it is possible to carry out the specialization of workers, which contributes to the increase of labor productivity. The evaluation of jobs serves as a basis for evaluating and ranking jobs, so that awards and salaries of workers can be determined more objectively.

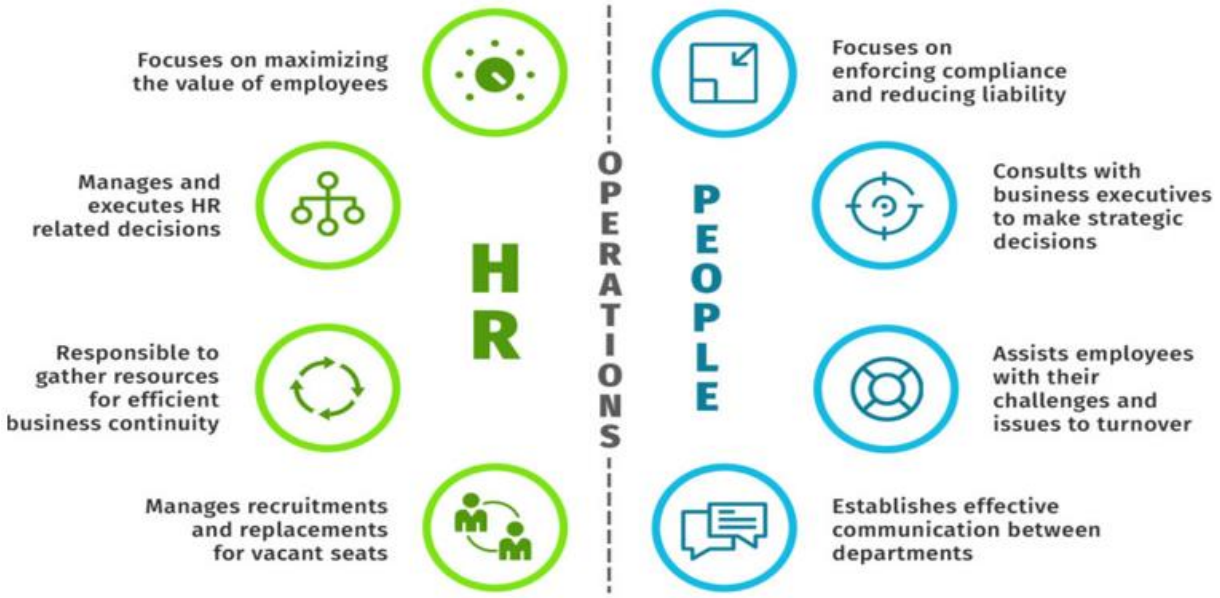

Fig. 7. Operations Human Resource Management

Source:https://hr.university/wp-content/uploads/2022/05/Difference-between-HR-Operations-and-People-Operations-1024x660.jpg

Operational management of human resources includes the development of strategic personnel plans. In this sense, operational managers:

1. determine the personnel needs plan and require the personnel department to find suitable employees,

2. carry out on-the-job training,

3. decide on salaries and other rewards of workers,

4. evaluate and rank workers in order to measure the mutual relationship in height

5. salary,

6. are responsible for the implementation of occupational safety and health protection measures for workers,

7. are responsible for the implementation of contracts with trade unions,

8. undertake measures to fill vacant positions,

9. perform the final selection of new employees.

Considering the specificity of the role of man as a thinking and creative element of the production process, the management of human resources is conditioned by the relationships that prevail in the social environment. In this sense, operational management, in conducting personnel affairs, must take into account the legal regulations in the field of labor relations, then the trade union organization of workers, as well as other workers' rights. That is why it is necessary for operational managers to familiarize themselves in detail with their legal obligations, as well as with other obligations towards society, before making decisions and taking actions in the process of hiring, assigning and rewarding workers in their organizational segment of the company [6].

Therefore, people are the most reliable resource at the disposal of an institution, human resources are the factors on which everything in every organization depends. The efficiency of functioning, as well as the economy of every organization, depends on the treatment and management of human resources. Despite the fact that the management emphasizes the importance of people in success, it is evident that there are still great reserves, especially in the practical relationship to the organization in which people live and work. Human resource planning is about predicting the need for people and matching the individual with the organization. Workforce selection is a critical stage in providing the organization with quality people.

In it, high-quality ones can be rejected and low-quality ones can be received. Upon admission, the management must focus special attention on turning the newly hired into an efficient individual, which is determined by measuring the performance and analyzing his abilities, as well as his behavior. Labor force retention is achieved by providing satisfactory personal income, benefits, benefits, etc. All the listed elements directly affect the productivity of work in the organization, thereby improving the overall economy of organizational systems. [7]

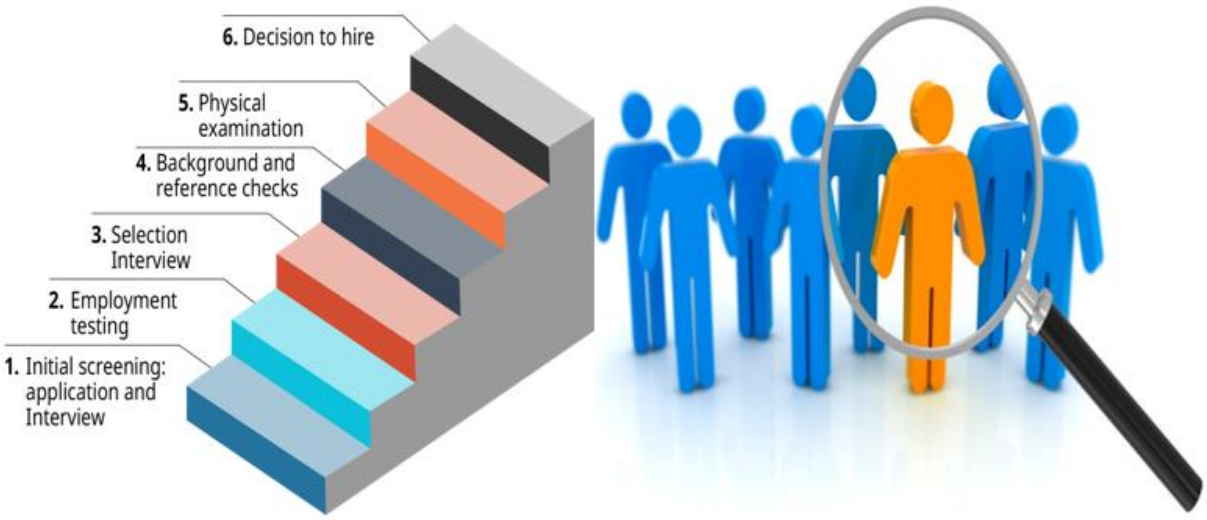

Fig. 8. Employee Selection

Source: https://s3-us-west-2.amazonaws.com/courses-images/wpcontent/uploads/sites/.jpg

4. ANALYSIS AND PERFORMANCE INDICATORS OF THE FINANCIAL MANAGEMENT OF TOURISM AND HOTEL INDUSTRY

Financial reports are defined as "a set of information about the financial position, performance, changes in capital and cash flows of a company" and represent a functional and time-rounded set of business processes that took place in a company and as such form the basis of any rational analysis. All company activities are aimed at creating value for owners and creditors.

Creating value for these interest groups takes place through three activities:

1. financial activities,

2. business activities,

3. investment activities.

Financial activities determine the company's relationship with current and potential owners and creditors. These activities include obtaining capital from own and borrowed sources. The acquired capital from these sources is invested in the acquisition of fixed and current assets that enable the company to perform its activities. These activities are calculated on the investment of money previously obtained in financial activity. That is why the activities of investing money are called investment activities. The activity of a company materializes through the performance of business activities. Business activities are related to the realization of key revenues, namely sales revenue and other revenues, as well as key expenses (costs of depreciation, materials, wages and other costs). The company's business activities are reflected in the income statement. All the mentioned activities represent business events (transactions) that accounting records and summarizes in financial reports at the end of the business year.

Fig. 9. Types of Business Activities

Source: https://cdn.wallstreetmojo.com/wp-content/uploads/2022/02/Business-Activities.jpg

All activities of a company are materialized in the following financial reports:

1. balance sheet,

2. income statement,

3. cash flow statement

4. report on changes in capital.

5. Notes on changes in capital

Investment activities are materialized in the balance sheet, as well as financial activities. The statement of cash flows and the statement of changes in equity are derived reports that are prepared on the basis of the balance sheet and the income statement. The term *"balance sheet*" refers to a financial statement that reports a company's assets, liabilities, and shareholder equity at a specific point in time. Balance sheets provide the basis for computing rates of return for investors and evaluating a company's capital structure, and:

1. A balance sheet is a financial statement that reports a company's assets, liabilities, and shareholder equity.

2. The balance sheet is one of the three core financial statements that are used to evaluate a business.

3. It provides a snapshot of a company's finances (what it owns and owes) as of the date of publication.

4. The balance sheet adheres to an equation that equates assets with the sum of liabilities and shareholder equity.

5. Fundamental analysts use balance sheets to calculate financial ratios. [9]

An *"income statement"* is one of the three important financial statements used for reporting a company's financial performance over a specific accounting period. The other two key statements are the balance sheet and the cash flow statement. The income statement focuses on the revenue, expenses, gains, and losses of a company during a particular period. Also known as the profit and loss (P&L) statement or the statement of revenue and expense, an income statement provides valuable insights into a company's operations, the efficiency of its management, underperforming sectors, and its performance relative to industry peers. And: [10]

1. An income statement is one of the three major financial statements, along with the balance sheet and the cash flow statement, that report a company's financial performance over a specific accounting period.

2. The income statement focuses on the revenue, expenses, gains, and losses of a company during a particular period.

3. An income statement provides valuable insights into a company's operations, the efficiency of its management, underperforming sectors, and its performance relative to industry peers.

The*"cash flow statement"* (CFS), is a financial statement that summarizes the movement of cash and cash equivalents (CCE) that come in and go out of a company. The CFS measures how well a company manages its cash position, meaning how well the company generates cash to pay its debt obligations and fund its operating expenses. As one of the three main financial statements, the CFS complements the balance sheet and the income statement. In this article, we'll show you how the CFS is structured and how you can use it when analyzing a company. And: [11]

1. A cash flow statement summarizes the amount of cash and cash equivalents entering and leaving a company.

2. The CFS highlights a company's cash management, including how well it generates cash.

3. This financial statement complements the balance sheet and the income statement.

4. The main components of the CFS are cash from three areas: Operating activities, investing activities, and financing activities.

5. The two methods of calculating cash flow are the direct method and the indirect method.

The *"statement of changes in equity"* is a reconciliation of the beginning and ending balances in a company's equity during a reporting period. It is not considered

an essential part of the monthly financial statements, and so is the most likely of all the financial statements not to be issued. However, it is a common part of the annual financial statements. The statement starts with the beginning equity balance, and then adds or subtracts such items as profits and dividend payments to arrive at the ending ending balance.

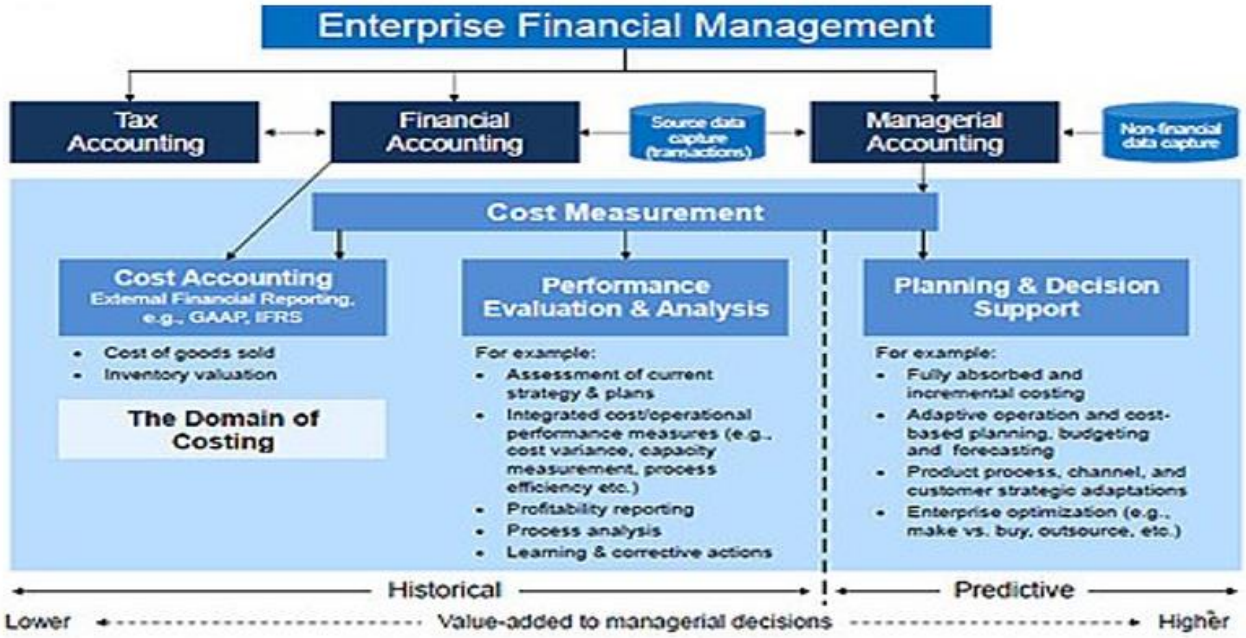

Fig. 10. Enterprice Financial Management

Source:https://upload.wikimedia.org/wikipedia/commons/thumb/2/20/IFAC_Definition_of_MA.jpg

The general calculation structure of the statement is as follows: [12]

Beginning equity + Net income – Dividends +/- Other changes = Ending equity

5. CONCLUSION

The company regularly analyzes its financial results (difference between income and expenses). The elements and causes of the obtained result are very diverse, so they should be analyzed separately. There may be a discrepancy between the desired and the actual financial situation. A critical discrepancy between the

desired and real state represents a financial problem. Any information of a financial nature can be used for financial analysis: bookkeeping, information from institutions of the banking system, information from stock exchanges, etc. The objectives of information analysis can be control and diagnosis of the condition, in forecasting the development of the company in which case, the diagnosis of the situation should be carried out first. Financial control is a set of measures and activities for checking the financial activity of the company, with the application of special forms and methods. Financial control confirms that financial policy, marketing and management achieve the set goals, or reveals financial problems (inconsistency...).

Control can be internal or external. External control is performed by various inspection and other state bodies, banks, etc. Internal control is carried out by their own control and supervisory services. The purpose and content of financial control is determined by the company's financial function. Financial control checks practically all operations that are carried out with the use of money: compliance with the law regarding the use of financial resources, financial condition, correct payment of taxes, etc. Information that enables financial management is found in bookkeeping and other records. Particularly important are the records on: the state of foreign currency accounts, the state of securities and insurance policies, approved but unused loans, debts and claims against creditors and debtors, etc. Financial information should include all information that is useful for financial decision-making. Information about: needs and sources of financial resources, inflow and outflow of funds, cash flows, financial placements. The development of finance has strengthened the role of financial management. Finance is changing from a descriptive study to a rigorous analysis and normative theory, from the area of raising funds to an area that includes asset management, capital allocation and valuation of companies in the overall market, from external analysis of companies to an area that emphasizes decision-making about the company. Financial policy aims at financial strength, and it is reflected in the principles. The principles of financial policy are interconnected, and the task of financial policy is their optimal equalization. They can be defined as

requirements that management must adhere to in order to maintain its status on the market, that is, if it wants to strengthen the financial strength of the company.

Results will be worse than planned if management does not adhere to these principles. In the twentieth century, with the penetration of Western schools of management, the English term management was generally accepted to denote the concept of management.In countries with developed market economies, the importance and necessity of a detailed study of the theoretical and practical scope from the domain of management and the role and importance of management in the company's operations is especially highlighted. Management has been defined by different authors and practitioners in numerous ways, depending on which aspect of the problem they wanted to emphasize.In general, the content of the definition of management has changed with the changing nature of the environment in which organizations operate. According to the Bible, the movement of the Israelites towards the promised land was slow, because it was spontaneous and insufficiently organized. Around 1500 BC, Moses solved the problem by creating groups and appointing their leaders and managers, thus facilitating and speeding up the arrival in the promised land. Many authors use this example as the earliest attempt to generate useful ideas about the use of management for practical purposes.

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Other professional sciences

MODERN ECO-ARCHITECTURAL TECHNIQUES IN THE DESIGN OF PHYSICAL CULTURE AND LEISURECOMPLEXES OF UKRAINE

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Abstract. *The article analyses the main methods and principles of green building, and gives the main conditions for the successful design of "green" buildings. "Green" architecture is a current construction trend, one of the elements of ecological approach in architecture, providing an inseparable connection of modern buildings with the environment. The world experience of designing sports centres in Germany and Austria has been studied. The trend of combining natural elements and architecture is shown to be relevant. Landscape design of areas allows you to create a visual continuity between the building and the surrounding area. "Green" roofs also refer to the world standard for the construction of sports complexes (France). An analysis of international "green" sports facilities projects has shown that the development of this trend is based on the principles of combining natural components with architectural shaping. The necessity of introducing certification of sport facilities according to "green" standards is shown. Certification is a natural extension of the design process, as the requirements of an environmental standard are based on the principles and approaches of the sustainable development concept.*

The aim of this study is to introduce elements of international "green" building standards in the design of a sports and recreation facility in Ukraine (Lyski, Odessa region). The project has highlighted and detailed two priority areas - green roofing

and landscaping of the surrounding area. Around the building is a spacious park with plants and trees that go up in stages (lawn, bushes, deciduous and coniferous trees). Their use will provide noise reduction and have a positive effect on the psycho-emotional state of visitors. The park space is planned with the use of small architectural forms and serves as a place to walk and relax. A "green" roof or roof garden construction will provide passive energy saving through thermal insulation properties, oxygen production, air humidity control, and neutralisation of dust and harmful gases in the surrounding space. The project aims to improve the environmental situation in the project area, creating an interesting and environmentally friendly architectural object.

Keywords: *"green" architecture, ecological problem, eco-system, greening, "green" roof, yoga centre.*

Introduction. The international architectural industry already has strict standards and certifications for buildings and structures. Many environmental certification standards have emerged (LEED; BREEAM, WEL. Fitwel and others), which implement the principles of eco-architecture. The main feature of ecological architecture is love and respect for nature. This concept in architecture, also known as "green" architecture, reduces the impact of the building on the environment and ecosystem.

The environmental problem has become the most urgent one in everyone's sphere of life these days. Mankind has become aware of the need to conserve natural resources and environmental problems. Global urbanisation has led to new sources of environmental transformation and pollution. There is a need to find effective solutions to existing problems. For this it is not enough just to green the area, it is also important to develop architecture using modern trends in design, i.e. "green architecture". Eco-architecture can be one way of solving a whole range of environmental problems.

The economic benefits of operating green buildings lie on the surface: reduced

energy consumption leads to lower energy bills; reduced water consumption reduces the cost of water supply; the introduction of green building principles shapes public opinion and promotes the popularity and return on leased space; "green" buildings that are certified can receive tax breaks and subsidies; the high comfort levels of green buildings contribute to the health of their occupants [1].

Among the global trends in green building are the increasing attention and interest in the creation of artificial eco-systems that could mimic the properties, processes and design of ecological systems in nature, including the creation of autonomous energy-efficient buildings.

The purpose of the study. Implementation of the world experience of "green" construction in the project of a sports and recreation facility.

Green components in shaping the eco-environment.

In the modern world, the issue of environmental ecology and human health is increasingly being raised. Urban growth, a large number of enterprises and human activity are destroying nature with its many landscapes and vegetation.

A physically developed body is good and beautiful, but it is not a guarantee of health and longevity. Speaking about the positive role of physical development, we should not forget about the state of mind: it is mental balance and inner harmony that affect health and contribute to longevity. From a medical point of view, the key to health and longevity lies in endorphins - the hormones of joy: serotonin and melatonin. The production of these hormones, in turn, depends on the mood with which a person perceives the world around them. It is the natural environment that surrounds a person that has the most favorable impact. It helps people to relax, restore physical strength, enrich their spiritual world, and improve their health.

Scientific studies show that unity with nature helps to reduce anxiety, relieve stress and even lower high blood pressure. Contemplation of the beauty of nature stimulates vitality and calms the nervous system, providing positive emotions. This

state is achieved by the aesthetic expressiveness of the landscape. A person gains peace, tranquility, mental balance, and thus recovery [2].

Greening is not only aesthetic, but also has a positive effect on the urban environment. Through photosynthesis, plants produce oxygen and also have the property of clearing the air of dust and gases, reducing their concentrations. The total area of green spaces in cities should occupy more than half of its territory.

Many scientists have explored the interaction of architecture and nature in their work. The definition of "green architecture" has not yet reached a theoretical generalisation. The questions of the methods and principles of Green Architecture have not yet been fully addressed in scientific and theoretical works.

Modern architects and designers use methods of incorporating natural elements in architecture. These include: Renzo Piano, Friedensreich Hundertwasser, Andri Putman, Ralph Hancock, Jean-François Dores [3], Patrick Blank, Stanley Hart White and others. In their projects they used different ways of vertical gardening and green roofs. However, there have been people passionate about and exploring the idea of growing 'living' structures with the implementation of this in their projects (Axel Erlandson, Peter Cook, John Krubsack, Ferdinand Ludwig [4], Arthur Wichula, Giuliano Mauri, Alessandro Rocca, Joachim Mitchell and others) implement the idea of growing "living" structures (Fig. 1).

A special feature of Green Architecture is the introduction of plants - living material. Therefore it is always in a state of "movement" - growing and developing, always changing through the cycle of seasons, temperature, light. Plant architecture is a good vector for biovariety as well. Plant walls, terraces, green roofs have a great influence on the effect of biological passageways to be created in the city.

Studying the experience of Green Architecture and using its current trends is relevant and timely both globally and in Ukraine. Historical architecture and urban planning in Ukraine used to exist in harmony with nature, as evidenced by the large areas of green spaces in the country. But modern trends of intensive urban

development over parks and green areas lead to the fact that nature is gradually disappearing from the cities.

Fig. 1. Natural elements in eco-architecture

The challenge of developing Green Architecture for design and construction consists of finding the right place for plants (as living material) among buildings that will be located in the most efficient living conditions and will be useful and beautiful for the environment, creating a harmonious relationship with the architectural structures.

The use of natural components in the formation of architecture can vary depending on the volumetric-spatial, functional, and constructive task (interiors, courtyards, roofs, building facades, balconies, terraces, galleries, loggias, individual buildings and objects, small architectural forms, landscape aeration, etc.) All these methods of using natural elements improve the aesthetic, psychological, planning, functional, energy-efficient and structural qualities of the building and its plots. They

reduce noise levels, affect temperature, refresh the volume, have a positive effect on people, improve mood, and serve as natural insulation.

The objects of the study were examples of "green" buildings for sports and leisure centres in global experience. These architectural projects use different principles of "Green Architecture".

First and foremost, Green Architecture is the art of shaping space by means of the natural landscape. Greenery is the main building material for such creativity. With the right planning, plants can become the material for most building elements instead of those that people build with metal and concrete.

"Green architecture integrates the natural landscape into architecture by using natural components to create forms, uniting architecture with nature. Thus, nature, which is being displaced from urban areas, can be returned to the interior or exterior space of buildings and structures or created from natural materials. [5]

One such example is the Kaltensteinhalle project, a wooden gym in Germany (Fig. 2).

Fig. 2. Kaltensteinhalle gym project, Germany, 2021

The new gym was designed as a compact, functional and very economical structure made of wooden elements. Only the parts in contact with the ground are made of reinforced concrete. The design takes advantage of the terrain to place functional blocks on several levels. Most of the hall is built into the slope. The elegant appearance of the building continues in the materials: the wooden supporting structure remains visible, the interior of the hall is decorated with simple and durable

wooden elements.

Landscaping is an important component of an effective building design. Landscape elements can provide buildings with benefits such as shielding them from the sun, protecting them from the wind, contributing to passive cooling, and creating opportunities for natural ventilation. In addition, landscape elements can be useful for purifying air and water, absorbing floodwater, improving aesthetics, providing recreational amenities, and developing ecological habitats for wildlife [6]. For example, the FSF sports and entertainment center in Austria (Fig. 3).

Green roofs are an important component in ensuring the sustainability of holistic development in construction. In addition to their economic role, they also play an important environmental role. The benefits of roof greening fall into three main categories: rainwater control, energy saving (thermal insulation, reduced energy consumption) and providing an environmentally friendly urban environment.

Fig. 3. FSF sports and entertainment center, Austria, 2021

Adherence to installation technologies is a key component of the success of

such a project. It is necessary to correctly summarize the weight of all the layers (insulation, drainage, soil, and plant), as landscaping creates an additional load on the supporting structure of the roof and the entire building and it is important to take this into account so that the plants do not destroy the roof [7].

Roof greening has become a global standard, mandatory for the construction of buildings in a number of countries. Ukrainian cities continue to be actively built up, so it is only a matter of time before this type of greening is introduced into state building codes, but the sooner this decision is made, the sooner Ukraine will be able to adopt the experience of other countries and prevent our cities from turning into "stone jungles."

At this point in time, rooftop greening is popular all over the world and there are many fascinating examples of this architectural solution. One of these examples is the presented project of a sports complex located in Montjoie Park, in the center of Saint-Cyr-sur-Loire (Fig. 4).

Fig. 4. Sports complex at a primary school and kindergarten for students, France, 2019

The architects sought to design a building that combines architecture and landscape, creating a sense of visual continuity between the landscape park and the building. When viewed from the entrance to the park, the massiveness emphasizes

the horizontal layout. Landscaping plays an important role in the appearance and layout of the building. It is an integral part of the design, making its presence visible everywhere. The "green roof" creates a sense of continuity with the park, the playground is interspersed with grassy banks that descend from windows throughout the building; and the kindergarten's rooftop educational garden with insect corner and vegetable beds is an ideal place to learn about nature. The main building is surrounded by two playgrounds: a sports ground and a children's playground, which overlook the park.

Research object: a project of a yoga center in Lisky village (Odesa region, Ukraine).

Purpose of the study: to consider the main features of green architecture in modern construction using examples of experience in designing green facilities; to show that eco-friendly architectural solutions make it possible to improve the environment and create an interesting and attractive architectural object.

Research methods: The study used general scientific methods - studying literature sources, conducting theoretical analysis, comparing, systematizing, and generalizing theoretical observations on modern trends in green architecture.

RESULTS

Based on the results of the research, a project of a yoga center in the village of Lisky, Odesa region, with a developed greening system was developed (Fig. 5). The building is being designed in the relatively young but actively developing Limansky district of Odesa region on the border with Suvorovsky.

The building was designed in a mixed Modern and Bionic style. These styles are characterized by the laconicism of the image, maximum functionality, the absence of a large amount of decor, a harmonious combination of space and form, and the most advantageous combination of glass and concrete.

The project development includes measures aimed at protecting the environment from pollution, preserving the fertile soil layer and atmospheric air. The

project envisages the use of energy-saving, environmentally friendly materials and structures.

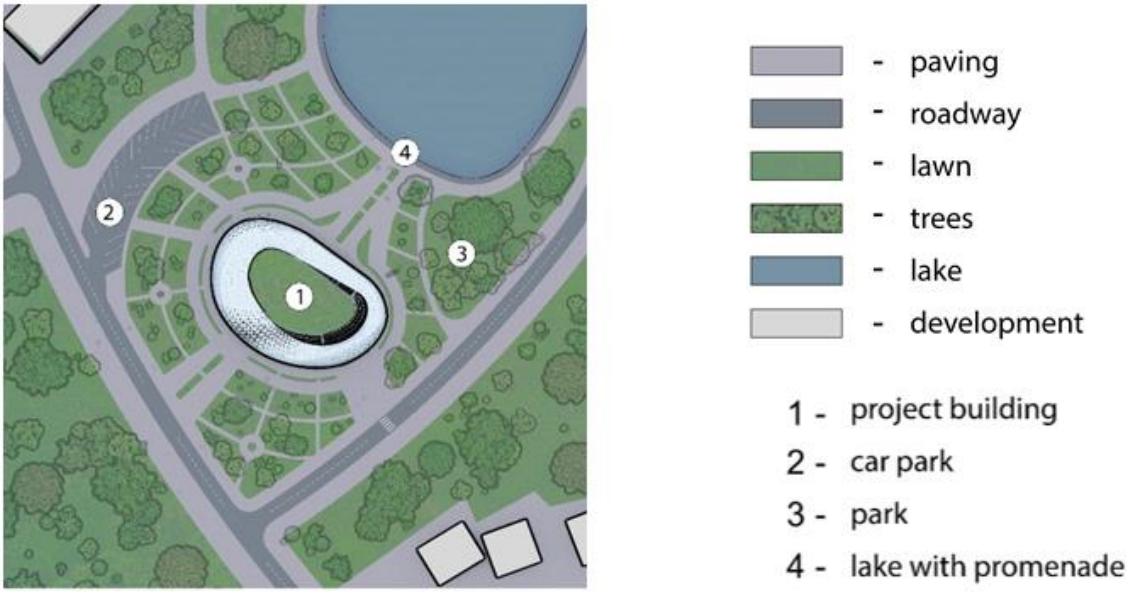

Fig. 5. General plan of the yoga center project and photo of the project site (Lisky village)

The aim of the project is to create a comfortable space for people who are passionate about yoga and other spiritual practices. Lecture halls and study rooms have been designed for sharing experiences and holding mass events (Fig. 6).

The use of large halls for group yoga classes, meditations and other practices is also envisaged. The projected building is designed for sports activities for people of all age groups, from young children to the elderly.

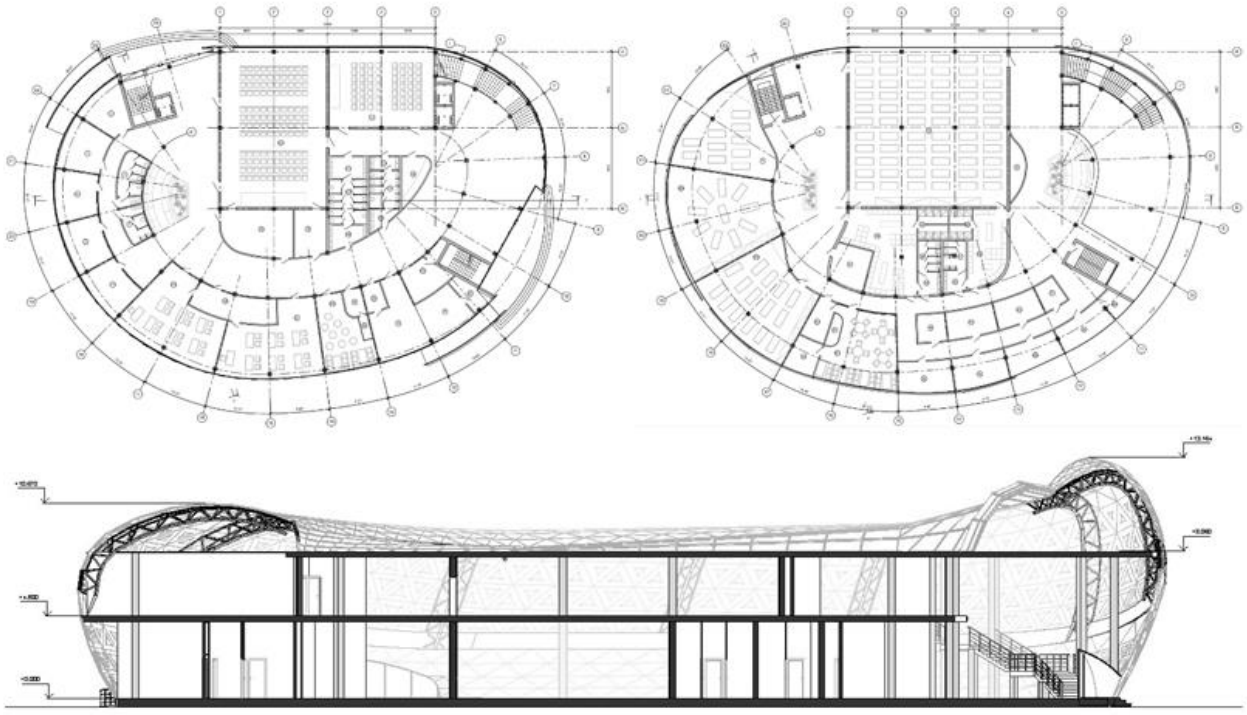

Fig. 6. Layout of the yoga centre and structural cross-section of the building

This is aided by an attractive façade and a location that is quiet and away from the noise of the city. The grounds include a spacious park with a promenade around the lake.

The voluminous structural façade panels, made in the form of a repeating flower of life pattern, have a sacred meaning, which is also aimed at attracting the club's target audience.

The use of specific elements of green architecture will create an environment that can improve psychological comfort and the ecological situation in the projected area.

Two priority areas were identified and elaborated in the project: the development of a green roof and landscaping of the adjacent territory. The spaces are planned with the use of small architectural forms and green spaces: a natural pond, benches with decorative planters, tree plantings, trimmed shrubs, and a lawn. The spaces are planned to be arranged as a zone for combining yoga and recreation (Fig. 7).

A spacious park with gradually rising landscaping (lawn, shrubs, deciduous and coniferous trees) has been designed around the building, which reduces noise levels, has a positive effect on people, improves mood, and serves as a place for walking and relaxation.

In addition, many woody shrubs and flowering plants release phytoncides into the air. They enhance the body's immunological reactions and tissue regeneration processes, which is important for visitors to sports centres [8].

High-tech solutions that increase comfort levels, longevity of structures and meet a number of environmental requirements of 'green' standards include the greening of the "fifth facade", or the construction of rooftop gardens.

Fig. 7. Perspective images of the yoga center project (Lisky village)

The project envisages the installation of a green roof, which will provide passive energy saving, expressed in the significant thermal insulation properties of the green roof for the building (preventing roof heating and retaining heat in the

building). Environmental benefits of a green roof: generation of additional oxygen, regulation of humidity, neutralisation of dust and harmful gases in the surrounding space, accumulation of rainwater.

Practical advantages of green roofs:

- Green roofs are far more durable than conventional roofs if the technology is followed, as the multi-layered "cake" of modern materials with a "glaze" of plants serves as the best waterproofing and thermal insulation for the rooms underneath. The service life of a green roof is extended by the service life of the roof by a factor of 2-3;

- a flat green roof becomes a useful area and can, depending on the type of greening, be used for a wide variety of purposes as a compensation for the lack of greenery in the city [9].

CONCLUSIONS

"Green architecture" seeks to reduce the negative impact of buildings on nature and ensure only a positive impact on the lives of current and next generations.

The definition of "Green architecture" has long gone beyond just landscape design. The study of experience in the design and construction of modern "green" objects leads to the following conclusions: the design of "green architecture" is a new stage in the development of modern architecture, based on the principles of connecting natural components with architectural shaping.

Methods of "green" roofing and landscaping of the adjacent territory are used in the design of the yoga centre (Ukraine, Lisky). The project aims to create an environment that can increase psychological comfort and the environmental situation in the projected area with the application of elements of "green architecture".

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