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ECONOMICS

METHODOLOGICAL APPROACHES AND MAIN FACTORS FOR THE ESTABLISHMENT OF STRATEGIC OIL AND GAS STOCKPILES OF NATIONAL ECONOMY

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Annotation. *The article discusses the problem of methodological approaches for the establishment of strategic oil and gas reserves of the national economy. Analysis of advantages and disadvantages of Model of Short Term Energy Security, Model of Analysis of Energy Demand and Model for Energy Supply Strategy Alternatives and their General Environmental Impact was made. Analytical tools provided by these models can be used to evaluate both internal and external factors. The feasibility of stockpiles establishment can be determined using well-known traditional management tool – SWOT analysis. Ukraine has to comply with EU energy Directives and Regulations regarding the creation of oil stockpiles by 2023 as a member of the Energy Community. Under the provisions of the EU-Ukraine Association Agreement, The Energy Strategy of Ukraine by 2035 envisages the creation of the system of oil and gas strategic stockpiles.*

Key words: *National economy, strategic stockpiles, model, establishment, SWOT-analysis.*

The world economy periodically faces energy crises, which mostly have artificial nature and are caused by various reasons. Such crises lead to disruptions and limiting energy resources supplied to consumers.

Energy crises have negative consequences for the economy of any country as a whole. Such crisis may be provoked by different factors – social unrests (strikes), political reasons, war conflicts, terrorist attacks etc. The results of such crises are the sharp rise of prices for oil, petroleum products and natural gas as well as the emergence of "panic moods" among consumers. To overcome negative results of energy crises some methods are practicing worldwide, for instance establishment of a system of strategic oil and gas stockpiles (reserves), production surge, fuel switching, demand restraint measures.

Regarding Ukraine's situation, the most effective tool for ensuring the stable functioning of national economy and safeguarding it from the consequences of an energy crisis, most experts recommend initiating the system of strategic oil and gas stockpiles. Worldwide strategic oil and gas reserves have proven to be the most powerful response mechanism available during oil or gas supply disruptions.

The process of strategic oil and gas stockpiles establishment requires evaluating different methodological approaches and making research of factors that influence such establishment. Proper identification of these factors may lead to avoiding and overcoming the risks that may arise during the establishment of strategic oil and gas stockpiles (reserves) of National Economy (SOGS).

As significant energy importer, Ukraine has a high degree of vulnerability to "energy" crises, which may be caused by interruptions in the supply of energy resources. Therefore, the establishment of SOGS may be regarded as an important step towards ensuring Ukraine's energy independence and domestic energy market stability. According to Ukraine's obligations in Energy Community and to the Association Agreement between Ukraine and the European Union, Ukraine has to adapt its legislation to the requirements of the European Union legislation, which main task is to ensure the availability of energy resources during supply crisis at the market. It is important to use international experience while settling the issues of SOGS initiating and maintaining. European Union Directive 2009\119\EU obligates the EU Member States to maintain a minimum level of stocks of crude oil and/or petroleum products in the amount of 90 days of import or 61 days of domestic consumption. The EU Regulations 994/2010 (2010) and 2017/1938 (2017) require preparing a risk assessment and development of response plans in case of energy supply crises.

Some steps and relevant initiatives have already been introduced in Ukrainian legislation. For example, the Law of Ukraine "On the Natural Gas Market" already contains conceptual definitions like “Crisis situation” “National Action Plan”, “Insurance stocks of natural gas” and recommendations.

In order to investigate the feasibility of SOGS establishing in Ukraine, it is expedient to use analytical tools that have confirmed their validity and management practices in other countries. It should be emphasized that such instruments allow answering the question of how the establishment of SOGS system is appropriate for a particular country, taking into account availability of its own energy resources balance, the degree of concentration of deliveries by suppliers and other important factors.

The most frequently used analytical tools for evaluation of SOGS establishment in international practice are Model of Short Term Energy Security (MOSES), Model of Analysis of Energy Demand (MAED) and Model for Energy Supply Strategy Alternatives and their General Environmental Impact (MESSAGE). Undoubtedly, these models do not cover all analytical tools that can be used to assess the feasibility of establishment of SOGS but they are the most widely used (Table 1).

Table 1

Brief description of time horizon and purpose of analytical models, based on [1, 2, 3, 4, 5]

Analytical model	Time horizon of the model	Purpose of the model
MOSES	Short term	Assessing of state's energy security vulnerability level by determining risks for the energy system and evaluating its resilience potential in case of supply disruption under influence of external and internal factors.
MAED	Middle and long term	Forecasting demand for energy resources.
MESSAGE	Middle and long term	Identification of alternative energy supply strategies and their environmental impact.

So, each of these tools can be used to assess the feasibility of SOGS establishing in the context of ensuring the state's energy security, meeting the future energy demand or implementing alternative energy supply scenarios. The presented tools are relatively independent of each other and can be used both together and each separately (Table 2).

Table 2

Brief description of content of analytical models to analyse feasibility of the SOGS establishment, based on [1, 2, 3, 4, 5]

Analytical model	Brief description of the model
MOSES	The model examines both risks and resilience factors associated with short-term physical disruptions of energy supply that can last for days or weeks. MOSES extends to monitor and analyse several important energy sources (oil, gas, oil products etc.), as well as the non-energy components (such as infrastructure) that comprise an energy system. Analysis of vulnerability for fossil fuel disruptions is based on risk factors, net-import dependence, political stability of suppliers. Resilience factors include the number of entry points for a country (e.g. ports and pipelines) and the diversity of suppliers.
MAED	The model evaluates future energy demand based on medium to long-term scenarios of socio-economic, technological and demographic trends. The model relates energy demand for producing various goods and services, which were identified in the model to corresponding social, economic and technological factors. Energy demand is disaggregated into a large number of end-use categories. Each of them is corresponding to service or production of a certain product. The level of demand for goods and services is a function of several determining factors including growth of population, number of inhabitants per dwelling, number of electrical appliances used in households, national priorities for the development of certain industries or economic sectors, emerging and penetration of new technologies into market and expected future trends.
MESSAGE	The model combines technologies and fuels to construct so-called “energy chains”, making the “map of energy flows” from resource extraction to energy conversion (supply side), distribution and provision of energy services (demand side). The model helps to design long term energy supply strategy and tests energy policy options by making analyses of cost energy mixes, investment needs and costs for new infrastructure, energy supply security, energy resource utilization, rate of introduction of new technologies, and environmental constraints.

Inputs and outputs of the MAED and MESSAGE models are respectively described on Fig. 1 and 2 [7].

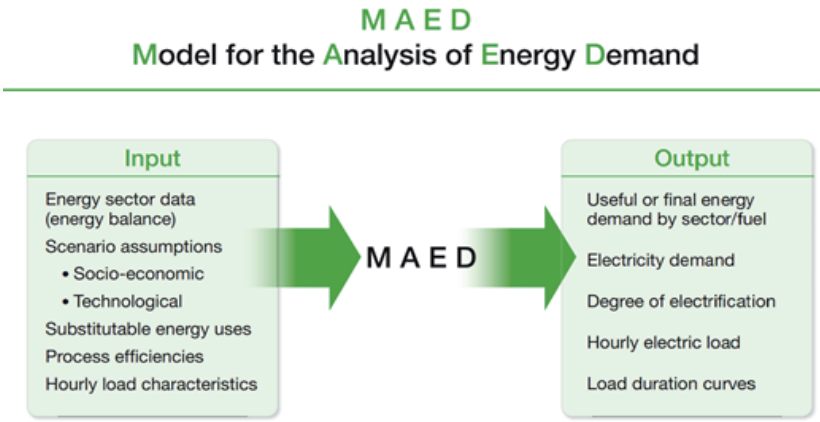

Fig. 1. Inputs and outputs of MAED model [7].

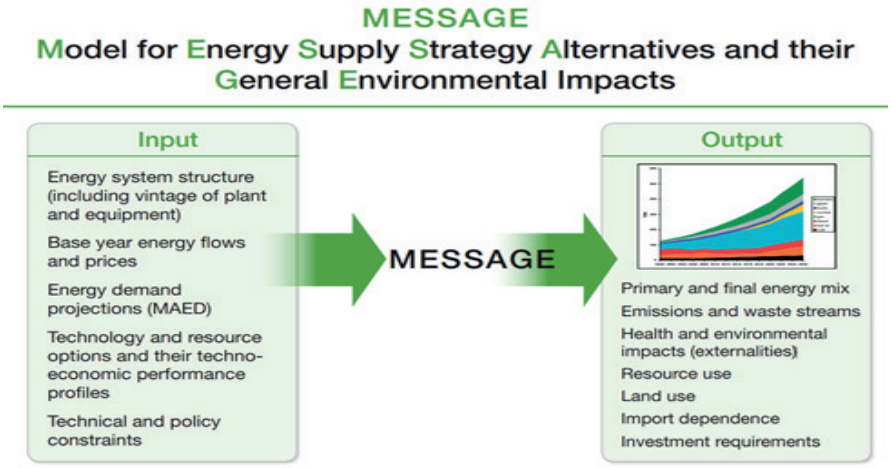

Fig.2. Inputs and outputs of MESSAGE model [7].

The MOSES model in practice uses four dimensions of energy security: external factors (including import dependence) and internal factors (extraction, processing) that are analysed in the context of risk and resilience (Table 3). There are 35 indicators used for different energy sources in this model. Indicators used in MOSES were identified according to existing academic and professional literature and through expert consultations.

Table 3

Dimensions of energy security considered in MOSES [based on 1, 2]

	Risk	Resilience
External	Risks associated with potential disruptions of energy imports.	Ability to respond to disruptions of energy imports by substituting with other suppliers and supply routes. Risks arising in connection with domestic production and transformation of energy
Domestic	Risks arising in connection with domestic production and transformation of energy	**Domestic ability to respond to disruptions in energy supply such as fuel stockpiles.**

After assessment of considered models, we can define their advantages and disadvantages, which are described in the table 4.

Thus, the assessment of feasibility of strategic oil and gas stockpiles creation should be made before their establishment. To make such assessment toolkit that contains MOSES, MAED and MESSAGE models can be used. Each of the analysed models has both its advantages and disadvantages, as well as the purpose of the application. However, MAED and MESSAGE models have more deficiencies than the MOSES model. Namely, it seems easier and clearer to analyse factors for the establishment of SOGS through MOSES model. A composition of the factors that are necessary for the establishment of SOGS with a division of their direct and indirect influence is described in Fig. 3 (based on [6]).

Table 4

Advantages and disadvantages of analytical models to analyse the feasibility of establishment of SOGS (according to results of the author's analysis based on [1, 2, 3, 4, 5])

Analytical model	Advantages of the model	Disadvantages of the model
MOSES	Multipurpose character (such as calculation of energy balance and scenarios of its changes, as well as determination of risks and resilience of the energy system). Consideration of a large number of factors. The established list of indicators to be used. Energy security profiles of the state.	Interval (zonal) character of interpretation of indicators.
MAED	Flexibility of scenario results. Presentation of the results in a quantitative scenario form, that allows using it as a predictive benchmark in the process of development of the country's energy system.	Complexity caused by unclear input and plurality of analytical relationships between primary data and calculated results. High sensitivity to the primary data. Sensitivity to forecast reliability. Need for complex tools for making calculations.
MESSAGE	Environmental effects are taken into account during the development of the state energy system. Receipt of investment requirements. Flexibility of scenario results. Presentation of the results in a quantitative scenario form, which allows using it in the process of development of the country's energy system.	Using results of MAED model as an input information.

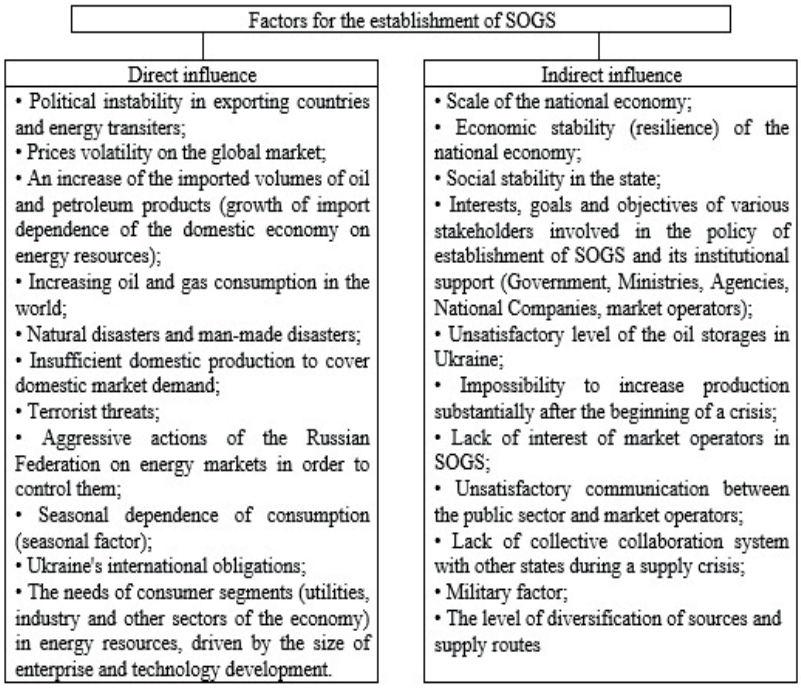

Fig. 3 Composition of factors of SOGS establishment

Source: systemized by author

The set of factors of the formation of SOGS, structured according to certain criteria, on the one hand, creates an analytical basis for a reasonable calculation of the magnitude and structure of SOGS according to approaches used in MOSES model. On the other hand, such set of factors can be assessed through the set of risks that will affect the maintaining of SOGS, (Table 5).

Table 5

Type of risk	Description of risk
Physical risks	Physical depletion of deposits, cease of production. Temporary supply interruption because of a natural disaster or an infrastructure accident.
Economic risks	Oil prices volatility, imbalances between supply and demand on the market.
Political risks	The desire of exporting countries to use energy as a political instrument.
Regulatory risks	The weak regulatory environment in exporting countries.
Social risks	Influence of social conflicts on energy prices (sabotage, strikes).
Environmental risks	Influence of environmental disasters (hurricanes, earthquakes, landslides, floods, etc.) on processes of extraction and transportation of energy resources.

Source: Summarized by author

For Ukraine we have to consider additional risk connected to the policy of the Russian Federation – namely, the risk of dependence from supply conditions, political preferences with voluntarist decisions of its political leaders. We can call this type of risk as "Risk of one source supplier".

The feasibility of SOGS's establishment as an element in the national economy can be defined using well-known traditional management tool – SWOT analysis. Such tool is widely used in management practice and it has confirmed its methodological validity and practical value.

SWOT analysis allows comprehensive determining internal factors, which are mainly situated in the S and W zones, and the external ones, which are mainly in O and T zones. For the SWOT analysis in relation to the issue of initiating SOGS, the analytical tool itself should be upgraded. "Strengths" and "Weaknesses" are suggested to be considered as positive and negative sides for creating such stockpiles. This viewpoint is explained by the fact that from the methodological point of view the strengths and weaknesses of the system are correctly considered in relation to the subject of the action or the agent of action, therefore it is quite fair to analyse the strengths and weaknesses of the enterprise. SOGS by itself are not the subject of action, they may have positive and negative aspects of their creation on National Economy as a whole. According to such methodological additions SWOT analysis of initiating the SOGS is presented in Fig. 4 (summarized by the author, based on [8, 9, 10]).

Carried out SWOT analysis allows drawing some conclusions: SOGS creates important opportunities for the national economy's flexible domestic demand in energy resources and for avoiding energy crises while using the so-called "energy weapon". The analysis allows determining, in the first approximation, the main directions of necessary actions regarding the feasibility of SOGS establishing.

Analysis of internal factors	**Strength (positive aspects)** Availability of strategic stockpiles at the national economy level, which are sufficient to meet the needs of the domestic market over a predetermined period.	**Weakness (negative aspects)** Uncertainty about the size of SOGS; Limited availability to meet demand in the short run; Absence of the necessary regulatory documents; Lack of economic and organizational mechanism for establishment of stockpiles; Inertia of the management system of the SOGS, which may reduce the effectiveness of their use; Lack of a single regulator and entity for the management of SOGS; Need to immobilize a significant amount of financial resources for establishment of SOGS; Additional costs for technologically safe maintenance and service of SOGS.
Analysis of external factors	**Opportunities** Compensation mechanism as a response to energy crises caused by supply disruption; Reducing the country's political dependence as a result of increasing resilience to energy crisis; Formation of a time lag to diversify suppliers of imported energy resources; Levelling of social unrest that may arise in case of energy supply disruptions on the domestic market; Creating a capacity to meet the energy needs of national economy during a supply disruption crisis.	**Threats** The emergence of corruption risks by certain officials of state authorities, which may lead to overestimation of the SOGS, poor quality of resources, etc.; Insufficiency of the SOGS to meet the needs of the domestic market in case of supply disruption; Active (including using lobbying tools) opposition of energy market operators to SOGS establishment; The usage of the SOGS for other purposes, in particular to meet the commercial interests of energy market players; The inconsistency of actions between public authorities and stakeholders; The unpreparedness of Ukraine's technological infrastructure to the formation and maintenance of the SOGS.
Consequences	Positive	Negative

Fig. 4. Matrix of the adapted SWOT analysis for SOGS
Source: Summarized by author

So, for the further researches using MOSES, MAED and MESSAGE models, and combining with SWOT analysis, it's possible to specify the size of SOGS in Ukraine. Such specification will depend on the influence of various factors and crisis response scenarios, developed measures to minimize the risks and the negative impact of the defined factors mentioned above on the energy supply to Ukraine, establishment of relevant institutional and legal framework for SOGS functioning. As well, it will allow adapting theoretical and methodological tools of proposed economic analysis methods to the variety of challenges the future SOGS system will face to cope with oil and gas supply disruption crisis.

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INFORMATION SECURITY AUDIT SPECIFICITY

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Annotation. *The article highlights the basic problems of information security with the focus on the need to work out effective methods of auditing the information security. The article tackles three main approaches to the analysis of the results of an information security auditing. The authors suggest the matrix methodology of a complete information security audit. It gives the auditor an opportunity to summarize the results of auditing of every component of the information security on the basis of unification of the data, obtained in the result of the analysis of technical and software components of the information system, analysis of the safety level of information resources and analysis of the personnel.*

Key words: *information security audit, types of information security audit, threats to information security, information and communication technologies, cybercrime, complex audit, security standard.*

Setting of a problem. The use of the automated systems in nearly all spheres of human activity, the utilization of modern information and communication technologies caused a number of problems for the developers and users of these systems. One of the most acute problems is the problem of information security, which needs to be protected, monitored and ensured conditions for its effective management. Modern enterprises need to have an objective assessment of the current level of their information security in order to protect the information systems against hackers attacks. It is for these purposes that an information security audit is applied. Today, auditing is one of the main instruments for monitoring the security of information assets of the organization. This service is carried out both in conjunction with the general IT-audit and in the form of an independent project. Often, auditing is an integral part of complex information security projects, which allows for an objective and independent evaluation of the current state of the automated system security. The results of the audit are the basis for the formation of the information security strategy of the enterprise.

Accordingly, there is a need to integrate the principles of assessing the security of information with international trends in the this field and there is also a need for the development and adoption of the consolidated system of approaches that would determine the promising directions of an information security audit, including the development of effective methods for conducting it.

Analysis of recent researches and publications. The international standards of ISO/IEC 17799:2000 «Information technology–Code of practice for information security management», BS 7799-2:2002 «Information security management systems–Specification with guidance for use», BSI PD 3003:2002 «Are you ready for a BS

7799-2 audit?», BSI PD 3004:2002 «Guide to the implementation and auditing of BS 7799 controls», ISO/IEC «Control Objectives for Information and Related Technology, COBIT» [1-5] have been chosen as theoretical framework of this investigation. The substantiation of the methods, models and mechanisms of information security auditing is based on the principles of these standards and takes into account theoretical considerations of the Ukrainian and foreign scientists (Holushko V., Winer N., Kini R., Pryhozhyna I., Peregudova P., Iminova O., Zamula A., Bartko M., Kuharska N. and others).

However, not only the theoretical assumptions indicate the necessity of forming a unified model of information security auditing, but also the level of computerization and informatization of the business entities in various branches of economy, which in 2017 reached almost maximum in the indicators (Table 1).

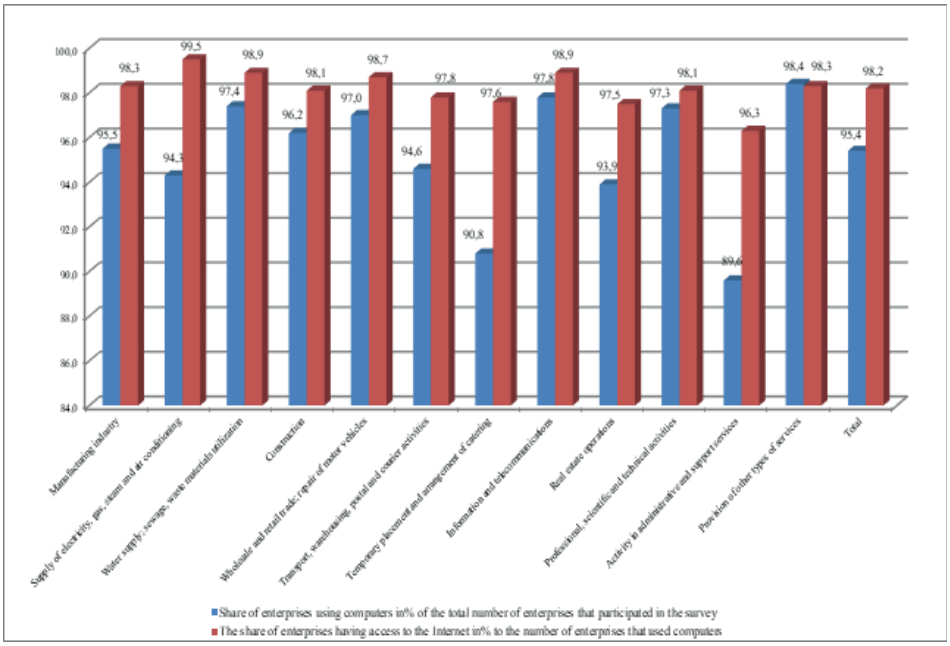

Fig. 1. The level of information and communication technologies utilization in Ukraine in 2017 [6]

The data indicate that the level of computerization of the Ukrainian enterprises in 2017 was 95.4%, and the level of using the global network Internet in general is 98.2%. The global network is mainly used for sending or receiving e-mail messages, for performing banking operations, for receiving information about goods and services or getting information from the state authorities (Table 1). Concurrently, the present level of telecommunication, information and computer technologies development gives rise to the emergence and rapid development of social relations regarding their use. This also requires their accounting and analysis, continuous monitoring and regulating their

utilization that could meet the interests of the economic entities.

At the same time, the information space has become both a place and a direct instrument of the crime [7]. The main tool of the hacker is a computer and the unauthorized access to the information and communication systems, where he receives access to databases, bank accounts, automated control systems through computer viruses and other illegal technical means.

Table 1

The Range of Using the Internet by the Enterprises of Ukraine in 2017 (од.) [based on 6]

	Used the Internet for							
	Sending or receiving emails	Making phone calls through Internet/VoIP communication or video conferencing	Obtaining information about goods and services	the use of instant messaging and e-mail ads	receiving information from state authorities	caring out various operations with state authorities (except for information)	banking operations	access to other financial services
Total	38929	12048	34663	18704	31571	20158	38227	15535
Manufacturing industry	9792	3215	9012	4927	7958	5049	9604	3952
Supply of electricity, gas, steam and air conditioning	637	192	585	305	576	354	629	299
Water supply; sewage, waste materials utilization	1034	169	926	464	913	457	994	431
Construction	3977	824	3589	1761	3033	1888	3893	1567
Wholesale and retail trade; repair of motor vehicles	9732	3400	8943	4926	7954	5353	9651	3894
Transport, warehousing, postal and courier activities	3156	937	2676	1415	2489	1539	3074	1254
Temporary placement and arrangement of catering	1148	246	980	506	893	580	1123	423
Information and telecommunications	1770	939	1606	1067	1535	1053	1750	805
Real estate operations	2483	464	1939	878	1913	1114	2420	815
Professional, scientific and technical activities	2440	1024	2169	1265	2094	1422	2381	1020
Activity in administrative and support services	2701	613	2182	1160	2163	1316	2651	1055
Provision of other types of services	59	25	56	30	50	33	57	20

At the same time, cybercrime is becoming increasingly global. The latest technologies allow the real criminals to be anonymous, and the ease of rapid enrichment tempts to join this criminal activity (see Table 2).

Table 2

Registered criminal offenses in the area of the use of electronic systems and computer networks of telecommunications in 2017 [based on 8, 9, 10]

Year	Registered	Criminal offenses in which proceedings are closed	Recorded criminal offenses in the reporting period	The criminal offenses for which proceedings were submitted to the court (including the proceedings of the previous years)	Identified persons who have committed criminal offenses
2017	3 178	605	2 573	1 076	168

Thus, the number of the detected crimes in the field of cyber security in Ukraine increases by an average of 2.5 thousand annually, which necessitates the formation of an effective mechanism for conducting an information security audit at various levels of management

Goal setting. The purpose of the article is to substantiate the methodology for information security audit adapted to the domestic enterprises.

Presentation of basic material of the research. The problem of conducting an audit, as an evaluation procedure for complex systems, is considered in the classical works of N.Wiener, R.Kinie, H.Reiff, I.Prihozhyn [11-14]. N.Wiener lays emphasis on the requirement of non-interference of the person in the process, from the moment of input of the initial data to the moment of obtaining the result [11]. R. Kinie and H. Reiff focus on the flow of the data that come directly into the process itself, noting that the development and analysis of possible alternatives to action definitely depend on information that becomes known only in the process [12].

In his fundamental work, I. Prihozhyn tackles the approach of Sarl Rubino, who draws attention to the philosophical principle of the performance of any activity, including assessment. The scientist emphasizes that when considering any subject, one should not strive for more accuracy than the nature of the subject permits [13]. These provisions can be effectively applied to solving current problems in the field of information security. Various materials on the actual problems of counteraction to the "zero-day" threats are at the disposal of the users. The key idea is that "any processes managed by people are unreliable". Therefore, the largest providers of the information tools insist on the continuous improvement of the technical means of information protection, namely Check Point Threat Emulation and Qualys Continuous Monitoring [15-18]. Utilization of these mechanisms of assessing the protection level is commercially advantageous but very far from the solution of a well-known technical problem.

Mostly, scientists define an organization's information security audit as a systematic and documented process for conducting, objective evaluating and comparing audit results.

Currently, there are three basic approaches to analyzing the results of the audit of

information security that differ significantly from each other.

The first approach is the most difficult and deals with risk analysis. Having applied the risk analysis, the auditor will analyze the set of security requirements, the most fully consider the features of the information system and possible threats to its security. This method is the most difficult and requires a sufficiently high qualification of the auditor. The suggested method of risk analysis and its suitability for a particular object of informatization greatly influences the audit results in this case.

The second approach is most commonly used and involves the implementation of the provisions of information security standards. These standards involve the principal requirements concerning the security of information systems and objects. When carrying out an audit, it is necessary to single out the appropriate (sufficient) set of requirements of the standard that meet the regulatory principles of the normative documents regarding information security at the specific site of informatization. Since this method is the most simple and available, it is most often used in practice.

The third approach is the most effective and involves combining the two above methods.

Unfortunately, all currently available techniques are predominantly foreign and only allow for a qualitative assessment of information security (Guide to BS 7799 Risk assessment and risk management- DISC, PD 3002, 1998; Guide to BS 7799 auditing - DISC, PD 3004), and the standards themselves allow us to assess only the state of information security management, not the level of security of the information system [19].

The incommensurability of data as a tool for protecting against both threats to information security and their source is a serious impediment when analyzing technical and programmatic components of an information system, analyzing the security of information resources, and analyzing personal. This demands the unification of the data indicators in conducting an information security audit.

The paper offers the methodology that enables the auditor to generalize the evaluations of the individual components of information security by determining the probability of a successful attack from the source of threat, that is, assessing the potential threat consequences, the reliability of protection against it, the probability of realizing the threat and the level of possible damage.

Data in table 3 demonstrate the threshold effect regarding overpassing the protection level. The critical effect index is an allowable algebraic difference between adjacent gradients[20, 21].

The purpose of the phase is to determine the maximum level of information security risk in the result of a successful attack from the i-source in relation to j- vulnerability.

A relatively easy way to obtain risk assessment for each of the threat-vulnerability pairs is to multiply the probability of realizing the threat and the damage from the successful implementation of the threat, with the subsequent ranking of the resulting indexes.

Table 3

Matrix of potential threat analysis and protection effectiveness [based on 18-21]

Protection effectiveness Z (i, j)	Potential of threat U (i, j)				
	1	2	3	4	5
0 (no protection)	1	2	3	4	5
1	0	1	2	3	4
2	0	0	1	2	3
3	0	0	0	1	2
4	0	0	0	0	1
5	0	0	0	0	0

Table 4 demonstrates the results of multiplying the indexes of P (i, j) and further ranking of the obtained data regarding the probability level of the threat realization and damage from the successful implementation of the threat (the figures are the result of the multiplication of P (i, j) and S (i, j), and the letter indexes represent the result of the ranking).

Table 4

The matrix of the probability level of the threat realization / damage from the threat realization[based on 18-21]

Damage from the realization of the threat S (i, j)	probability level of the threat realization (i, j)				
	1 (L)	2 (L)	3 (A)	4 (A)	5 (H)
1	1 (L)	2 (L)	3 (L)	4 (A)	5 (A)
2	2 (L)	4 (L)	6 (A)	8 (H)	10 (H)
3	3 (L)	6 (A)	9 (H)	12 (H)	15 (C)
4	4 (A)	8 (H)	12 (H)	16 (C)	20 (C)
5	5 (A)	10 (H)	15 (C)	20 (C)	25 (VH)

L - low (corresponds to the indexes from 1 to 3);
A - average (from 4 to 6);
H - high (from 8 to 12);
C - critical (from 15 to 20);
VH - very high (from 21 to 25).

In spite of the fact that there is no sustainable definition of the notion security auditing, it can be interpreted as a process of collecting and analyzing information about the information systems security necessary for further qualitative or quantitative assessment of the level of their protection against hacker attacks [21]

The suggested method will have a positive effect under the condition of ongoing conduct of the following types of information security audit:

- expert safety audit, in the process of which deficiencies in the system of information

activities are identified on the basis of the experience of the experts involved in the process of information security inspection;

- assessment of the information system security compliance with the recommendations of the international standard ISO 17799 and the requirements of the guiding documents;

- instrumental analysis of the information system security, aimed at detecting and eliminating vulnerabilities of hardware and software system;

- the overall audit, which includes all the above forms of inspection [22].

Conclusions. The findings of this study prove that the security auditing is one of the most effective measures that can increase the level of information security of the business entities. The paper presents the matrix methodology for conducting an information security audit taking into account existing standards and theoretical framework of information security management. This enables the auditor to generalize the indicators of all the components of information security by compiling the data obtained through analysis of the technical and programmatic components of the information system, analysis of the information resources security, analyzing personnel and the sources of threats to information security including protection mechanisms.

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MARKET ASPECTS OF HIGHER EDUCATION

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Annotation. *For a long period of time, higher education was considered to be a public good. In the early 70's of the twentieth century, there emerged an idea that higher education was a commodity. This can be explained by the country's economic openness and reinforcement of liberalism. Taking into account the importance of higher education for strengthening the economic development of Ukraine, which is based on knowledge, the definition of the essence of higher education is topical.*

Key words: *higher education, public good, commodity, non-exclusivity, non-competitiveness, neoliberalism.*

Traditionally, education has long been seen as a public good, creating a set of external effects that provide a benefit not just for the students but also for society as a whole.

However, in recent years, the development of international legislation on trade in services has called into question the well-established idea that higher education is a public good. The idea of the need to legitimize the sale and purchase of education as a commodity intended for trade is increasingly spreading. [1, p.450]

The emergence of the international trade in educational services and globalization processes have only given credence to the idea that education is a commodity. This found its expression mostly in Eastern Europe, as well as in most English-speaking countries, the Organization for Economic Cooperation and Development (OECD) and China. [2, p. 131]

Higher education is subjected to the significant impact of both national and international trade, their interests being represented in the World Trade Organization (WTO) and the General Agreement on Trade in Services (GATS), the institutions established beyond the United Nations system. This has led to higher education being seen as a private commodity influenced by national and international markets. [1, p.450]

Studies have been conducted to provide an answer to the question whether higher education is a product or a public good. They showed that there are at least four reasons for discrepancies in public / private distinctions in higher education and in other fields.

First, the public / private categorical apparatus is widely used in the activity areas (public and external sectors), financing sources (state, household or private enterprise), and the nature of the activity itself. Since the central focus of the study is higher education,

one should distinguish between social / private in terms of the social nature of learning activities, and the understanding of the "public" - as the public sector.

Secondly, the difference between public / private in different countries of the world is different depending on political culture. There are different views and practices of the "public/social", "private", "society" and "state" in the Nordic countries, in the German ordoliberalism, Anglo-American society and Chinese civilization tradition with its strong family structure. The public / private balance of expenditure is very different in national systems that are often similar in other respects, and it reflects a variety of assumptions about the contribution and responsibilities of the state, families and students in higher education. [3, p.2]

Thirdly, social / private concepts differ in social sciences, from economics to different trends in political and communication theory.

Finally, there has been a steady and dominant perception of the notion of public good or public interest in Anglo-American social science over the past half of the century, and it partially overshadowed the public dimension in higher education and other sectors.

Neoliberalism introduced a new regime of regulation or the form of government in the field of higher education. To understand this, one must understand that the liberal welfare regime maintains fundamentally different assumptions at the level of politics and economic theory, as well as at the level of philosophy. The central defining feature of the new mark of neoliberalism is the revival of many provisions of classical liberalism, especially classical economic liberalism. Basic assumptions of neoliberalism are as follows:

- Self-interested person: people are viewed as economically interested actors. From this perspective, the person was presented as a rational optimizer and the best judge of their own interests and needs;

- Free market economy: the best way to distribute resources and opportunities is through the market. The market is the most efficient and morally fair mechanism;

- A commitment to non-interference: a free market is a self-regulatory order, it regulates itself better than a state or any other external force. In this aspect neoliberals demonstrate a clear distrust of the state power and seek to limit it within the framework of a negative concept, limiting its role in protecting personal rights;

- Free trade commitments: cancellation of tariffs or subsidies or any other form of state protection or support, as well as support of a floating exchange rate and an "open" economy. [4, p.314]

Thus, Anglo-American policy in higher education focuses on private benefits for students and graduates. This mainly concerns higher earnings, individual choices and consumer satisfaction. The emphasis on private benefits, which is consistent to a greater extent with a marketing approach, has encompassed many higher educational institutions and is used to substantiate a steady increase in tuition fees. The social aspect is defined narrowly and in terms of a market economy, in which individual preferences constitute a priority. Thus, the main social role of higher educational institutions is seen as their contribution to profitability, innovation and economic growth. Neoliberal governments

have no desire to identify, control, measure (where possible), and regulate the collective effects of education such as social literacy. [3, p.3]

In social policy, the contribution of the higher educational institutions to social justice is considered to be core. Other social contributions are often considered as a side effect of the benefits of graduating. Such an approach reduces the fiscal burden of the state, but also reduces the share of social institutions and increases the risk of not providing public goods. [3, p.3]

In The Pure Theory of Public Expenditure, Paul Samuelson defined the concept of the public and private sector, which is dominant in economic policy today. Public goods are defined as non-competitive and / or non-exclusive. The goods, when they are defined as non-competitive, are consumed by any number of people and are not exhausted. The benefits are non-exclusive when access to them cannot be limited to individual buyers. Private goods are neither non-competitive, nor non-exclusive. They can be produced, packaged and marketed as individualized products in the markets. Public goods and partly public goods are produced unprofitably and require state funding or charitable support. They do not necessarily require full state funding, but may be produced in public or private institutions. [5, p.387-389]

P. Samuelson’s concept of public and private goods has created the basis for the following variations, such as: the benefits of shared use, competitive but not excluded; "club goods", exclusive, but not competitive; and "customs goods" that are accessible to all but specific groups of the population and are non-competitive within the group. Public goods are goods that are produced in both the private and public sectors, which are competitive and exclusive, but are funded by the state, since otherwise there will be a shortage of these goods. Despite rather generalized conditions, the definition of P. Samuelson is not universal, since it cannot be applied to all societies, but rather embodies the norms of a capitalist society that corresponds to the idea of an "institutional world".

Among the capitalist societies, John Locke's or Adam Smith's concept of the limited liberal state and the "zero sum" between the private and social are most commonplace. In such societies, state economic entities view private business as the default manufacturer, except in cases of market failure with respect to the production of important goods. This political approach increases the opportunities for trade and capital accumulation, while providing a simple distribution of funding for such fields as higher education and research. The government finances the goods to the extent that the market does not. Samuelson's definition of the public / private correctly defines the market failure as a basis for fixing the minimum required level of public spending on education and research. However, its definition is simplified and has certain gaps.

First, this definition is separated from the historical events. Whether the good is public or private is determined in accordance with the nature of this good: universal, unchangeable and not context-related. It is right sometimes, but not always,. This is right in relation to sunlight, which is always a public good. But this is wrong when the character of the good is determined by politics or state system, as is the case with higher education. [3, p.5]

The second problem is the assumption of a "zero sum". This is the idea that if the good is not social, it should be private, and vice versa. Under certain circumstances, public goods and private goods are not goods substitutes, but rather complementary. For example, the fundamental research of the university, together with its links with commercial and non-profit organizations, generates both public goods and private goods directly and indirectly. The policy differs from the fact that higher educational institutions are funded on the basis of a zero-sum distribution between public and private costs and benefits, as in the UK; or higher educational institutions are funded by taxation as a universal service with private benefits, as in the Nordic countries. A zero sum or a positive sum is a political choice.

The third problem is that the definition of P. Samuelson does not solve the majority of problems associated with the public goods, which, as a rule, go beyond the boundaries of the economy, are hardly limited, investigated, measured and evaluated under shadow prices. The naturalistic formula by Samuelson is not able to clearly observe the regulatory aspects. The economic definition of public goods by P. Samuelson differs according to the standard assumptions of the economists. Neoliberal economists tend to mitigate the market failure for collective goods, or they assume that private investment will generate the necessary public benefits with the help of the spillover effect. Social democrats and endogenous growth theorists are talking about increasing potential of public goods and public investment.

All three of the mentioned problems are correlated. Despite the definition of P. Samuelson, products manufactured on the market, and non-market goods are not the two sides of the same coin. They do not have a common ontology. Market public goods should be viable in the current market of transactions, and state social goods should be politically viable, they are created under the influence of many factors, in addition to the market failure. We can make a conclusion that the definition introduced by P. Samuelson is too brief. [3, p.6]

John Dewey gave the most influential definition in political science about the distinction between the public and the private as state and non-state. In Dewey's book "Society and its Problems," Dewey notes that while most social operations fall into the private sphere, some concepts are perceived as social, because they have a broad "public interest" and are turned towards society. A social transaction can become "social" when it has indirect consequences for others, then people outside the group will be directly involved in the transaction. According to Samuelson, higher education is only a public good by its nature, if it cannot be provided by the market. For Dewey, any or all aspects of higher education can be both public or private. Potentially education or research have a comprehensive impact when they affect a sufficient number of people. Even privately owned commercial higher education is a matter of public interest if people and the government determine what it should be. [3, p.8-10]

In order to answer the question of the essence of higher education from the point of view of the topic of this study, the features of higher education, which can be attributed to both the public good and the commodity, were analyzed.

Thus, what features of higher education allow to assert that it pertains to the public good? To answer this question, it is advisable to analyze the main features of public goods once again.

Economic thought determines public goods as being non-exclusive and non-competitive. Non-exclusivity means that such goods cannot be provided exclusively to someone and cannot be excluded from consumption. Non-competition means that the consumption of goods by some people does not reduce its consumption by others. Public goods create a large number of externalities. They are accessible to everyone alike; the marginal utility is equal, and the marginal costs for the production of the public good are zero. It is also a commodity of collective consumption. Economists share public goods that strictly satisfy all of the above conditions as pure public goods, and other public goods that do not necessarily fully satisfy all the conditions, are treated as semi-or quasi-public goods. [6] Moreover, if the benefits of public goods are geographically limited, they are called local public goods, and public goods, the benefits of which are aimed at the whole world, are called global or international public goods. Private goods are different, they do not satisfy any of these conditions.

An important feature of public goods is that their production is funded by the state at the expense of total incomes and does not necessarily rely on prices or any other revenue from users. Therefore, the personal or market provision of public goods is impossible, and even if it is possible, it is ineffective. In addition, public goods are generally available to everyone and they are not subject to competition. In fact, ;/’.,/.,’”L?public goods that are subject to economy at scale are better provided by the state as a monopoly than by many producers. [1, p.451] If a product or service can be defined as a public one, then it must be "accessible to everyone" and nobody can use them because of the lack of resources. In practice, the situation is different: access to education depends on the place of residence, the size of the income and, ultimately, the mental capacity, which, in turn, shows that higher education is a commodity.

Some scholars argue that higher education cannot be regarded as a public good, since it does not satisfy one of the first two demands, namely, non-exclusivity and non-competitiveness. [1, p.452]

J. Stiglitz argued that knowledge is a public good since higher education and research fulfill all characteristics of the public good. For example, the theorem is non-exclusive, since as soon as it is published, no one can be excluded from reading and using it, and non-competitive, since the use of the theorem will not affect the use of it by others. It is impossible for the knowledge to become a commodity, because the seller does not lose it by selling it. [7, p.308-309] However, such an argument is based on a mistaken perception of the nature of property. Ownership is not a thing, but rather a set of rights, a social institution. Moreover, in the modern era, it makes no sense to speak of property as a social institution, not to mention the legislative nature of the nation-states. In the modern sense, there is no property without nation-states. [8, p.402] It is worth noting that access to many scientific treasures is limited by copyright and patent laws, a free product accessible to everyone becomes something expensive or inaccessible because of

geographic location, providing rent for copyright owners or patents. [2, p. 137]

As J.Styglitz noted, there are two critical properties of public goods: it is impractical to allocate public goods, and there is no desire to make such an allocation. Although it is appropriate to distribute access to higher education, it is impossible to distribute the benefits of higher education. Eliminating the poor from education consumption will lead to loss of capital and efficiency in the economy. Thus, education, namely higher education, satisfies all three main features of public goods: non-exclusivity, non-competitiveness and the creation of external influences. Other public benefit functions, such as "free-riders", are also relevant to education. Higher education is also associated with asymmetric information, especially as regards incomplete information about quality. In addition, higher education institutions have several goals, and they are not only economically viable. They also produce various output products, some of which are tangible, and many others are not. [1, p.452]

Traditionally, the functions of higher education constitute the basis of life of the societies. First and foremost - higher education helps in creation, improvement, absorption and dissemination of knowledge through research and education. It has been established long ago that universities are a cradle of ideas, innovations and development, and gradually they become a reserve of knowledge. Secondly, higher education promotes the rapid industrialization of the economy by providing human resources with professional, technical and managerial skills. In the context of transforming society into knowledge society, higher education provides not only skilled workers but also workers prepared for the new knowledge that is necessary for the rapid growth of the economy. [9 p.21-22] The supporters of the theories of endogenous economic growth argue that the groups of well-educated people who work together are more productive rather then if they all worked individually with less educated people. E-mail and the Internet are an example of this. Knowledge, which is free to access, has a great influence on overall productivity. [10] Thirdly, universities are institutions that help shape the person's character and morals; they embody ethical and moral values, formulate well-behaved habits and make possible changes in the views that are necessary for the socialization of individuals, encourage the modernization and general transformation of society through protection and strengthening of public values. Fourthly, higher education also helps in the formation of a strong nation-state, promotes the development of democracy by educating active citizens who participate in the civil, political, social, cultural and economic activities of a society that understands, interprets, preserves, strengthens and promotes national, regional, international culture and history, in the context of cultural pluralism and diversity. It also has the potential to produce high-level social and political leaders. [9, p. 21-22] At the very end, recent studies have revealed many non-monetary benefits from higher education: longer life expectancy; reducing alcohol and tobacco consumption; less probability of obesity; more likely to be involved in prophylactic health care; better mental health; better general health; greater satisfaction with life; less crime; greater propensity to vote, volunteering, trust, and tolerance. Almost all of these provides wider social and individual benefits. [11, p.9]

In addition, higher education promotes the development and improvement of education at all levels and allows people to enjoy the expansion of the "life of mind", offering wider cultural and political benefits, and thus serving the public interest. An important component of public interest in higher education is its role in creating a meritocratic society capable of educating the best political leaders, civil servants, doctors, teachers, lawyers, engineers, and business and community leaders at the same time. [12, p. 37-39]

However, the study of the essence of higher education showed that there is a rapid change in the paradigm of higher education. Even in economically prosperous countries, higher education systems are in a state of strong financial constraints: on the one hand, an increasing number of students, and a chronic lack of public funds on the other. In recent years, in most countries, this has led to serious consequences, caused by the reduction of the state allocation of higher educational institutions, respectively, and the cost per student. [1, p.456]

Externally, universities are increasingly approaching private governance models and public sector corporations. The structural subdivisions of universities turn into centers of financial responsibility, whose heads are executives coming from the private or public sectors. Regardless of the different views on the advantages and disadvantages of such changes, transforming education into goods is a reality in which scientists have to live.

Proponents of education modification movement argue that this process will transform higher education into a more flexible and efficient institute. Expansion of the market in the audience will provide better value and quality, and the university sector will become more efficient and more responsive to the needs of society, economy, students and parents. The political direction of creating a market for higher education is fundamentally ideological. However, the transformation of education into goods does not necessarily lead to the creation of a market for the sale and purchase of academic education. Indeed, it is not always clear what is being bought and sold. In this way, conditions are created for the institutions to compete for resources and funding. It is important to understand that the transformation of education into goods is equally a political, ideological process as an economic phenomenon. For example, governments often contribute to a well-defined policy through a market economy. This tendency is not a triumph of a free market economy. Indeed, it can be argued that the market-based trade in education has led not to a decrease but to increased interference and micro-management of university life. Governments are desperately mobilizing students and their parents to choose a university under pressure from the market and marketing tools. According to the logic of the market, the customer is always right, so universities are guided by the interests of students, and not the academic community. [13, p. 1-3]

Another important factor contributing to a radical change in thinking about the nature and role of higher education is the use of neoliberal economic policies for stabilization, structural adjustment and globalization associated with the International Monetary Fund and the World Bank. Neoliberalism, as well as liberal neutrality, is insolvent and extremely inadequate in the management of social practices, especially in the case of

higher education. Such a policy undermines the role of the state and involves eliminating the influence of the state, as well as the liberalization and privatization of several social and economic sectors, including higher education and even social security programs. This policy also clearly contributes to the growing role of markets. The treatment of higher education as a product received great support from such politicians and organizations. Liberal policies have been introduced in almost all developing countries, and even in many developed countries, where there is reasonable justification for reducing public funding for higher education. Higher education, as a commodity of international trade, is capable of generating a huge amount of profits for exporters of education. [1, p.456]

Many governments of exporting countries have encouraged higher education negotiations under the GATS and WTO, since trade in higher education is essentially seen as an important source of income for universities, thus reducing the obligation for governments to allocate most of their resources. For example, even some of the best universities in the world, such as Oxford and Cambridge, seen as the gold standard in higher education, are involved in business, trading and selling their degrees to students abroad. [1, p.457] Creating the General Agreement on Trade in Services (GATS) reflects the formalization of the market processes, driven by the growing need for independence of public institutions and the procedures for international trade in services. The GATS covers all international services, including education. Within the education sector, GATS covers the following categories of education services: primary, secondary, higher, adult and "other". GATS education trade takes place in four modes: cross-border supply of services (where consumers remain within their own country); consumption abroad (where consumers cross the border); the commercial presence of a provider in another country (institutional mobility); the presence of persons in another country (staff mobility). [14, p.9] The GATS considers public goods as commercial goods and even global public goods as global commodities intended for trade and profit. It is equitable to fear that the nature of the benefits of general consumption will be revised and that public education will be a commodity for which GATS will provide a political and legal basis for deregulation and privatization. [14, p.58] The transformation of education into commodities leads to a mass privatization of education that increases tuition fees and growing inequality because of the access restrictions. Moreover, as the driving forces of the national state and state control over higher education are reduced, the ability to plan the education sector for national needs will completely disappear, as education will be formed in the markets to meet the needs of the market, and international trade will prepare people to meet the requirements of the labor markets of the developed countries. [14, p.62] Entry to the domestic market of foreign private institutions may also have a negative impact on domestic government institutions, especially in developing countries, which are not necessarily competitive and not fully oriented to the needs of the market and often serve the national interests ofmore influential countries. [14, p.65]

As a rule, it is stated that international trade in higher education is beneficial both for exporting countries and for importers. Importing countries have access to a high-quality higher education system, and exporting countries are gaining economic benefits,

in addition to receiving academic payments. However, as practice shows, developing countries have both economic and academic losses, whereas rich countries can only have economic benefits.

Individuals with average and higher incomes are more likely to profit from the state financing of higher education rather than low-income groups, thereby exacerbating uneven distribution. Although this argument is true to a certain extent, the situation in developing countries is changing rapidly: access to higher education is no longer limited to middle-level groups, and the level of engagement of poor social and economic groups is increasing, albeit slowly. On the other hand, the adoption of neoliberal arguments on state funding for higher education and the withdrawal of state will reduce the participation of socio-economically weak sectors of society in higher education and will further emphasize their inequality in accessing higher education services. [1, p.459] The transformation of education into goods and its internationalization leads to the brain drain and a serious shortage of skilled labor in developing countries. Higher tuition fees paid by foreign students, relatively low wages in their home countries, and better job markets in developed countries will even more potentially contribute to the brain drain. [14, p.65]

With regard to academic research at universities, there is a steady increase in private interests. Knowledge, which is essentially non-exclusive and non-competitive, has been privatized. An argument for the privatization of codified knowledge is the possibility of obtaining high benefits, which in the future encourages more investment in research and creativity. [2, p.139] In a broader sense, the transformation of knowledge into goods in the field of higher education is one example of the "second movement of the corpus". The first movement began in England in the fifteenth century, and this is especially true in the process of moving away from the jointly-owned land and turning it into private property in different ways and means of the state-involvement. In the center of the "second movement of the corpus" knowledge (instead of land) is regarded as a private commodity that is subject to commodity registration. [15 p.33-34] Reflecting this, Radder implies that the redeeming of academic research can be seen as part of the "economization, or economic instrumentalisation, human activity and institutions, or even the goals of the social subsystem. "[8, p.400]

Thus, it remains ambiguous whether higher education is a public good or a commodity. Studying at high school is usually a combination of both. Public goods include individual non-market benefits and acquired knowledge that is not excluded or non-competitive. However, when studying creates additional value, it acquires a new feature, which is competition. Apart from that, admission to higher educational institutions with high demand is exclusive. This creates prerequisites for higher education market emergence. The transformation of higher education into goods is caused by the need for institutional independence of universities, as a consequence of neoliberal policies, trade agreements, and bolstered up competition.

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ORGANIZATIONAL MECHANISM OF MANAGEMENT OF THE LABOR MARKET

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Annotation. *The article stresses the need to create a comprehensive mechanism for regulating the labor market, the components of such an approach are identified.*

Key words: *labor market, labor market regulation, the State Employment Service of Ukraine, modernization of the mechanism of provision of social services, comprehensive evaluation of the efficiency.*

Introdaction. Modern challenges and threats to the economic growth of Ukraine put new tasks in the formation of the national economy structure and put forward new objectives to the processes of formation and regulation of the labor market. Emerging economic reforms in the state focus on regulating the scope of official unemployment through the promotion of inefficient employment. Until now, a comprehensive mechanism for regulating the labor market has not been established as a coordinated interaction of state, contractual regulation and self-regulation of the labor market based on the best world standards and features of complex domestic socio-economic processes.

Legal and organizational and economic mechanism as components of a comprehensive mechanism for regulating of the labor market is researched in the works of Y. Marshavin. In the opinion of the scientist, the goal of the labor market regulating is ensuring full, productive and freely chosen employment. It is necessary to solve the problems of reloading of economic policy with preservation of existing workplaces and developing new effective workplaces. The state has to provide conditions for the capture of citizens by high-income professions; additional employment opportunities to low-competitive groups of the population and has to reconstruct the material security system for the unemployed, which will provide more incentives for job search [1, p. 216-217]. There are other approaches that differ only by separate differences in the interpretation of the content of the organizational and economic mechanism of the labor market regulation.

According to the system approach, the organizational and economic mechanism includes a set of simple and complex interconnected and complementary systems, processes, elements, forms, methods that determines the content, the order of development and the function of any type of work, processes or objects in the field of human activity. For the minimum cost of resources and time they allow to meet the requirements of innovation policy, the market demand and supply of the market, trends in the development of science, technology, technology, organization, economy and other aspects of the development of production to the national international and international

levels [2, p. 126].

The organizational and management mechanism is the least studied component of the integrated mechanism of regulation of the labor market. Through its leverage of influence are implemented the main managerial decisions that determine the direction of the labor market at the state, territorial and production levels.

Analisys of recent researches and publications. Representatives of classical scientific schools have long paid attention to the justification of the problems of coordinating the interaction of market and state regulators of socio-economic relations, including on the labor market. Modern scholars are studying the peculiarities of these issues. Problems of the mechanism of functioning and the principles of regulation of the labor market in the theoretical and applied aspects are considered in the scientific works by Y. Marshavin. Such researchers as V. Heyets [3, p. 25-76], B. Danylyshyn [4, p. 276-292], E. Libanova [5, p. 4-19], V. Tarasevich [6, p. 79-98] are improving mechanisms and priorities of state regulation of labor market.

Goalsetting. Therefore, the perpose of this study is to generalize theoretical and methodological principles of integrated labor market regulation, to substantiate the main directions of the organizational and managerial mechanism of the labor market regulation and the expected results of its application.

Presentation of basic material of the research. It is possible to determine the main directions of the organizational and managerial mechanism of the labor market regulation based on the findings of the research on a general assessment of the state and problems of labor market regulation. The main directions are:

1) the reformation of the employment service in accordance with the provisions on the State Employment Service of Ukraine and the Regulations of its departments to meet the needs of clients;

2) comprehensive evaluation of the efficiency of the State employment service;

3) modernization of the mechanism of provision of social services;

4) creation of a modern organizational mechanism for active support in the labor market of internally displaced persons [7, c. 153-158].

The need to modernize the employment service is a response to the current challenges of the labor market. The war in eastern Ukraine and the crisis caused by it provoke a decline in economic activity, which leads to an increase in unemployment.

To date, the reorganization of the employment service has been completed, which has allowed increasing the number of employees who provide social services directly in communities.

The main tasks of the state employment service of Ukraine at the present stage are:

- development of active employment promotion programs;
- increasing the competitiveness of the unemployed in the labor market;
- targeted help in the employment of socially disadvantaged categories of the population;
- the introduction of new partnerships with employers, and encouraging them to create new jobs.

The Career Advisor Institute has been introduced since January 2019. The Career Advisor is the individual consultants of jobseekers and registered unemployed persons in job search, career planning and increased competitiveness in the labor market, including through engagement in vocational training. They provide support for the unemployed from the date of referral to the employment center to the fact of employment [8].

It is extremely important to choose an effective management model. The State employment service of Ukraine uses a linear functional management structure. This structure clearly defines:

- functions and responsibilities,
- powers and responsibilities at different levels,
- coordination of the activities of all structural elements and, in general, ensures the fulfillment of tasks related to its participation in the implementation of the state employment policies,
- donation of quality social services to the population and employers.

However, some suggestions can be made to improve its performance.

The Regulation of the State Employment Service of Ukraine provides the use of new approaches for the recruitment of vacancies to the employer (recruiting basis) and the selection of suitable work for the person. The specialists of the State Employment Service of Ukraine master the new skills of customer service through the implementation of cross-training internships directly at workplaces, advanced training, and self-education. A large amount of diverse information is being prepared for requests from local authorities and for submission to regional employment centers. All this information is being prepared by affiliates. However, there are limited staff numbers in the affiliates.

Therefore, it is appropriate to suggest lifting the forecast-analytical activity and most of the formal-procedural component of the work at the regional level, namely:

- the formation of statistical information, which in most cases can be calculated using standard templates and algorithms EIAAS.NET;
- the constant technological control over the correctness of the decisions made by specialists.

These suggestions are relevant because the current information and analytical system and the main standards of services provided by technology are reliable tools for solving these problems.

According to the Regulation of the State Employment Service of Ukraine, the provision of qualitative recruitment of personnel on the orders of employers comes to the fore. A leading role in the staffing of the employment service by highly qualified specialists depends on managers of all levels who must have a high managerial culture. This refers to almost the entire complex of human resources management:

- human resource planning,
- staffing,
- organization of labor,
- division of rights and functional responsibilities.

It is important to take into account the specifics of the employment service. it is

advisable to appoint senior specialists who have passed the professional path in the employment service from a leading specialist to senior positions. In this case, it is about managing positions at the basic, regional and state levels. Such specialists have a comprehensive experience of practical work, knowledge of all areas of activity of the employment center, the use of the necessary competences in daily work. Such erudition allows managers to organize the whole staff of the employment center for the effective implementation of the tasks, which in turn provides the best result of joint efforts to provide quality targeted services to its clients.

The following question is urgent before the State employment service: the choice of the optimal forms and methods of customer service, the technological aspects of the combination of active and passive measures to promote the employment of jobseekers and the selection of employees to employers. In this context, it is necessary not so much to control and analyze the result of the services provided, how much the organization's quality and the performance of the technological processes of creating these services.

Certain information is essential for the adoption of objective and optimal managerial decisions. The reliable, truthful and timely organizational and managerial information is needed, including information obtained through the evaluation of the effectiveness of the State Employment Service of Ukraine. The development and application of objective criteria for evaluating the activity of the state employment service is relevant.

Methodological approaches to improving the system of criteria and indicators for evaluating the effectiveness of the State Employment Service and its structural units should be based on a clear strategy and priorities of the State Employment Service at a specific stage of its activity. Such an assessment should be carried out in a complex manner, taking into account global organizational and managerial experience, through an organic combination of economic and organizational and managerial efficiency.

All regional and city-center employment centers differ in terms of the conditions in which they operate, namely, the availability of vacancies, the structure of the economy, the quantitative ratio of jobseekers and job vacancies, the load per employee of the employment center. There are two approaches to taking into account the conditions in which employment centers operate.

According to the first approach, establish special (balancing) coefficients reflecting the complexity of the conditions in which each employment center operates, for example, in comparison with a reference region, city or region defined as the basis for comparison. These balancing coefficients should be determined by the expert estimation method.

The second approach is to assign each employment center to one special group, formed on the basis of the proximity of conditions, but which fundamentally differ from other groups. Such groups, for example, at the regional level, can be formed taking into account the climatic conditions, features of the economic structure, traditions, which determine the behavior of workers, in particular concerning internal and external migration, etc. In this case, comparison of employment centers is carried out only within the framework of homogeneous groups. This approach was taken as a basis in the approved integrated evaluation system.

To obtain the result of the evaluation, an integral indicator of the evaluation of the employment center is determined, and the method of expert assessments of the weight of each indicator in the overall assessment is used.

At the stage of forming a list of indicators, all indicators are divided into stimulators and stimulants. The connection between the integral index and the indicator-stimulator is direct, between the integral index and the indicator-de-stimulator, is inverse. That is, indicators-stimulants reflect positive trends in the work of the State Employment Service of Ukraine, while indicators-disinfectants - are negative.

Since the performance indicators of the activity of the Employment Center are diverse (characterizing different properties of the object and having different units of measurement), and also characterizing both positive and negative aspects of their activity, there is a need to bring them to one basis, using the standardization procedure.

The standardization of indicators is carried out according to the following formulas:

1) for indicators of stimuli, the growth of which contributes to the increase of the integral indicator of the success of the employment center:

$$z_{ij} = (x_{ij} - x_{min}) / (x_{max} - x_{min})$$

for indicators of disinfestation, the growth of which leads to a decrease in the integral indicator of the success of the employment center:

$$z_{ij} = (x_{max} - x_{ij}) / (x_{max} - x_{min})$$

where:

Zij - the standardized y-th indicator y in the j-th region;

Xij - the value of the y-th indicator y in the j-th region;

Xmin - the minimum value of the y-th indicator y of the aggregate of regions;

Xmax - the maximum value of the y-th indicator y of the aggregate of regions.

The formed list of indicators is evaluated by experts. The results obtained during the expert survey are generalized: the average expert estimation for each indicator is calculated according to the formula:

$$a_i = \frac{\sum_{k=1}^{m} e_{im}}{m},$$

where:

ai - average expert estimation for the i-th indicator;

eim - estimation of the i-th indicator by the k-m expert;

m - number of experts;

n - number of indicators.

For the determination of weight coefficients it is necessary to divide the average expert estimation of each indicator by the sum of average expert estimates:

$$w_i = \frac{a_i}{\sum_{i=1}^{n} a_i}$$

where:

Wi – weight coefficient of the i-th indicator.

The total amount of weighting coefficients according to the results of the survey should be equal to one. The integral indicator (general estimation) of the performance of the Employment Center, taking into account the weighting coefficients of indicators, is reflected through the weighted average by the formula:

$$I_j = \frac{\sum_{i=1}^{21} z_i w_i}{\sum_{i=1}^{21} w_i}$$

where:

Ij - integral indicator of the performance of activity in the j-th region.

Based on the results of the integral indicators, the place in the cluster is assigned to each employment center: the unit that received the largest integral estimate gets first place, and the unit that received the lowest integral estimate is the last one.

At the current stage, the clusterization of the regions was carried out according to the criterion of the number of economically active population on the example of the Chernivtsi Oblast Employment Service.

According to the system introduced, Chernivtsi Oblast Employment Service was assigned to the third cluster. The distribution of economically active population in the areas included in this cluster is presented in Table 1.

The calculation of the integral estimation was performed using weighting factors and values of stimulants (destimulants). Study period: January-November 2018. Based on the clustering of district and city affiliates of the Chernivtsi Regional Employment Center, the economic status of the districts was taken into account and their territorial location was taken into the regional center. After conducting calculations according to the methodological recommendations, the places of the studied employment centers in clusters were determined.

The evaluation process of the effectiveness of district and city affiliates can be represented as a chain consisting of several units (Figure 1). After evaluation, those who have allowed the largest deviations from the average values in the cluster should be identified. The forms, methods and technologies of the regional employment centers,

rayon and city affiliates, who have achieved the highest results, are described, their experience is analyzed and recommendations on its dissemination are developed.

Table 1

Economically active population of 3rd cluster in 2018

Regions (Oblasts)	Economically active population, thous. of people	% to the total population of the correspond. age	Occupied population, thous. of people	% to the total population of the correspond. age	Unemployed population, thous. of people	% to the total population of the correspond. age
Volyn	437,6	58,5	389,0	52,0	48,6	11,1
Transcarpathian	564,4	61,1	510,5	55,2	53,9	9,5
Ivano-Frankivsk	600,0	58,9	547,7	53,8	52,3	8,7
Kirovograd	435,7	60,8	384,5	53,7	51,2	11,8
Rivne	540,5	64,9	483,8	58,1	56,7	10,5
Sumy	505,5	59,7	450,1	53,1	55,5	11,0
Ternopil	456,3	58,0	399,9	50,8	56,4	12,4
Chernivtsi	396,6	59,3	358,1	53,5	38,5	9,7
Chernihiv	477,3	62,1	420,8	54,7	56,5	11,8

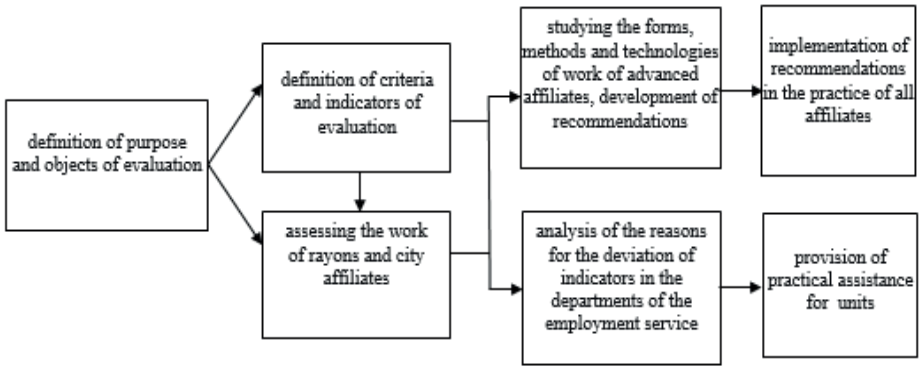

Fig. 1. Structural-logical scheme of estimation of efficiency of district and city affiliates

The presented methodology for assessing of the effectiveness of district and city affiliates leaves out of the attention the mechanism of provided social services, the degree of satisfaction of jobseekers and employers. The professionalism and competence of the employment center staff, their active and creative position are not taken into account.

The problem of creating modern mechanisms for managing social services in the field of employment is due to the need to rethink the role of the SSSU and its impact on the labor market and employment. To solve this problem, it is necessary to rethink the management of social services, which is focused on different management models (situational, operational, strategic, anti-crisis, innovative). The definition of management

priorities at the present time and strategic guidelines for its development up to 2020 will require, within the framework of these models, modernization of the mechanisms for managing social services, which will contribute to the adaptability of its system to the challenges and threats of the present [9, c. 80-85].

Conclutions. The conducted researches of the organizational mechanism of managerial of the labor market have allowed to expand the components of this mechanism and to identify their impact on the labor market, to propose a methodology for assessing each component, the tools of influence as a methodology of research and address the multifaceted aspects of regulation of the labor market from organizational and managerial positions.

The prospects for further research are to improve the complex mechanism of the labor market regulation: legal and normative, organizational, economic and and managerial, based on the use of all regulatory processes of the labor market mechanism in the complex through the formation of socially oriented economic relations and taking into account world globalization processes.

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IMPLEMENTATION OF INTERACTIVE - MARKETING IN HOTEL BUSINESS

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Annotation. *The hotel business in Ukraine is rapidly developing. Trends in the development of interactive marketing tools quickly crashed into the activity of enterprise hospitality. The article deals with the main directions of the formation of junctions between the sellers of hospitality services and consumers, which are formed through the use of interactive marketing. New innovative means of interactive technologies, which are included in the activity of leading modern millers of the world, are explored.*

Key words: *interactive - marketing, internet, innovations, interactive services, hotel business, web – sites.*

Relevance of the research topic. The transformation of business processes, due to globalization of hyperinformational changes in society, allows us to talk about the emergence of a global network economy. As a result, the basic principles of the formation of business relations have changed, that is, today the behavior of economic actors is shaped by a marketing culture, the object of which is the system of relations between the seller and the consumer. Therefore, the problem is to find a powerful tool for establishing stable relationships with customers, improving sales figures, communicating information about the company to the customers and the services they provide. A source of new opportunities and a guarantee of high efficiency of cooperation with the client is the application in the management of the enterprise system of resources and tools of interactive marketing.

Analysis of recent research and publications. The conceptual principles of the functioning of marketing at the enterprise are devoted to the works of V. Gerasimchuk, A. Zozulova, V. Zunde, N. Kudenko, L. Moroz, A. Pavlenko, S. Solntseva, A. Starostina, L. Shulgina and others. The analysis of scientific works showed that the further conception of the marketing activity of enterprises in the conditions of the information society, the model of consumer behavior in the Internet, the theoretical and methodological provisions of marketing communication activities in the open Internet communities are needed. This caused the choice of the topic, determined the purpose and objectives of the dissertation.

Research results. The world's most powerful service sector is the hotel and restaurant business, it is one of the most attractive for investors, and its profitability in developed countries is not less than 40%. It is here that the dynamics of changes in the

needs of consumers and the level of influence of hyperinformation tricks can be traced. In Ukraine, the hotel business is developing rapidly, according to the latest research by JLL Company, which presented an analysis of the results of 2017 on the market of quality hotels in Kiev and the forecast for 2018. The level of loading of a qualitative number room in Kyiv reached 47.3%, having increased by 7.4 pp. This is the maximum positive dynamics of the indicator over the last five years. It should be noted that in the period 2015-2017 years the quality of the hotel's quality hotels increased in the range of 5-7 pp. for a year. If this pace of growth continues, then by the end of 2018 the download rate can reach the level of 2012 (52.1%). (Fig. 1).

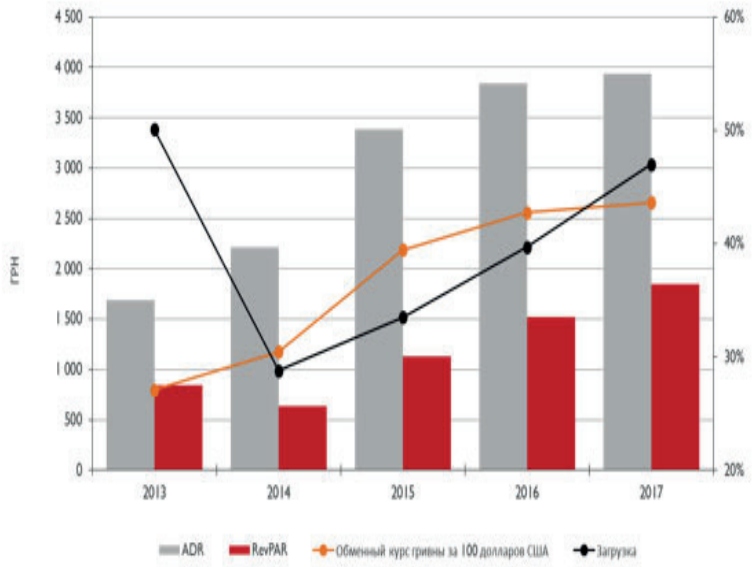

Fig. 1 Operational indicators of the market of hotels in Kiev in UAH per year, 2017 [1].
Source: JLL, STR, National Bank of Ukraine

Interactive - marketing tools used in the activities of hotel business.

Thus, the hotel business is developing but it requires the use of modern marketing concepts. Socio-media marketing interactivity makes ordinary advertising an exciting process in which customers can speak, discuss and make their suggestions to improve the hotel's overall performance. The need to diversify the forms of advertising business hotels must be transformed into interactive marketing which has great prospects on this path.

The aspects that determine the sociomedia of interactive marketing can be defined as follows:

• building relationships with potential and existing clients;

• Search for the intersection of the needs of the target audience and key marketing messages;

• creating content around key messages. It can be both pop-ups, as well as all sorts of video and text promotional services;

• the choice of the required social platform. Yes, Facebook helps to establish a friendly communication with customers, and twitter-attract new and quickly using hashtag to search for brand reviews;

• keeping new and permanent clients. These may be different loyalty programs, such as the usual loyalty cards, or interactive "breakfast for a repos or feedback," etc. Social networks can also inform their clients about bonuses and / or future promotions;

Table 1

Characteristics of modern companies of strategic marketing

Interactive marketing	**Services of commercial interactive services**
	Paid search; Display advertising; SEO; Advertising in social networks Web site Online video Blogging
	Internet послуги:
	Mobile marketing Facebook Twitter LinkedIn You Tube Email маркетинг
	Content – marketing:
	Internet news Podcasts Seminars Webinars Conferences Round tables Video portals

• communication with past customers. The use of socio-media networks allows the brand to remind itself of the customer's mark on the photo, geolocation, and more, reminding him of the pleasant moments and encouraging us to use the services of the company once more;

• constant mention of the brand on the pages of leading bloggers, with highlighting and the ability to go to the travel company website in one click allows you to transfer a huge audience of people into the section of potential customers;

• communication with reputable users of certain groups. It can be both testimonials from celebrities and people with a certain circle of subscribers;

• Encouraging online reviews and working on their positivity. Reviews are the things the modern consumer pays first of all, completely ignoring the direct advertising;

• promoting online customer service. Whether it's online booking, payment or an-

swering questions, the presence of online services that determine the interactivity of the system is mandatory.

• online support and user support system;

• Integration of social elements (mail, web sites, personal accounts). Helps to significantly expand interoperability and reach potential customers;

• QR codes. Allows you to get much more information about the service by simply pressing your finger on the screen of your gadget;

• Mobile applications and the incentive system associated with them.

As a result of all these actions, there is a reduction in the cost of advertising. A person interested will try to share this idea with friends and family as quickly as possible. Such information is more trustworthy than metro advertising and billboards. A common source in the modern hyperinformation platform is Internet communication is an interactive marketing tool, which is intensified on the basis of increasing the means of access to the Internet, multimedia, increasing the time spent by consumers online (Fig. 2).

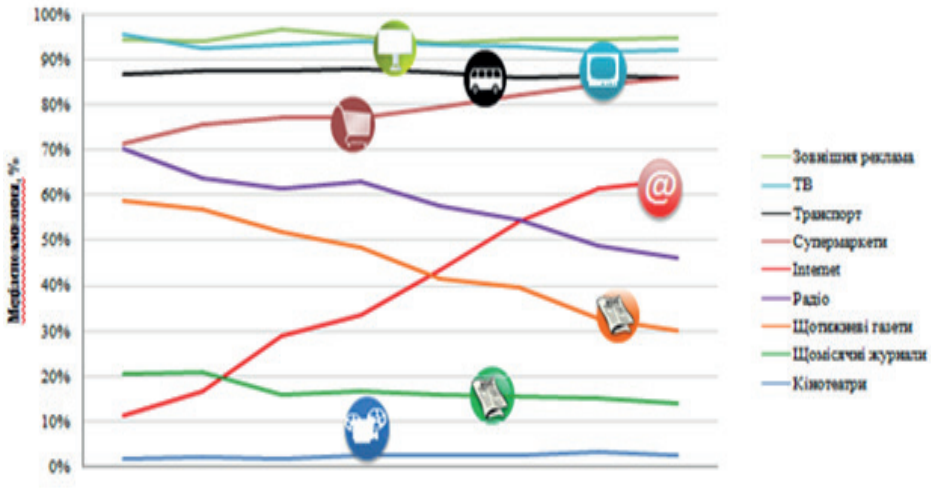

Fig. 2. Dynamics of media usage in Ukraine
Source: built by the author

Internet networks in terms of developing new horizons is increasing. Increasing the competitiveness and efficiency of hospitality enterprises depends, first of all, on new opportunities for interactive marketing companies (Table 1). The results of the survey of hotel hotels in Ukraine show that those who use their Internet work grow by an average of 6.2% per year, while those actively using online technologies-reach 13% of annual growth.

Studies show that in 2017, 60% of the population of Ukraine are Internet users, 63% of whom social networks became the main source of information, which led to the redistribution of advertising budgets in favor of the Internet.

For hotels, it is important to use content advertising. This is the most effective way

to promote a website in search engines, since the largest number of Internet users finds the necessary website through the search engine. As can be seen from Fig. 3, consumers of hotel services prefer to search the necessary information through search engines Google (75.8%) and Yandex (73.4%). In these search engines, contextual advertising is displayed at the top of the page (TOP 3) and on the right edge in the form of links that correspond to the content of the given query [3].

The main feature of contextual advertising on the Internet is that the website of the hotel is displayed both by name and by search keywords.

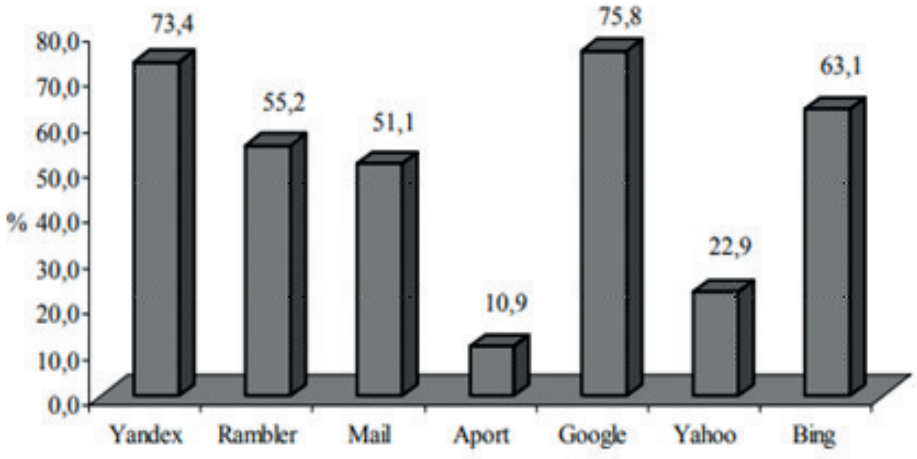

Fig. 3. The structure of search engines, which most often use consumers of tourist services

Thus, one of the priority directions of modern Internet marketing is the registration of a hotel company profile in social networks (Fig. 4). Such measures allow to promote the services of hotel enterprises among the general population and to involve different segments of consumers for cooperation.

The development of social networks in recent years has been rather accelerated and caused the emergence of a large number of social networks - analogues. Nevertheless, despite this, there are social networks that combine the multimillion-dollar and even billions of users around the world. (Figure 4) Such leaders are facebook.com, instagram.com, twitter.com, vkontakte.ru (vk.com), odnoklasniki.ua (ru).

That is why hotel enterprises should target a wide audience of consumers in order to ensure constant demand for their own products.

Creating a profile on the social network is a prototype of the hotel website, but it does not require periodic maintenance and significant costs, as updating and updating information can be done by a single performer.

The presence of a hotel company profile in a particular social network does not diminish the need to develop and implement its own website, since the latter is the primary source of obtaining the necessary information for the consumer. For hotels this is a

convenient way to get customer feedback about the overall impression of your stay at the hotel. Yes, the most popular facebook.com website and the search engine information services are Google and Booking. som

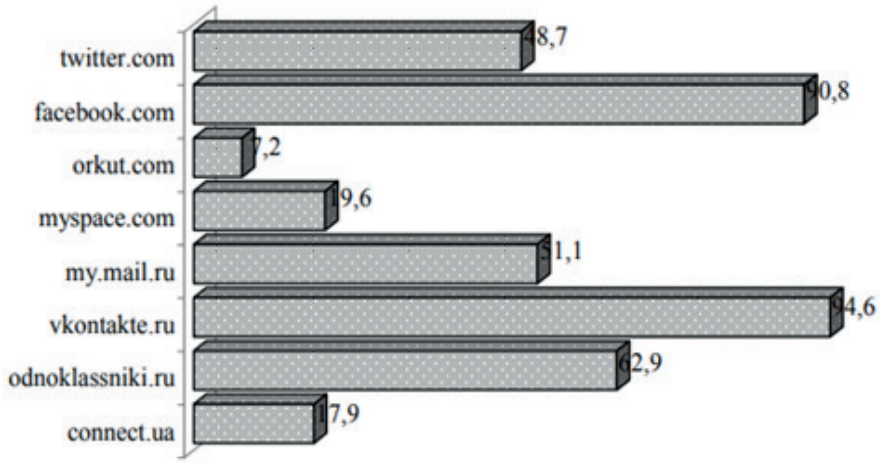

Fig.4 Structure of social networks used by consumers of tourist services

In addition to the existing interactive means of communication with the consumer, there are also innovative technologies that can be used in hotels for information communication with customers. YES, the Starwood Hotels & Resorts Worldwide, known for its love for innovation, is actively working on the concept of "intelligent" numbers.

Four Points by Sheraton, Aloft and Elements guests will be able to test and evaluate all the benefits of innovative technology to their personal experience, including access to a room with a smartphone or Apple Watch, "smart" mirrors.

As the Four Points by Sheraton brand focuses mainly on business audiences, Starwood specialists have analyzed what services and services in the hotel room are most popular with business travelers.

Innovation - "smart mirror", will work on the principle of "touchscreen". By touching the mirrored surface, travelers will get an instant to the interactive menu where you can choose to view weather forecasts, news and sports events.

In addition, through bluetooth roomed rooms can display a Twitter newsfeed or other social networks from their smartphone on the mirror.

The company plans to provide recreational helmets for creating virtual reality such as the Oculus Rift to add new entertainment options to those who want to spend time. Starwood also considers the use of Oculus Rift in the gyms of its hotels to turn the sport into a fun activity and attract the attention of guests to a healthy lifestyle.

According to an international survey by Marriott, more than half (51%) of business tourists believe that inspiration comes to them in the soul. In this regard, the hotel

network has begun testing innovative technology that will help guests not to forget all the brilliant ideas and thoughts that have visited them in the process of adopting water procedures [4].

The technology is called "Splash of Brilliance". The warmed glass partition of the soul, in essence, turns into a blank sheet. Thanks to the special sensory sensors embedded in the interactive door, all the records and images, whether ordinary doodle, equation solution, or the first line of a new novel, will be transmitted to the tablet, where ideas can be sent to yourself or an instant messenger.

How much technology will come to the senses of guests and which of the new products will be in demand in our hotels, it is difficult to say now. It remains to wait for the first impressions and analyze guest feedback, protesting the new technological chips of Starwood Hotels & Resorts in their own experience.

Conclusions. Interactive - continuously marketing, expanding the structural and functional characteristics of traditional marketing. The third main structure of interactive means of communication with the consumer in the modern world is the emergence of new innovative technologies that help to investigate the behavior of consumers of hospitality services. That is, for modern Ukrainian hotels it becomes necessary to constantly monitor the market of innovative interactive technologies, promote its website, take into account feedback on information Internet services and use content advertising.

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THE ROLE OF TAXATION IN THE FORMATION OF INDIVIDUAL INVESTMENT STRATEGIES IN THE UKRAINIAN FINANCIAL SERVICES MARKET

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Annotation. *This article deals with pragmatic aspects of taxation of individuals' incomes in the financial services market. On example of Ukrainian tax system the effect of tax factors on the investment behavior of individuals is researched. The peculiarities of taxation of individuals' income in different segments of financial services market of Ukraine are disclosed. The discrepancy between the existing practical approaches to the taxation of individuals' incomes in the financial services market of Ukraine to the principle of equity in taxation is established.*

Key words: *tax system, tax, household, individual investments, investment portfolio, financial services, deposits, securities.*

A compulsory participant of any market is a consumer who forms demand on different goods and services. The modern market of financial services, development of which depends to a large extent on the investment behavior of individuals, is no exception. Among the factors that determine it, one of the main places is taxing of income from financial transactions. It is clear that taxation system of individuals' incomes on the financial services market of Ukraine is not fully effective, especially taking into consideration the current state of its development. Thus, the issue of tax component improvement of the Ukrainian financial services market development becomes special importance and requires application of fundamentally new scientifically justified approaches.

The problems of taxation of individuals' incomes on the financial services market were considered in the works of many domestic economists. In this context, firstly should be highlighted the significance of scientific results of V. Andrushchenko, L. Barannik, T. Vantukh, O. Volkova, V. Glants, A. Zadorozhniy, D. Leonov, S. Manzhos, I. Salo, A. Fedorenko, B. Fedosova, I. Turcan, I. Chugunova and others.

In fact, at current stage there is a significant potential for growth of domestic financial services market due to the improvement of individuals' transactions taxation. This determines the main purpose of this article - the analysis of income taxation mechanisms from operations of individuals-consumers of financial services and the assessment of taxation impact on their market behavior.

When studying the incomes taxation of individuals-consumers of financial services, we focus on key points that can't be avoided during the analysis. First of all, we are talking about the mechanism of demand formation for financial services. When choosing one or

another kind of financial services, consumer hopes to obtain certain economic benefits, the final value of which depends on the amount of tax paid. So, different tax burden for different financial services can significantly impact on the investment priorities of individuals and distribution of their savings among financial services market sectors.

The next aspect, which affects the investment behavior of individuals-consumers of financial services, is the presence of gaps in legislation (moreover, not only in the tax one). Their existence makes it possible to evade or avoid taxation at all. It should be noted, that taxation is not the only one factor that affects the behavior of financial market participants. It operates in combination with other factors and may not always be determinative when choosing one or another type of financial service. Finally, when examining the issue of taxation, we can't abstract from the problem of taxation equity. Firstly, the principle of equity should be corresponded with taxation of income from transactions carried out by individuals-consumers directly on the market of financial services. Secondly, incomes' taxation from operations on the financial services market is an integral part of the general system of individuals' incomes taxation. So it is advisable to assess the equity of incomes' taxation received in the financial sector comparatively to the taxation of individuals' income with a different source of origin.

At the third decade of Ukraine's independence, we can talk about the formation of sustainable priorities in the private sector concerning the investments in the financial services market. Unfortunately, we could also state that these priorities can hardly be considered in the context of stimulating factors of the Ukrainian economy development. Rather, there are grounds for asserting that exactly savings and investment strategies of households are significant factor of restraining of Ukrainian financial sector development. In fact, only bank deposits are that kind of financial services that are in greatest demand from individuals-consumers. At the same time, non-bank financial institutions couldn't offer to this group of consumers other investment alternatives.

At the same time, even for the most developed market of bank deposit services, there are significant imbalances, which affect its dynamics (Figure 1):

At the fig. 1 there is a clear trend to significant reduction in household deposits volumes in domestic banks. It is clearly that in many respects the stagnation of this segment in 2014-2015 is determined: firstly, by devaluation of the hryvnia, resulting in depreciation of concluded deposit agreements' value; and secondly, negative balance of household deposits in the conditions of acute economic crisis. Taxation of interest income by deposits began in August 2014 and was primarily caused by necessity to replenish the revenue part of the budget. By that time, idea of taxation of interest income accrued on deposit accounts was not realized primarily because of the fear of loss of part of depositors as a result of negative influence of tax factors.

According to the paragraph 167.5.1 of Tax Code of Ukraine, passive income in the form of interest on deposits is taxed at the rate of 18% [2]. This is standard salary tax rate, other incentive and compensatory payments, remuneration payable to the payer because of his employment relationships and civil contracts. In 2014, interest on deposits began to be taxed at the rate of 15%, which is significantly more than 5%, which was

anticipated earlier. Since 2016, the rate was fixed at the level of 18%, which, together with the military tax, leads to the elimination of 19.5% of income.

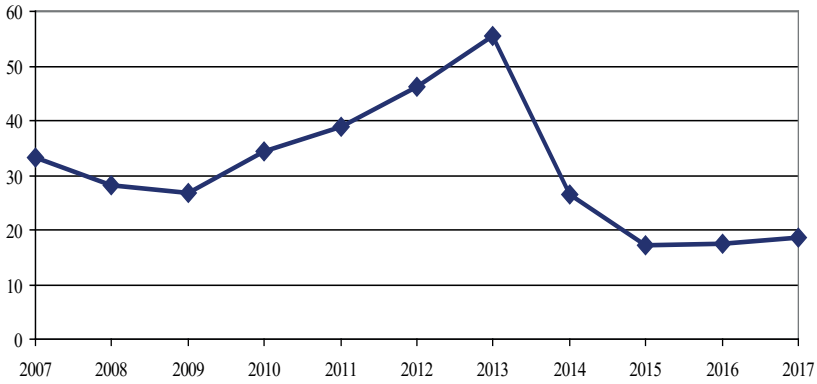

Fig. 1. Deposits of households in the banks of Ukraine for 2007-2017, in the equivalent of billion dollars
Source: compiled by authors according to the data of National Bank of Ukraine [1]

In this context, there is issue about the fiscal effect of interest income taxation and on the impact of taxes on individuals-consumers of bank deposit services. Dynamics of taxes earnings on interest income and their share in the total income tax on individual incomes in 2015-2017 are shown in Table. 1:

Table 1

Tax earnings on interest income of individuals in Ukraine

Indicators	2015	2016	2017
Income tax of individuals, UAH millions	99 983,2	138 781,8	185 686,1
Growth rate,%	-	138,8	133,8
Tax on interest income of individuals, UAH millions	8 217,9	7 611,2	6 015,9
Growth rate,%	-	92,6	79,0
Share of tax on interest income in total amount of personal income tax,%	8,2	5,5	3,2

Source: compiled by authors according to the [3]

According to the data of table 1, earnings of tax on individuals and interest income tax are characterized by opposite trends. This determines the reduction of interest income tax share in the total earnings from income tax of individuals. However, in our opinion, reduction of fiscal role of interest income tax can't be explained by increase of tax burden, which was at the level of 15%, then increased to 20%, and eventually recorded at the level 19.5% (18% income tax+ 1.5% military tax). Our conclusion is based on the study of individual indicators dynamics of Ukraine's deposit market (Table 2):

Table 2

Number of depositors and volume of individuals' deposits in participants of Fund for Individuals Deposits Guarantee, 2008 - 2017

	01.01. 2009	01.01. 2010	01.01. 2011	01.01. 2012	01.01. 2013	01.01. 2014	01.01. 2015	01.01. 2016	01.01. 2017	01.01. 2018
Volume of deposits, UAH billions	204,9	198,0	252,4	282,6	338,5	402,6	382,1	362,3	382,1	413,8
Number of depositors, millions	34,5	31,6	32,6	35,0	44,4	47,4	46,5	44,7	41,1	41,0
Average deposit volume , UAH.	5243	6273	7802	8072	7619	8486	8213	8104	9298	10104

Source: compiled by authors according to the [4]

Based on given data, it is hardly possible to make a conclusion that taxation led to outflow of deposits. Despite a decrease in the amount of deposits in 2015, the situation stabilized and this indicator started to grow again. The indicated trend is observed at the background of sharp decrease in number of banks, number of depositors and loss of confidence in banking system by individuals. Regarding the number of contributors (with this name the indicator is positioned at the Fund for Deposits Guarantee website), we note that it is likely meant number of deposits, as one individual may have several deposits. Reducing dynamics of this indicator is more likely to be caused by liquidation of banks than the introduction of interest income taxation.

Controversial situation is also concerning the taxation of individuals' income received from insurance services. It should be noted, that trends in insurance segment of Ukrainian financial services market are extremely complicated: firstly, the number of contracts with insured individuals in 2013-2017 decreased from 80.3 million units to 66.9 million units; secondly, during the same period, negative trends were not overcome in the field of life insurance, share of which varies within 10%; and thirdly, the big share of insurance premiums forms mandatory types of insurance, while voluntary insurance significantly inferior by level of development [5].

In evaluation of taxation impact on the development of insurance market, it should be taken into account that insurance in modern economy has a special purpose function, so, when choosing insurance service, not only tax factor is taken into account. An individual can receive income from insurance services in different ways:

1) during realization in its favor of insurance payments;

2) when receiving insurance payments, insurance reimbursements, redemption amounts.

In the first case, tax regime depends on category of person who make payments for individual beneficiaries and from the limits concerning the amount of payment. Release of insurance premiums paid by beneficiaries itself is logical, since for them it is not revenue, but expenses. However, it should be borne in mind that in some cases an individual can pay insurance premiums in his favor from income from which the income tax has already been paid, while in others it is not. This remark also applies to the

payment of insurance premiums in favor of the taxpayer by members of the first degree family kinship.

When analyzing the current procedure of individuals' income taxation received on the insurance market, we should note that in this case, decision for receiving income in this way is taken not by the payer itself, but by the employer. Such income at the moment of its calculation is purely conditional, and the tax is real, since it must be paid from salary to its payment to hired employee. For stimulation of social responsibility of employers, the state as a taxpayer is prepared to take certain losses by imposing limits in which the employer, as a tax agent, may not pay taxes on this type of income. So the income tax is not paid if the sum of contributions paid by the employer does not exceed 15% of calculated salary amount to the taxpayer, but not more than 2,5 times the minimum salary.

It is difficult to explain why such restrictions are set by the state. Available sources of information do not contain any arguments and calculations on this regard. Let's try to assess whether the restrictions are justified. On the one hand, in the conditions of deficit of state pension fund, the participation of employers in future pension provision should be supported by the state. However, firstly, deduction of contributions to non-state pension funds does not guarantee payment of pensions in the future (among the main reasons is depreciation of national currency, bankruptcy of non-state pension fund), and secondly, employers can create controlled non-state pension funds and withdraw funds there in form of contributions, increasing costs and thus minimizing income tax. So not either hired employee or state will have a positive result. Therefore, it is expedient to establish restrictions. It can in certain way restrain expense increase if you have to pay income tax.

In order to stimulate individuals to use the services of insurance companies for long-term life insurance, non-state pension funds and banking institutions - from non-state pension provision, the state grants taxpayers or family members of first degree of kinship, which make contributions under long-term life insurance contracts, non-state pension provision , under a pension contract with a non-state pension fund, as well as contributions to bank's pension deposit account, pension contributions and accounts, participants of the banking management funds, the right to a tax discount. So individual - the taxpayer of income tax has the right to reduce the taxable annual income on the amount of paid contributions under mentioned above contracts, but again under certain restrictions:

- when paying contributions in their favor in an amount that does not exceed the monthly living minimum for an able to work person on January 1 of reported tax year multiplied by 1.4 and rounded to the nearest 10 UAH;

- when insuring a family member of a taxpayer - 50 percent of the amount.

Not in favor of choosing this type of services there are also the rules of taxation of insurance payments of redemption amounts or pension payments that are payable to the taxpayer under long-term life insurance contracts (including life insurance pension contracts), non-state pension provision, pension contributions and by trust management

contracts .

By classic canons of taxation, an increase in income must be taxed, so in this case, the excess of amount of insurance payment over paid contributions. So given amount, depending on the terms of payment, should in 1.67 and 2 times, respectively, exceeds the amount of paid contributions. Therefore, when deciding on choice of financial service, smart consumer will take into account this circumstance and also take into account the asset's impairment in time, as long-term life insurance and non-state pension provision contracts are concluded for a long period of time.

Comparing the conditions of incomes' taxation from deposit operations and from operations on long-term life insurance and non-state pension insurance, we make a conclusion concerning the use of sole approach by the state when collecting income tax in these cases. The issue arises whether this approach is correct, taking into account the various purposes which the payer puts when putting funds on deposit accounts and when entering into insurance contracts and what are the risks for him?

As a rule, during depositing operations, the payer is guided by short-term perspective. But with the stable financial condition of bank and macro-financial situation in the country, the payer can capitalize received income, increasing the asset and obtaining additional income. Interest rates are known to the payer and he can make his own calculations when evaluating future earnings.

When conducting contracts of long-term life insurance and non-state pension insurance, the payer has long-term goals, which is ensuring income in the future when he will be at disable age. And if, under long-term life insurance, amount of insurance payout is known to the payer, then with non-state pension insurance – it's not. The payer does not know in which way paid contributions are used and what income they bring, and also what final amount he will receive as a result of insurance contract expiration. Therefore, use of such financial service is more risky.

Another factor which should be taken into account is depreciation of the payer's assets. Of course, this factor works in both cases, but in the case of insurance, its consequences are more vulnerable, as individual will not be able to get the expected income at retirement age. You can break the contract ahead of schedule both with the bank, and with the insurer. However, if in the first case interest income is not accrued at all, or accrued at minimum percentage, then in the second - 100% of the redemption amount will be taxed. Firstly, it is unclear whether this is, indeed, the income of payer, so redemption amount exceeds the interest paid. Secondly, in this case, the state is in its interests and in insurers' interests.

However, such behavior does not correlate with necessity of stimulation of citizens' free funds depositing in future pension provision, taking into account the deficit of pension fund and inability of the state to provide a decent level of pensions. Risk of national currency devaluation does not work in favor of insurance services. In our opinion, reducing the taxpayer's losses from asset impairment can be made through taxation: either through reduction in tax rates or through adjustments to the tax base.

Conclusions. Having researched taxation of incomes of individuals–consumers of

financial services, we make a conclusion that at whole it is carried out according to general rules of taxation. This also applies to taxation of interest income received from funds placement on deposit accounts in banks and from insurance services. We believe that taxation of individuals' incomes at sole rate of 18% does not correspond to the principle of equity in taxation, and therefore, taxation of incomes of financial services consumers at the sole rate is also considered as not fair.

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MANAGING THE 2008-2009 CRISIS BY 2014 IN THE COUNTRIES OF THE VISEGRÁD FOUR

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Annotation*. The countries which gained their independence during the early 1990's in Mid-Eastern Europe gained their greatest opportunity of modern history by joining the European Union. This opportunity served to decrease their lagging behind the western countries. After they joined, however, the 10 years that passed granted them both positive and negative experiences. The recession dealt a great blow to their catching up, and showed problems with both the member states and the entire EU as well. Our study aims to answer how these processes affected the Czech Republic, Poland, Hungary and Slovakia in the last 10 years full of happenings.*

Key words: *recession, debt slump, Visegrád Four, unemployment, national debt.*

Introduction. The countries which make up the Visegrád Four reached an incredible success after they joined the European Union: even before they entered the union, the most notorious experts and politicians campaigning against the EU also had to show their awe at the continuous economic development and the explosive growth. We chose this topic - introducing the recession, and analysing the reactions of the countries to it - because said decisions, may they be positive or sometimes negative, have a huge influence on our daily lives even now. „After the economic crisis that broke out in 2007-2008, a wide range of practical practices for crisis management practices and regulatory oversight were created. However, as long as there is no comprehensive, "settled" theoretical-methodological renewal in the economics of public finance governance, until there is no new (at least) new scientific methodology, the sustainability of the achieved consolidation results is weak." (Lentner, 2018)

The financial and economic recession of 2007/08 broke the flourishing period of 10 years in a flash: the recession starting from the secondary mortgage sector of the United States of America stormed across the globe, and broke this prosperous time often leaving behind radical changes and insecurity. „Drainage of credit channels, market mistrust, lasting economic downturn, then state rescue packages, regulatory efforts - these are the effects of the crisis and its main consequences." (Lentner, 2016) Therefore, we dedicated the first chapter of our study to introduce how this recession which grew to a global size came to be, and the results of its shocking effects. Furthermore, we wish to focus on the countries of Europe, mainly the V4 countries mentioned above, which will be the pillar of our study. We'll introduce how the ex-communist countries which lead the communist bloc faced the challenges of the market economy as free states after the regime change,

and how they were put under the wings of the EU which saw them as treasure troves of possibility and a new market. We'll also cover how they closed the distance due to the efficient aid of western countries and the fundamental changes they introduced, and how this process was toppled over by the recession. Though 25 years ago, their starting point was essentially identical, the quarter-century which passed by since then has placed them in very different places, often due to their very differing economic policies and decisions in various situations.

We wished to compare the performance of these countries after they joined, but before the recession shook the world: we wish to use figures and diagrams to introduce the processes behind their imposing growth, and the decisions they made and their effects which were significant in this period. Among the main indicators translated to numbers, we can list the gross domestic product, and its percentage change, as these are indispensible for a country's growth, and may be used as a well-defined basis for comparison. By introducing the level of national debt, we can satisfactorily define the difference of each countries' economic potentials, which is why we chose to evaluate that too. We also analysed how the unemployment rate changed in the V4 during the last few decades.

After this, we'll take a look at the period after the recession, up until 2014. Due to making the databank and the curves easier to interpret, the period we analysed (2004-2014) was bisected into two smaller timeframes. The indicators mentioned above, the figures and the curves helped us illustrate the changes, and the effects of positive and negative happenings. The most notable key question of analysing this topic remains the analysis and evaluation of decisions which aimed to react to the recession.

We also evaluated how the indicators affected each other. During the analysis of the different connections, we used the Pearson correlation method to analyse the numbers we obtained, which makes it possible to reach feasible conclusions.

As a finishing touch, we used the data we obtained, and the connections we identified to draw a final conclusion. During the deeper analysis of the topic, we faced multiple problems, processes and situations which could help both the European Union and the V4 countries to manage the recession's effects if they were to be solved and used. “The continued positioning in global competition puts the state at the forefront of new challenges.” (Lentner – Zéman, 2017) We'd like to highlight that our evaluations and opinions were formed objectively, based only on the collected and resulting data, regardless of which political party's decisions resulted in them.

Though the topic is fresh and timely, during our visits to libraries, we found many interesting and useful documents, which helped us in understanding and properly navigating between the processes in question. Furthermore, our analysis was based on the many magazines, articles, analyses and other publications available. To create the figures, we used the Eurostat, the official statistics website of the European Union, to obtain the data required, be it actual or many years old. Furthermore, we also obtained a rich variety of useful information while surfing the websites that have statistical data of the countries in question as well. “As a consequence, the state has been given a new role

in crisis management in the financial sector, ie a strong market-regulating and control power, which, due to the emergence and escalation of the crisis, must focus on financial markets and banking institutions." (Lentner – Zéman, 2017)

Material and method. In our study, we wish to handle macro-economic indicators together. Our goal is to find out how tight the relation between the changes of the various indexes' changes are. While we analysed the connections, we chose to use Pearson's linear correlation coefficient: the two variables were already decided., which is why the value of the correlation coefficient that serves as a basis for the evaluation is independent of the measurement units of the variables. In order to make it possible to handle the data more proficiently, and to gain a deeper insight related to them, they were divided, resulting in two time periods subject to analysis - the period before the recession, and the period after it.

The questions which we wanted answered in light of the countries were the following:

• What level of dependence exists between national debt and unemployment?

• What level of dependence exists between the percentage change of GDP and unemployment?

• What level of influence does the percentage change of GDP have on national debt?

Results. National debt / Unemployment rate

The basis of the first comparison was the ratio between the level of GDP-based national debt rate and unemployment rate.

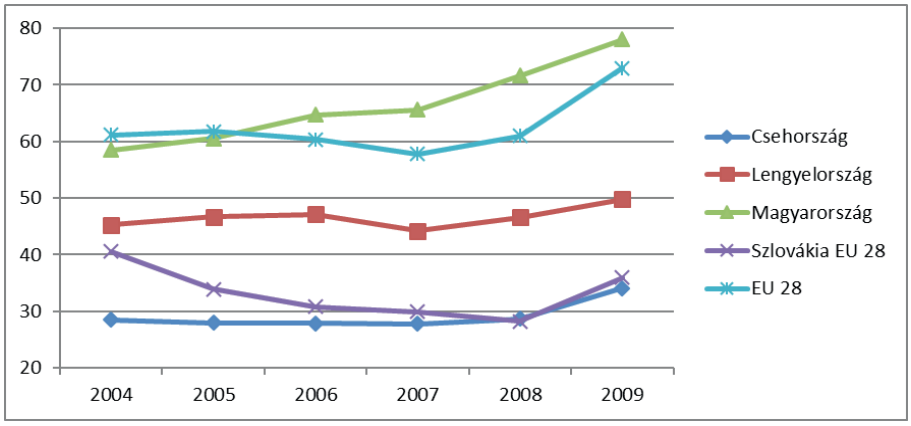
National debt / unemployment	Czech Republic	Poland	Hungary	Slovakia
2004/2009	-0,1314	-0,3260	0,9708	0,6503
2009/2014	0,4864	0,8438	0,7635	0,5559

1.Chart: Ratio between national debt and unemployment

Source: Self-made, based on the data of the HCSO

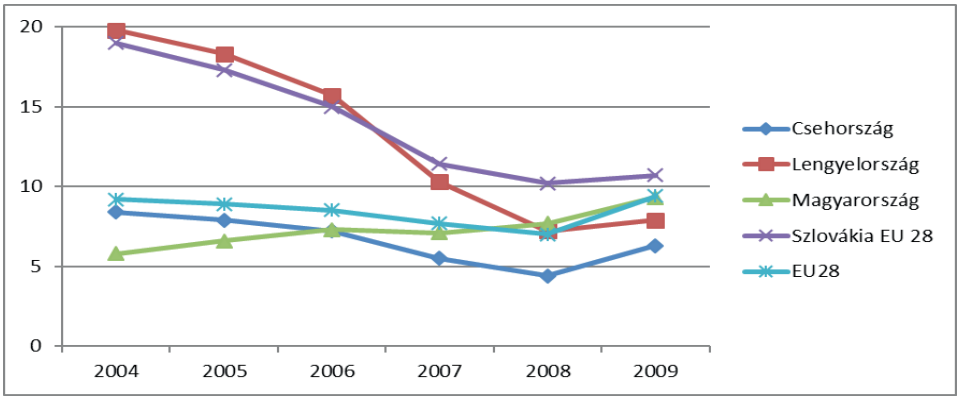
In the case of the Czech Republic, we can state that according to the results we gained, the first six years show a strong, but inverse relation between national debt and unemployment: while the national debt mostly stagnated, the Czech were able to do a smart management trick to use this stable economic background and significantly decrease unemployment. The curves of the first and second figure mainly moved together only in 2009, the year after the recession began. This was due to how they couldn't stimulate their economy by increasing national debt, in a way that they could compensate for the high increase in unemployment rate.

This was also the case in the second period. In other words, the two indicators increased together, and stopped on a certain height, which couldn't be decreased for years, even with concentrated effort and interventions. The reason we can't state that there's a tight connection between the two analysis elements is that though both increased together for a while, there was still a time difference between the curves.



1. Figure: Changes in the national debt compared to GDP of the V4 countries between 2004 and 2009
Source: HCSO

In the case of Poland, as we already stated at the Czech Republic, though national debt had strong fluctuations, it moved within a narrow 5% interval between 2004 and 2009. The steep decrease of the unemployment curve can also be accredited to the stability of the macroeconomic background environment, similarly to their western neighbour's case. In 2009, we can once again observe a movement towards the same destination, which means that in line with increasing national debt, the people who lost their jobs also increased.

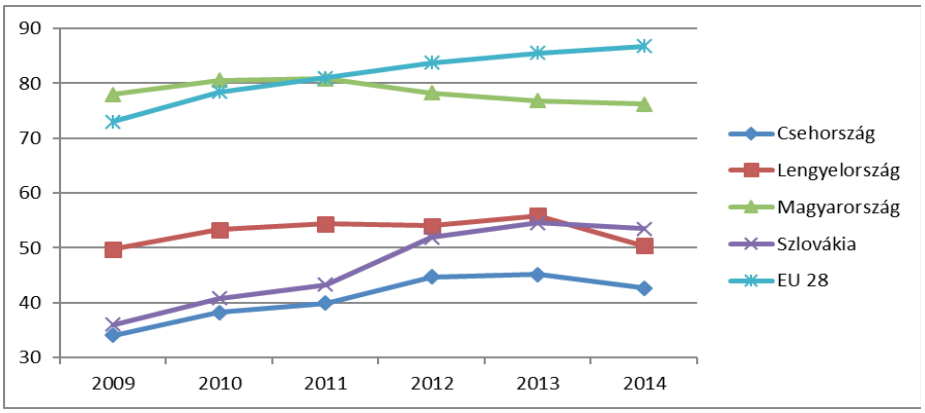


2. Figure: Changes in the unemployment rate of the V4 countries between 2004 and 2009
Source: HCSO

Due to how the government successfully intervened in the country's economy, neither the curve of national debt, nor that of unemployment got out of hand. The excessive tightness lets us speculate that the measures taken by the government almost immediately had their effects on Poland's economy. This is further affirmed by how the

indexes had basically identical movements after the recession wave reached the country. The continuous development was aided by the constant values in this period, as neither the national debt, nor the unemployment had a significant deviation in this period.

As Hungary was always a member state between a rock and a hard place as far as the national debt goes, we can't observe any inverse movement between the two curves. Furthermore, the two basically independent indicators moved as if they were welded together in the first period: the constant increase of the national debt caused the acceleration of the economic development to come to a standstill. This resulted in the fact that while the area had one of the lowest levels of unemployment, said levels began a steep increase. If we place the two curves on each other, they would completely block each other.



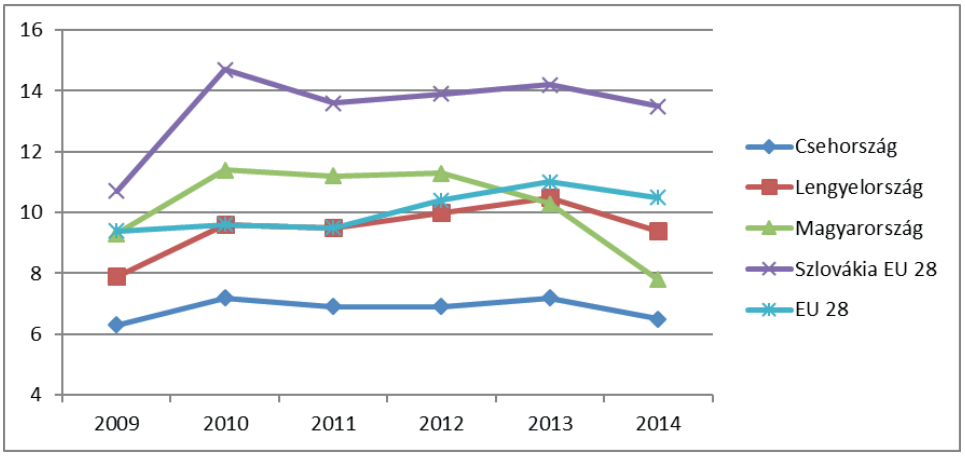
3. Figure: Changes in the national debt compared to GDP of the V4 countries between 2009 and 2014
Source: HCSO

This is when the national debt piled up since the beginning of the decade reached its maximum value, which was followed by a slow receding tendency until 2014. The changes in unemployment showed the same movement, but in that case, the government's interventions produced results slowly, therefore, though with a two-year time lag, the result was a greater decrease compared to the other indicator.

In the case of Slovakia, the connection between the two curves was not as tight, but throughout the entire timeframe, they were pretty close to each other. The decreasing tendencies only changed back to increasing when the recession hit. The connection can't be called tighter because while in the case of unemployment, a significant starting value started to decrease, the country had a solid position in the case of national debt during the entire analysis period.

The direction the two curves moved towards remained the same even during the recession management period, but while unemployment almost immediately got out of hand, and increased by 50% in a single year, the national debt began to slowly increase.

This is also one of the reasons that they could put a stop to the deterioration of the situation. The fact that both indicators showed signs of decrease during the analysis period is also proof of how things were put into order.



4. Figure: Changes in the unemployment rate of the V4 countries between 2009 and 2014
Source: HCSO

Percentage change of GDP / Unemployment

Percentage change of GDP / Unemployment	Czech Republic	Poland	Hungary	Slovakia
2004/2009	0,3608	0,2376	-0,9382	0,2157
2009/2014	0,6190	-0,2406	-0,0481	0,9511

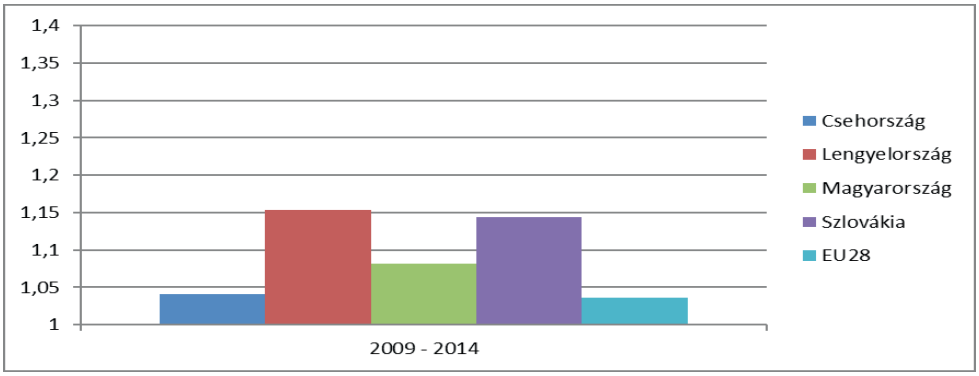
2.Chart: Ratio between percentage change of GDP and unemployment
Source: Self-made, based on the data of the HCSO

Out of the two indicators of the second comparison, the basis was the percentage value of the change between the year's and next year's GDP, while the other was once again the unemployment rate. We chose the annual percentage change in GDP instead of the GDP per capita because we thought that using the differences between two years' data, we can illustrate the performance of the countries during a year much better.

In the case of the Czech Republic, the two indexes had different paths until the very last year: The continuous expansion of the economy which increased beyond 5% lead to the reduction of unemployment. In later years, the economy made a major fall, which caused the people who lost their jobs to multiply once again, albeit with a time lag. The Czech economy shrank by 20% in two years, which was such a high volume for it that it was capable of dragging the unemployment rate with it, which produced fairly good numbers until then.

During the period after the recession, we can observe a much tighter connection

between the indicators based on the chart: however, the performance of the Czech economy which once again started to increase couldn't solve the increasing problem of unemployment, which resulted in a higher number that stagnated.



5. Figure: Percentage changes in GDP values of the V4 countries, 2009 -2014
Source: HCSO

Poland remained the last one standing in the development race, either of the V4 countries, or of Europe. Their initial growth of annual 6-8% decreased step by step, still, a more significant recession was ultimately avoided. This also caused the indicator of unemployment to be in an advantageous position, which was pushed back to 6%, compared to the 20% it was when they joined.

During the years of the recession, the unbroken development slowed down, and while we can't say that there was a shrinking tendency, the Polish growth should be called peaky at best. This, however, was felt significantly by the unemployment indicator: by closing enterprises, or structural redesigns due to cost saving, many employers began to sack their employees, which lead to the increase in unemployment rates. Therefore, while they are the lone contenders which remained in growth, even the Polish Miracle couldn't save all the jobs.

The Hungarian economy produced a decreasing tendency right from the year of joining: the recession basically hit the country even before it could begin its world tour from America in 2008. The slump which was steadily growing was capable of knocking the country even deeper from their deep starting point, which lead to an extreme shrinking in the area in the end. Compared to this, the indicator of unemployment kept steady for a few years, however, it managed to inch until 10% from an unbelievable 5%, which was also a factor in the seemingly unstoppable decrease in the country's GDP (Matolcsy, 2008).

During the period of getting out of the recession, the first step of stopping the increasing unemployment, and the second step of its tendency shifting towards decrease after years of stagnation were both thanks to the steady awakening of the Hungarian economic performance. Though the advancement was still slow, it could be said it was a

tendency, which allows for a positive outlook.

In the case of Slovakia, it was already mentioned that the unemployment rate was quite high, which was why it had to be pushed down as much as possible, which could be guaranteed by the annual development of the economy. The growth, starting from 5%, was further strengthened during the years, and finally broke through 10%, which was closed by a strong, 15% fall during a 2 years period. The luck of their economy is that this wasn't followed by the unemployment rate at first, which is why the government of Slovakia had time to concentrate on saving their economy, and realise social interventions which were capable of dampening the possible increase in unemployment.

Their foresight was partially worth it, still, they couldn't prevent their not-so-low to begin with 10% unemployment rate from further increasing. It's interesting that though their economy began on the path of development without question, at the same time, even more people lost their jobs, and when the gross domestic product fell behind, the number of employed people increased. One of the reasons for this is the set of problems related to the competitiveness of the workforce we mentioned already. The development of Slovakia's economy was impossible to satisfy for the Slovakian labour market, since the positions and jobs requiring expert knowledge were impossible to fill by the offered workforce who lost their jobs. In order to fill these vacancies, factories drain the human resources from abroad.

Percentage change of GDP / National debt

Percentage change of GDP / National debt	Czech Republic	Poland	Hungary	Slovakia
2004/2009	-0,9520	-0,7287	-0,9344	-0,4854
2009/2014	0,4222	-0,2228	-0,0638	0,4130

3.Chart: Ratio between percentage change of GDP and national debt
Source: Self-made, based on the data of the HCSO

Once again, we'll start with the Czech Republic. In their case, the two indicators had a tight connection, but the paths they took were entirely different. Due to their national debt, which had an excessively good position, the economy was capable of producing a steady growth. When the situation worsened, the two curves obviously changed in different directions. The decrease in national products had to be compensated somehow by the state, which lead to increasing national debt.

In the period after the recession, however, they took a similar route. This suggests that the economic growth was funded by loans: though GDP was steadily increasing, this was also followed by the increase in national debt, therefore, the Czech economy-inducing packages didn't result in their desired, short-term effects, which means the economy was incapable of reaching development without significant governmental financing.

As for the Polish curves, though not to this level, we can find significant similarities: the slow increase of national debt helped keep up the flourishing period. This was followed by the debt reaching its peak value, which is also the minimum value of the

period, followed by the steady slowing rate of the value. However, in contrast to the receding growth of the economy, national debt didn't increase, therefore, a strong basis for development was kept in place.

However, in the latter period, we couldn't even observe a connection of this level between the movements of the two curves, as they were fundamentally unrelated to each other. We can still observe that the coverage for investments needed to flourish the economy was procured from loans out of necessity, but even this didn't lead to a steep increase in the national debt. In the last years of the period, we could see how the country was capable of standing on its own feet again, since their economic growth was accompanied by a decrease in their national debt.

Hungary is the perfect example of how these two indicators can influence each other. The series of incorrect decisions was capable of throwing the country into a debt spiral from which escape seemed impossible, which resulted in the government trying to counterbalance the receding development of the economy with increasing governmental spending (Matolcsy, 2008). However, the money lent endlessly was used incorrectly, which is why they were incapable of producing a significant effect on domestic production. This tendency increased all the more, without any sign of improvements: the country found itself in an absurd situation where most of the excess spending of the government was used for investments that not only didn't increase the GDP, but decreased it instead.

The state of affairs changed to a somewhat better outlook after the hard period of 2008/2009. Though the national debt increased without stopping, governmental investments started to have a faint effect, and they managed to drive the country towards a more advantageous macro-path. At the end of the period. the performance of the economy was even capable of reaching a steady decrease in debt, which meant the advantageous processes could perhaps cause a long-term improvement.

In the case of Slovakia, we could observe the main points of a modern, small country incapable of supporting itself without any deviation, right until the years before the recession hit: The capital that flowed from abroad made sure that the economic growth is steady, and the country could slowly decrease its national debt using its remaining capacities. However, the moment the investments stopped, and the changes in GDP showed a strongly negative tendency, the state had to somehow compensate for the missing foreign capital, which caused them to take on significant burdens. The intervention was obviously successful, since though only a few years caused their national debt to increase by 50%, they were capable of once again giving a push to their economy, and we can expect them to begin to flourish once again, as they did before the recession hit.

Conclusions. After unearthing the connections, we'd like to share our recommendations and conclusions which can be used for advantageous intervention not only for the countries themselves, but the entire European Union as well.

1.) Evaluating the institutional system of the European Union: the recession quickly, and perfectly identified problems which caused a headache for the EU for decades, and

which were pushed below the rug completely until then. Currently, it seems that out of the basic goals of economic and political integration, only the former was managed, and only to a certain degree. This is due to how the Union was incapable of making an European recession management programme, which would be accepted by at least a majority of the member states, and gather their support. If we take a look at only the V4 countries, we can immediately see a small-scale model of the problem, as they themselves have three different interpretations of what it means to be a member state. Slovakia is the eminent, who basically subject themselves fully to the European perspective and decisions, which includes a higher level of economic integration, which made the tempo of their development was one of the most notable. Staying true to this state of affairs, they fell the hardest as well, but they were also quick to recover, as they're a small economy. For Poland, it's important to have European resources, but they also try to protect their own economy as well, and they mostly try to develop their own economy, and manufacture for domestic use. However, from a political perspective, Poland may be the most developed one of them, and they aim to increase their influence to the entirety of Europe. The Czech Republic and Hungary also like the hundreds of millions of Euros subsidies, but they have a far smaller tolerance for anyone intervening in their internal political affairs.

Due to these reasons, we think it's necessary to work out an all-encompassing common policy as soon as possible, as advancing in the EU could only be made possible with joint effort, due to how every member state is reliant on all others.

2.) The topic of the Euro is the other important problem, which should be solved even a day earlier by the member states. However, it's impossible - based on our previous statements - to create an economic development and integration if a third of the countries taking part in it have a different official currency. Also, one of them is the country - the United Kingdom - which uses the Pound, one of the Euro's potential adversaries. It should be a priority, most notably for the smaller, more dependent countries who can only protect their currency for a limited amount of time against outside attacks, to introduce the Euro as fast as possible in their economies as well. This naturally has to happen at the same time their national monetary tools are reduced, which most of the governments don't want to hand over as a task. On the other side, we can also say that the Euro needs to develop its influence as well, and has to be introduced in as many countries as possible, if it wants to become a contender to the currently ruling champion, the Dollar.

3.) Our third recommendation concerns the quasi-legendary Maastricht criteria, encased in stone: soon, even elementary school children will be able to list the three most known criteria highlighted among the entry criteria of the EU. Though during our work, we tried to limit ourselves to analysing the performance of the V4 countries, we saw the values of the EU 28 on one of the figures subject to analysis. As it was made a fact that these criteria are practically worthless, unless there's a strong overseeing authority behind them. Perhaps the most notable fact is how the national debt level moved, where Hungary with their indicator number decreasing (albeit from 80%) are still just dragging

the average down. This makes one wonder, as a nation's national debt isn't generated in a year or two, but amassed during long years of governmental budgets with a deficit. The leadership of the Union, and its regulations, however, state that they only start the over-deficit process above 60%. The process itself however yields actions which take effect after 1-2 years at the earliest, causing a decrease. The prime example is, once again, Hungary, who was basically capable of making the cut at the most appropriate time, and ever since then, was unable to even close in on the previously mentioned 60% national debt limit.

Therefore, we find it advantageous to make the criteria more flexible, as they've become behind the times, and if necessary, they should either be lifted, or removed entirely. These criteria would have true meaning only if the EU itself would abide by them, and deviations would be followed by repercussions.

4.) In this point, we'd once again want to highlight the lack of a strong European leadership. Our next recommendation is also based on this, which is the overseeing of European funds, and the projects they were used to actualise. The member states freshly joined arrived right at the middle of the 7-year European budget period. In this period, they weren't in a position to have priority, but their economies were subsidized by significant sums of money. In 2007, a new 7-year period started, however, the money faucets were grandly opened to them in this period: Hungary alone requested for, and was given 35 billion Euros of subsidy. If even this unbelievable amount of money, which is nearly half the production of Hungary for a year, was not enough to drag Hungary out of the ditch it's in, then some kind of problem exists. The paid sum had to disappear somewhere, which once again supports the claim that the system is weak and obscure. Our opinion is that the strict overseeing of usage would cause excess costs for the Union, it would be more cost-efficient in the long term.

5.) The international credit rating institutions which have a serious background of professional knowledge have a too serious influence on the processes and events in the world, however, they're not necessarily worthy of such power. In the case where a nation, be that due to their own irresponsible modus operandi, or due to outside intervention, is rated down, the country in question may find itself in even deeper problems due to that, from where it's even harder to rise up again. Due to their lower rating, the investor trust they previously had will also waver, which causes them to lose exactly the resources which they would need to solve their problems, and redirect their country to the proper path. Due to the narrow breathing room, cutting government expenses and increasing taxes is the only tool left for them, which will lead to the shrinking of their economy due to the decrease in consumption. This, in time, will result in a self-inducing process sinking the country into a long-term low, which could also have a significant influence on the state of the area.

Therefore, the influence of these credit rating institutions should be cut, most notably because as we were able to see, even they are prone to mistakes, and due to their decisions, countries could have their development broken for a long time.

6.) We already analysed the connection between the balance sheet of the country,

and the national debt. We were able to observe that in case of countries, which didn't introduce the Euro yet, they could fight more efficiently against their national debt using the positive balance sheet. This is where we'd also like to highlight that the countries of the V4 have to depend on foreign help not only as far as economy goes, but for their energetic requirements as well. A notable sum of their import is already covered by energy resources, which hides a serious risk in itself: due to how their currency is weakened compared to the Euro, the costs of importing are increased, which may even endanger the supply system of the civilian populace in the long-term. Therefore, we believe that the dependence on foreign import should be decreased by considering renewable and green energy resource subsidizing in a greater detail for countries like the Czech Republic and Hungary, which have a smaller energy demand anyway. This would result in reaching a steady decrease in import rates as well. Furthermore, the higher balance of the country's balance sheet would also help with managing national debt.

7.) In the economies of the V4 countries, the vehicle industry that migrated from abroad in the last two and a half decades may have a too strong influence. The sector which usually covers one fourth of their industrial production helped drag the countries out of the chaos and helplessness in the previous period. Naturally, their distinguished position was aided handsomely by the governments, as they themselves profit from the presence of a car manufacturer, not only the economy.

Though their production indicators are as high as the sky, and they produced exceptional values (Slovakia is the world leader with an annual 180 car / 1000 person), for now, we can be sure that this development won't be sustainable by any manufacturer, due to the expansion tempo being unsupportable. Therefore, we can expect that this tendency will soon reach its peak, and lead to a stop in the economy. This is also caused by the lack of educated labour and experts in Slovakia we mentioned earlier, and the Central European state as well, which was seen as desirable in the past, but became more expensive nowadays.

The years of the recession also highlighted that if a country is too specialised on one sector, they also take on too many risks. The negative effects of this phenomenon was shown to them in the last few years: as their production is mainly aiming towards foreign markets, the demand on said foreign markets decreasing caused their production to fall behind as well. They were lucky that this state of affairs didn't persist for long, and when the current died down, their production capacities could be increased once again. This is a serious question for leaders - finding a new alternative by decreasing dependence on car manufacturing. One example would be electronics, or medicine production, which is still on a level worthy of being international. In order to improve domestic conditions, the agriculture's reinvigoration could also cause an increase in vehicle production: even a less educated mass could be offered jobs in this sector, and the increased production could also indirectly decrease foodstuff prices.

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PEDAGOGY AND PSYCHOLOGY

USE OF QUEST TECHNOLOGY IN EDUCATIONAL PROCESS OF HIGHER EDUCATION

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Annotation. *The article reviews methodology and organizational - pedagogical terms of quest –technologies applications in the college context. Basic attention is spared to the features of construction and possibilities of the use of educational quests during organization of students' studies. The flowsheet of educational quest, its types and algorithm, structural components of quest – technologies is described.*

Key words: *technology, quest-project activity, quest-technology, interactiveness, integration, application.*

Target setting. Educational reforms get through in Ukraine now. They are designed to improve education, in particular, to improve the innovative activities of higher education institutions. According to normative documents today, a policy of accelerated, forward-looking, innovative development of education and science should take place in the country. Modern personality must be provided with conditions for development, self-affirmation, self-realization throughout life and the education system should ensure the formation of a holistic scientific picture of the world, modern world outlook, creative abilities and the ability to independent scientific knowledge, self-education and self-realization of the person capable of creative work, professional development, development and introduction of modern technologies, mobility and competitiveness in the labor market.

State educational standards are realized in the system of education, with system active approach is of top priority in combination with other modern approaches in education (personality-oriented, culturological, etc.). A mission of modern higher education is creation of conditions, that assist to personality development and successful socialization of students, their mastering ability to study and live deservingly, morally, and realize oneself in creative, professional activity. Among requirements to the educational process organizational terms it is possible to distinguish updating of maintenance and modernisation of educational technologies, that it is determined by the modern sociocultural terms of society.

Thus, one of the urgent problems of the educational space is the diversification of

the educational process, the introduction of the newest forms, methods and technologies of teaching, the development of innovation activities.

Analysis of the recent researches and publications. According to many scientists (O. Baguzina, Ya. Bykhovsky, S. Napalkov, etc.), one of the modern innovative technologies that needs to be implemented in the educational process for the comprehensive development of youth of the 21st century is quest-technology.The quest –technologies use is highlighted in a great number of theoretical and empiric researches. The lessons at primary schools [5], vocational training colleges [8], institutions of higher professional education [2, 9] are their subjects. Quest-project activity within the framework of educational establishment has special value [7] as it brings up the personal responsibility; forms the culture of interpersonality relations and tolerance; aspiring is to self-realization and self-perfection. I. M. Sokol offers the detailed classification of educational quests [11], A. F. Levitskaya and H. B. Mykolaieva examined psychological and social-pedagogical aspects of quests application in educational activity [10]. In foreign researches, in particular in the works of Kaivola T., Salomaki T., Taina J. [12] application of quests is analysed, their possibilities for the students of institutions of higher learning. For understanding of quests' specific pedagogical influence, the modern researches appeared in pedagogics on the whole and pedagogical technologies, in particular. Thus, the works of B. I. Zagviazinsky, B. P. Bespalko determine pedagogical technology as rich in content technique of educational process.

The analysis of psycho- pedagogical literature devoted to the problems of application of modern educational technologies allowed us to define their basic descriptions. They are reference-point on the achievement of high educational results, development of reflection and critical thinking; transition from reproductive character to the problem of studies and organization of active cognitive activity of students with support on the their personal experience; integrated character; account in realization of technologies of all types of knowledge (informative, procedural, evaluation and reflective) and them structural components; account of individual educational necessities and capabilities of students, level of their development and health; creation of comfort terms is for opening, realization and development of personality potential of students; assistance to creation of situation of success, as a subjective residence by a human his personal achievements in the context of one's life and individual development; interactiveness and dialogies, motivation to collaboration, joint activity of all subjects of studies; creation of educational products as results of activity of students, maintenance of that answers the investigated object or to educational industry; applications of informative educational resources and electronic media.

Pedagogical arsenal of technologies in domestic and foreign pedagogics that answers the requirements listed above, is large enough, among them are technologies of educational-research and project activity, studies on the basis of social co-operation, development of the critical thinking, problem studies, educational questions, on-line learning, etc.

The processes of globalization and rapid development of technologies radically

changed all spheres of vital functions, including higher education. Competition calls arise up before the system of higher education in the entire countries of the world. Higher education tests permanent transformations for support of ability adequately to answer upon requests of modern society. In particular, maintenance and design of educational space change. "Taking into account the state of world economy, a better formed generation is now needed exactly, than ever before, in the widest and deepest sense of this word" [1].

Raising of the task. New requirements to higher education assume the changes of educational space. These changes touch the objectives and maintenance of education, methods and technologies used. The mass open on-line courses are actively inculcated, as well as interactive technologies, individual trajectories of studies, etc. The participants of educational process are substantially change, too. The generation of young people, coming to the universities today is fundamentally other.

So, a research problem consists in the necessity of new creative educational technologies that, simultaneously will answer the requirements of changeable society, the queries of subjects of educational process, first of all, students of new generation. New interactive methods and forms, creative educational technologies that provide speed of transformations and answer upon the requests of modern and future society, are needed

That is, technologies, that allow to train persons capable under the conditions of global competition to design new types of activity, convert social environment, decide the actual tasks of today's practice and possible problems of the future.

Wording of the research basic material. The new system of education must not only form the certain set of professional integrities in students but also wake up their aspiring to the self-education, realization of their capabilities. One of the major directions of efficiency and quality of specialists training increase is mastering and expansion of forms and methods of interactive studies application. Simple exposition of material by a teacher is a monologue, and for today to take a student with educational process, bring over all educational group to work – is possible only with the use of creative technologies. Among modern technologies with such a potential, we distinguish exactly "quest", that is a new technology of interactive studies that assists activation of interest to learning. This technology can be considered a project-oriented, because during the work upon it, the number of professional integrities develops: the use of information technologies for the decision of professional tasks (students design educational material as presentations, web - sites, flash – reelers, database, etc.); team – work (a close contact is during all quest); skill of public performances (the students acquire it in the process of public defense of the mini-projects prepared) [11].

Considering that "quests" are new in education, first of all, let's consider their characteristics in the aspect of pedagogical innovations, the innovative activity of the teacher of institutions of higher learning. The study of scientific works on the problems of pedagogical innovation (O. Dubasenyuk, et al.) allows us to insist that innovation is a fundamentally new form: a new idea, principle, form, content, structure, etc., which

substantially changes the existing practice. Innovation is something introduced to this system from another or that was first invented. Innovation in education is the process of creating, introducing and disseminating new ideas, tools, pedagogical and managerial technologies in educational practice, as a result of which the indicators (levels) of the achievements of the structural components of education increase, the transition of the system to a qualitatively different state occurs. Essential feature of innovations is their ability to influence upon the general level of teachers' professional activity, expand the innovative field of educational environment in an educational institution.

Therefore, considering the quest as a pedagogical innovation, we must investigate its impact on the educational process, the student's learning and development (in the context of effective changes), as well as pedagogical activity, requirements for the teacher.

Actuality of quests' use is realized by all participants of educational process. A new generation requires the use in the educational process of technologies of strenuous type. It is known that modern students better master knowledge in the process of the independent getting and systematization of new information. The use of quests assists education and development of personality's qualities responding to the request of informative society, opening of capabilities and support of giftedness.

Quests application develops ability to work with information, choose most meaningful, lay out it in one's own words. Work in this searching technology is the interactive form of realization of studies, that allows to satisfy the requirements of the State educational standards of the third generation. Such quests are developed for educational subjects on the different levels of studies in educational process. They embrace a separate problem, content area, theme and can be cross-curriculum.

Just the definition of the quest as a special technology, in our opinion, is the most correct, it does not contradict the logic of scientific knowledge and allows to reveal its essential features. Thus, technology (from the Greek techne – skill, art; logos – knowledge, doctrine) is a collection of methods, means and realization of people of a specific complex process by dividing it into a system of successive interrelated procedures and operations that are executed more or less unambiguously and aim at achieving a high performance of a particular type of activity.

Quest as a pedagogical technology is a model of joint pedagogical activity in designing, organizing and conducting a learning process with well-defined goals, diagnostics of current and final results, which has certain stages with distinct procedural characteristics.

The following types of quests are identified: for a short-term work (the aim: deepening of knowledge and their integration, designed for one-two class exercises); for a prolonged work (the aim: deepening and transformations of students' knowledge, rated at a long-time period, a term, e.g., or an entire training course). The themes must be interesting and useful for students, that everybody could work, realizing the necessity of the problem set up decision. Students' research abilities are formed at this stage of a task performance.

Discussion of the quests work results can be held in the form of a conference, so

that the students have an opportunity to show their job, realizing its significance. Such personal trait as responsibility for the work done, self-criticism, mutual hand-holding and art of public presentations are enshrined at this stage.

Quests-work can be offered as an extracurricular independent task for students. It can be conducted in a study group during coupled classes, which can significantly increase the motivation of students to achieve the best educational results. If the quest is carried out in mixed teams from different training groups, then this team needs initially teambuilding, interaction and cohesiveness exercises to be done that increase the overall results of creative activity.

Quest as a creative pedagogical technology can be used in various aspects: as a form of class conducting it allows students to creatively interact with each other, as an element of control and evaluation tools it allows to check the level of competence.

This form of work allows us to combine scientific, analytical, creative, and design thinking. Another important value of quests is the ability to use interdisciplinarity. When solving problems during the quest, all participants have to actively interact with each other, use the most diverse skills and abilities, life experience, intuition.

Quest's essence is that its participants (students) must solve a problem that has no definite solution, and the sources of information provided are selected in such a way that the problem is considered from different angles, with the information in the provided sources does not give an accurate answer to the question. Quest's participants must take from all the proposed variety of text, graphics and video materials necessary information and formulate their own conclusion.

As a limitation to the use of this method, one can mention the lack of specially equipped premises for implementation, the framework of educational programs, traditional forms of classes (lectures, seminars and practicals), the breakdown between teachers' values and those of the students'.

During the observation of students' work in creative groups, it has been established that quests have a high resource potential and are the most promising creative pedagogical technology for the professions of the future preparing.

Quest technology has an integrated character: quest's algorithm is based in the logic of problem learning – from the problem setting to the ways of its solution, representation of the result and reflection, aimed to the development of a student as an active subject of life. Educational "products" performed individually or in a group as a result of quest can be different. The problem set may be solved in different forms, starting from answers to the questions to the created multimedia presentations, reels, sites, booklets, etc.; use of special computer programs, Internet both at the process of the task fulfillment, and in the presentation of the result of the quest and the exchange of views. The latter characterizes this technology as an information and communication one.

So, the educational quest is an integrated technology that combines the ideas of the design method, problem and game training, team interaction, combines purposeful search, auxiliary tasks with adventure and/or play on a certain plot.

The technological map of the educational quest includes the following elements,

structures and requirements for its development. The name should be short, attractive and original; the quest's direction should be indicated a subject or one of the priority areas of activity, a group of educational subjects and a complex of educational directions (interdisciplinary or integrated quest); objective and tasks – the first is of generalized character, diagnostic, while defining it and objectives the educational standards are guideline; duration – an educational quest can be developed for one lesson, a complex of classes, a week, a month or another time interval (short-term or long-term); age and target group – the account of age characteristics of senior school, youth, adult population) and their educational needs, including specifics of health; the main idea - the task should be of a problem nature, while developing the main task can take into account types of tasks, creative approach and inspiration. Along with the main task the additional tasks of different nature are worked out, it is desirable that among them the problematic ones predominated.

Various hints, labels, landmarks, which facilitate the organization of purposeful search, aimed at solving both the main and additional tasks are necessary. To complete quest various resources can be offered to students, e.g., a list of literature, including Internet sources, educational sites; multimedia presentations; clips, including social ones; electronic gadgets; devices and materials, etc . Criteria for evaluating students' activity are developed by the teacher, depending on the variety of the proposed tasks and the result. Quest result should correlate with the execution of the main task, for example: the problem is solved, the puzzle is solved, the discovery is made, etc. Educational result may be social video, booklet, research results, etc.

An important stage in quest's creation and requirements to it as an educational technology is the development of detailed criteria for evaluating both students' activities and their products. Quest is a complex task, so the evaluation of its implementation should be based on several criteria, oriented on the type of problem task and the form of presentation of the result.

Involving students in quests increases the motivation to study, because applying for really interesting problems for students, creating conditions for self-realization and self-affirmation in the environment close to them, correctly formulated topics and tasks of quests help to develop motivation to study.

Conclusions. Thus, quest-technology as any pedagogical technology has an invariant part, represented by the elements of its structure and the requirements for their content, defined in the technological map. Variance is realized in the work of the teacher, who will develop a legend, a plot, etc. taking into account pedagogical skills, the specifics of learning and the possibilities of an educational organization.

The main functions of quests in the educational process are general motivational, educational, and developmental.

In quest technology as a modern educational technology, all types of knowledge and their structural components must be taken into account, which will ensure the success of the implementation of educational standards and the achievement of the learning outcomes set forth therein. It is also worth noting that as a modern pedagogical

technology, quest solves several tasks.

1) Teaching – everyone is involved in an active cognitive process; individual and group activities of participants are organized; skills and abilities to work independently on the topic are revealed.

2) Developmental – development of interest in the subject of activity, creative abilities, imagination of the participants; formation of skills of research activity, abilities of independent work with information; extension of the horizons, erudition, motivation.

3) Educational – the education of personal responsibility for the task given.

This technology is enormously popular with modern students and is able not only to expand the horizons of learning, but also allows actively apply their knowledge and skills in practice, and cultivate a desire for learning in general. The essence of the quest, as a rule, is that there is some ultimate goal, and to reach it one can only if consistently unravel mysteries and solve the problems. Each riddle is the key to the next point and the next task. And the tasks can be very different: power, active, creative, intellectual. It is attractive for many people that quests can be conducted both in the audience and in the city, in the nature, that is, practically in any environment that solves the task of organizing both classroom and project work. Quest-technology has the structure of its own: goal-setting, planning, goal realization, analysis of results. It is possible to apply quest during all classes, and at its separate stages: at the motivation stage, the stage of actualization of knowledge, explanation of the new material, etc.

Thus, this technology becomes universal for the educational process, which facilitates the task of the teacher.

Considering the quest through the definition of game pedagogical technology, it can be argued that it has "clearly set up didactic task, game plan, leader, clear rules and is implemented to raise students' knowledge and skills" [3, 7, 9].

The prospect of further research we see in the study of other innovative forms of work in higher education institutions.

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CREATION AND USE OF TRAINING PLATFORMS OF DELAY ACCESS AND INFORMATION CONTENTS FOR MANAGEMENT OF SCIENTIFIC-PEDAGOGICAL ACTIVITY OF DISTANCE EDUCATION IN HIGHER EDUCATION

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Annotation. *In the article current trends of distance learning information management are substantiated and determined, the experience of distance learning educational platforms creation and usage management is researched and systematized.*

Basing on the analysis of the experience of distance learning informatization, IT educational platforms and content for high school students' creation and usage, it is generalized that distance learning is: a perspective form and technology of studying process and education efficiency improvement; it shows the trend of educational forms improvement via integrated implementation of interactive training, information technologies usage. The tendencies of the development of distance education are found: the increase in the number of mass open distance courses, the development of distance learning programs, the integration of ICT in distance education, combining the advantages of distance learning with the classical form of education, monitoring achievements of higher education institutions; mobile exchange of industry experience.

It has been established that distance learning actualises the component of professional self-development of master degree students, as it provides the prospect of effective and mobile use of information content and technologies for self-study and formation of readiness for realization of professional competencies.

Key words: *distance learning, interactive, information, telecommunication technologies, management of scientific and pedagogical activity, experimental training, remote access platforms, information provision.*

Introduction. In modern conditions, the use of the information environment and telecommunications in the system of distance learning in institutions of higher education is an integral part of educational process. Creating electronic resources and libraries is a prerequisite for the licensing of specialties in higher education institutions.

Information technology education, as a system of modern information methods and means of purposeful creation, storage, processing, presentation and use of data and knowledge, provides improvement of the educational process at the least cost, opens the

wide opportunities for their use in the system of higher education. This is due to the fact that new information technologies have significant didactic capabilities for raising the level of cognitive activity of students [1].

The further evolution of the high school in more than 50 years from the time when first computers were installed and to the time when the most advanced IT means are used reflects both the achievements of scientific and technological progress, first of all, cybernetics, informatics and ICT industry, and achievements in the appropriate training of teaching and management personnel, the level of computer-based scientific and methodological support of the educational process [2].

The need to respond to human needs and the challenges of society confirms in the public consciousness a new educational paradigm, which is the need for equal access to quality education for all those who are motivated to study, need to learn throughout life and have opportunities. The new educational paradigm has become the reaction of the education system to the challenges posed by the objective processes of the development of society and the emergence in this connection of the new needs of those who are studying or planning to study. This paradigm reflects, "integrates in itself" and forms a hypothetical portrait of open education in which the school and higher educational institutions are regarded as a system of the formation and development of a free person. Open education realizes human rights to freely receive and use information, acquire the necessary knowledge, in general, high-quality education in the modern world. On the basis of this paradigm, a system of modern educational goals is created that predetermine the development of pedagogical systems (first of all, the updating of the content of education, the introduction of new pedagogical technologies used in the open educational process), as well as the development of open-level education management technologies at all organizational levels [3].

V. Bykov convincingly argues that the main directions of further large-scale education and science informatization strategy should include the development of informational-communicational platforms of open educational systems, including open systems of postgraduate education (retraining and advanced training of scientific and pedagogical workers and education managers), that is adequate to time and ICT technology progress [3].

The specifics of education at the beginning of the third millennium impose special requirements for the use of various technologies, since their product is aimed at people, and the degree of formalization and algorithmization of technological educational activities, according to scientists, is unlikely ever to be on the same level with production, which also intensively develops [4].

Modern students are extremely active in using the latest media - television, computers, the Internet. This is due, above all, to the new requirements of a specialist of the 21st century and the new technical capabilities provided by these carriers: rapid access to information, its accumulation and preservation, the speed of exchange of new information materials and the possibilities to create an affordable base for such materials.

Purpose of the research is to justify the creation and application of educational

platform of remote access and mobile content usage from modern information gathering and analysis technologies.

According to the aim, the tasks are defined:

1) to carry out the analysis of trends in the improvement of the management of scientific and pedagogical activity on distance learning and the creation of platforms for remote access;

2) to create an educational platform for remote access and mobile content usage from modern information gathering and analysis technologies;

3) to develop and implement a methodological guide on modern technologies of information gathering and analyzing on the basis of distance learning: check the effectiveness of implementation.

Theoretical foundations of the study. In the conditions of rapid development of modern information and communication technologies, the priority and most important task of higher education is professional oriented training of teachers. But now IT competency is one of the most important indicators of educators' professionalism. Information and communication technologies make the teacher more productive, more creative and flexible in the profession [5].

For a telecommunication environment (in particular the Internet), a customer-server model, which is used in the SCORM standard, is typical. The server in this case is LMS (Learning Management System). The LMS includes a selection of functionality developed for the dissemination, control and management of educational content and learning. This term refers to both simple control systems and complex information systems [6].

One of the indicators of qualitative changes in the system of higher education caused by the introduction of information technologies and distance education into the educational process is the fact that a number of higher education institutions in Europe and the USA are proposing the acquisition of certain professions exclusively in the system of distance learning [7].

Today, distance learning is a way of obtaining education through the use of computer and modern information technologies, which gives students the opportunity to study at a distance, without interruption from work and travel abroad. Among other names of distance learning, such as "open education", "e-education", "virtual learning" [8]-[10] are also used.

Research methods: theoretical - analysis of scientific literary sources, scientific databases to justify the trend of management of scientific and pedagogical activity in providing information support for distance learning in higher education institutions; empirical questionnaires (the author's development of qualitative questionnaire cases for model professional situations), pedagogical observation to determine the effectiveness of the introduction of information support for distance learning in institutions of higher education.

Results of research. The use of informational didactic resources forms an informational educational environment in institutions of higher education, which ensures

the effectiveness of educational processes.

The structure of the SCORM standard combines SCORM Sequencing & Navigation, a description of the rules, and methods for streamlining teaching material, training modules, lectures, seminars, practical and laboratory classes, implementation of transitions within the content; the SCORM Content Aggregation Model includes a description of the content, ways of exchanging information, searching and launching, and streamlining the content used in educational systems; SCORM Run-Time Enviroment describes the requirements for LMS in accordance with the management of the time of launch and data exchange, used for the administration of data exchange and management of the educational process.

In the context of SCORM, LMS applications are widely used. According to the SCORM standard, LMS defines the data and direction of their dissemination, and provides for tracking the user's work with information content. To use the SCORM model, it is possible to create e-learning courses independent of the system itself for reusable use in other systems of remote learning management.

The use of the Internet as the most promising technology of data transmission since the 1980 has dramatically accelerated the informatization of education in the world and provided a huge number of opportunities for improving the quality of education, its flexibility, accessibility for different groups of the population. In this regard, most researchers agree that potentially the richest source of information on the Internet can become undistinguished and focused on narrow subject areas of knowledge, databases and integrated virtual libraries. Among the existing projects of virtual libraries, the "The Internet Public Library" (http: // ipl.sils.umich.edu) contains, besides directories and reference information, more than 7,700 texts available online in separate units (UCLA Extension http: // www. unex.ucla.edu/).

Some tendencies of the development of distance learning are noted, such as the increase in the number of mass open distance courses, the development of distance learning programs, the integration of ICT in the educational process of distance education, combining the advantages of distance learning with the classical form of education, monitoring achievements of higher educational institutions not only within Ukraine, but also all over the world, further use of useful experience.

Distance learning, also called distance education, e-learning and online learning, is a form of training in which the main elements are the physical separation of participants in the educational process during learning and the use of different technologies to facilitate communication between students and teachers, students and students. Distance learning traditionally focuses on non-traditional learners such as company employees, the military and non-residents, or individuals in remote areas who cannot attend classroom lectures. However, distance learning has become an acknowledged part of the modern world educational process. There is also a trend illustrating the constant increase of remote forms usage. Only in the USA higher education over the last decade the number of distance learning students has increased by more than 5.6 million.

Different terms are used to describe the phenomenon of distance learning in

scientific literature. By systematizing the use of distance learning (student activity) and distance teaching (activity of the teacher), it should be noted that they together constitute a distance educational process. Typical options include: e-learning or online training that is used over the Internet; virtual training, which usually refers to courses that go beyond the classroom (also commonly used by the Internet); correspondence education, multi-year method in which individual training is carried out by mail; and open learning, a general education system through an "open" university. Four characteristics are specific to distance learning. First, distance learning is by definition carried out through institutions; it is not an independent learning or learning environment. Institutions may or may not offer traditional lessons, but they have the right for accreditation as educational establishments that use traditional methods. Secondly, geographical separation is inherent in distance learning, and time can also separate students and teachers. Accessibility and convenience are important benefits of this type of education. Hard programs can also be not effective. Thirdly, interactive telecommunications connect people as part of a training group and with a teacher. Electronic communications, such as e-mail, are the most commonly used, but traditional forms of communication, such as the mail system, can also play a role. Regardless of the environment, interaction is important for distance education, as well as for any education. The links between participants in the educational process and learning resources are less dependent on physical access, as communication systems become more sophisticated and widely available; consequently, the Internet, mobile phones and e-mail facilitate the rapid dissemination of distance learning.

Finally, distance education, like any education, creates an innovative educational environment in which information resources are selected and structured.

Distant education combines educational groups of participants in the educational process within higher education institutions into a learning community, which consists of students, teachers and teaching resources that form electronic databases and include lists of electronic content of scientific periodicals on the development of science and technology in the field, electronic books and methodology documentation in educational disciplines, which in turn combine electronic methodological developments, audio, video and graphic displays that allow students access to educational content.

It is anticipated that by 2020, each distance learning or training program leading to a certain academic qualification will be available in three different modes: in part, full-time and distance learning. The main feature is that it is possible to describe distance learning as a learning method that provides educational services for students in another geographical location.

This form of education increases access to learning resources and expands opportunities for people who cannot attend regular classes daily, as well as those who have financial constraints. In addition, distance learning is a choice for people who want to expand their knowledge to enhance their careers. In general, it helps students to balance education with a career, family, and everything else that they do in life.

In university education in Ukraine, distance education is used as one form of learning that complements the classroom and improves the efficiency of educational process with

the use of interactive information and telecommunication technologies.

For an integrated combination of forms and methods of teaching in the system of higher education on the basis of pedagogical innovation and the improvement of the organization of distance education in Master degree programs, we did an integrated implementation of training platforms of distance learning (Voskoboinikov S., Melnyk S., Stupak D., 2017-2018). We also made online lectures, covering problematic issues, online courses with audio materials and practical tasks.

On the example of the practical application of the "Modern technologies of information gathering and analysis" for distance learning of Master students, the effectiveness of the implementation of information content has been investigated. Information content of the NMC includes modules: Module 1 – Methods and tools for finding information on the Internet; Module 2 – Methods and means of automated data processing; Module 3 – Methods of preparation of analytical documents; Module 4 – Methods of information security when working in social networks, as well as cases of applied model situations solving professional tasks for the security of corporate information systems for training competency.

It has been implemented into educational process the EMG "Modern information gathering and analysis technologies" and experimental training on dealing with security issues in corporate IT systems. After the completion of the experimental study, a questionnaire was conducted (the author's development of qualimetric questionnaires for self-examination of readiness for the implementation of professional competencies in information and cybersecurity in accordance to cases of model professional situations).

According to the results of pedagogical observation and determination of the effectiveness of the introduction of information provision (EMG) of the subject "Modern technologies of information gathering and analysis" for distance learning of university students, it was established that 100% of the students of the experimental group used the information content (theoretical sections of modules), 89% applied model situations solving professional tasks for security of corporate information systems; 11% of respondents passed three levels of situational tasks.

After the completion of the experimental study, a control section of students' academic achievements was conducted in solving professional tasks for the security of corporate information systems. Students in experimental groups after solving problem cases showed following levels of readiness for the implementation of professional competencies in information and cyber security (Fig. 1): reproductive – 2%; functional – 34%; productive – 47%; creative – 7%. Respondents who did not completely solve the case (2%) found motivation for self-study and re-passing of educational coerces.

The educational achievements of the students of the experimental group confirmed the effectiveness of the implementation of the NMC, since the students of the control groups who studied only in the class and did not use the information support and remote access in the process of self-education showed the following level of readiness for the implementation of professional competences for information and cyber security: reproductive - 18%; functional - 57%; productive - 24%; creative - 1%.

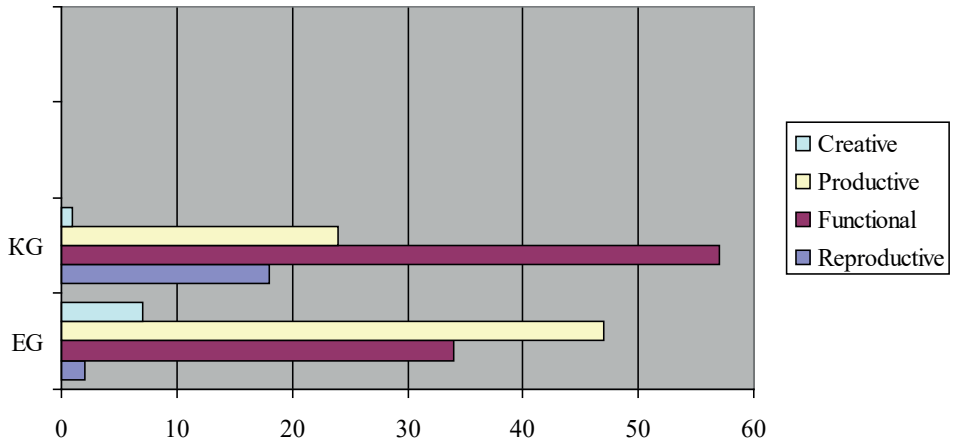

Fig. 1. Results of academic achievements of students in solving professional tasks of security of corporate information systems.

Conclusions and prospects for further studies. After analyzing the experience of distance learning information support, distance learning educational platforms and information content creation and application it is necessary to summarize that distance learning is at the same time a promising form and technology for raising the effectiveness of the educational process and the quality of higher education, reflects the tendency to improve forms and means on the basis of comprehensive introduction of interactive training, information and telecommunication technologies.

Distance education development trends have been discovered: the increase of the number of mass open distance courses, the development of distance learning programs, the integration of ICT in the educational process of distance education, combining the advantages of distance learning with the classical form of education, monitoring achievements of higher education institutions; mobile exchange of industry experience.

Consequently, distance learning actualises the component of professional self-development of high school students, since it provides the prospect of efficient and mobile use of information content for self-study and formation of readiness for the implementation of professional competencies.

Based on the results of the analysis of trends in the improvement of the management of scientific and pedagogical activities in distance learning and the creation of platforms for remote access, an educational platform for remote access and mobile content usage from modern information gathering and analysis technologies has been created. The educational methodological guide of modern technologies of information gathering and analysis on the distance access training platform was developed and implemented; the efficiency of implementation was checked. According to the results of the processing of qualitative questionnaires for students' self-examination positive dynamics of readiness for realization of professional competencies in informational and cyber security has been

discovered in accordance to cases of model professional situations.

Further research directions prospects cover the improvement of the design of development of information support for remote access platforms in the system of vocational training for the formation of professional competence of students in higher education institutions.

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FEATURES OF THE INFLUENCE OF THE MACRO ENVIRONMENT ON THE WRITER'S ORIENTATION OF HRYHIR TYUTYUNNYK (BASED ON THE WRITER`S MEGATEXT)

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Annotation. *The article attempts to determine the influence of the macro environment on the writer's psycho structure. The adverse factors of the psycho-emotional state of the artist caused by the influence of the microenvironment are analyzed. The features of the expression of individual elements of the macro environment in the artist's literary work are determined.*

Key words: *psycho poetics, psycho structure, megatext, orientation, macro environment, the sixties.*

Introduction. Literary scholars have determined that the writer's psycho-education combines the features of the inner world, the experience of certain life circumstances, social characteristics, and the realities of the society of the historical epoch in which the artist lived. Robert Wood also pointed out that "a literary work directly reflects the world in which the author lives" [6, p. 99]. Sandra Gilbert and Susan Gubar's arguments are consonant with Wood, which state that "a literary text is an expression of the author's consciousness and feelings, and these consciousness and feelings are formed by personal experience" [6, p. 99]. Serhiy Myhyda is convinced that "it is quite obvious that the artist's psyche organically combine the societal [...] external, acquired in the process of active (or passive) stay in certain circumstances of life: a family and the environment; and personal, internal, as a complex of conscious and unconscious inclinations, motives, emotions "[5, p. 277].

Scientists (R. Zazzo, M. Malkov, B. Teplov, and others) determined that "not all social conditions affect the child's mental development directly, but only those he comes in contact with" [7, p. 138]. It is quite logical to say that the influence of social conditions under certain circumstances can be one of the factors of the psycho-emotional state of the individual. Of particular interest is the influence of the adverse conditions for the formation of the personality, especially the psycho-structure of the creative personality. The question of the influence of external factors on the literary orientation of artists is considered by literary critics narrowly and is reflected in the scientific revisions of Y. Gladyr, A. Kumkova, S. Myhyda, A. Rybas and others. In our opinion, it clearly demonstrates the influence of the macroenvironment on the artistic work of the mega-text of Hr. Tyutyunnyk.

The purpose of the article is to determine the features of the macro environment of

the writer and to study their influence on the creative orientation of the artist. A psycho-poetic model of the analysis of the writer's megatext will become the methodological concept.

Presenting main material. Indisputable influence of micro and macro environment on the psychic world of Hr. Tyutyunnyk is confirmed by the majority of researchers of the artist's life and creative heritage (N. Zborovskaya, A. Nezhivoy, A. Remsha, I. Starovoit, L. Tarnashinskaya and others). We refer the nearest environment to the microenvironment -the family. Macromedia is interpreted by us in a broad sense as a complex socio-political, socio-economic and ideological system. Difficult financial situation in which Hr. Tyutyunnyk appeared, de-Stalinization on one hand, and constant control of governmental authotity on the oher slowed down spiritual development of the individual and developed a mistrust to government. We note the thesis of K. Marchuk, which exploring the secrets of literary talent of Hr. Tyutyunnyk, the artist's macro- and microenvironment notes: "The combination of innate instances and favourable social conditions in childhood, in particular, ensuring freedom of thought and choice, gave a powerful impetus to the development of the artist's talent" [4, p. 9] (Emphasis is ours. – Ya. D.) In our opinion, the author's statement is controversial, because the artist's childhood period was designated "the Stalinist regime". Therefore, social factors (loss of father, insufficient attention of mother), coming into conflict with social conditions (war, lack of money, forced migration of villagers, manifestations of bizarre freedom, the cult of the "great man") became the main factors of nonconformity as a behavioral writers` style of the Sixtiers. "Sixtiers, by definition of I. Zhilenko, was the resistance movement of the intelligentsia with the spirit of rebellion that united completely different people both in the manner of versification, and in the genre, and even in the cause of activity " [2, p. 18]. Thus, the assessment of society and authorities, observation of the rebirth of the human essence, where material needs become higher than spiritual ones, immersion in public life is rethought and reflected in the megatext of Hr.Tyutyunnyk. Capable of self-deepening, in his literary works he tried to highlight the problems of the political engagement of society, the opposition "village – city", the lack of spirituality caused by the prevalence of material values; child psychology in extreme situations.

The artist's reflections on society in general and the essence of the individual in particular acquire a special sensation. The diary entry number 4 (Oleksii Nezhyvyi) helps to follow the artist's attitude towards the political structure of society: "The fact that the era of Stalin was cruel is scary. But more terrible is that it gave rise to pharisaism. The fear of cruelty may disappear after the death of the tyrant pharisaism remains for a long time " [8, p. 327]. Despair due to the lack of talent of politicians can be traced in the artist's diary: "To evaluate every leader of all nations there are two criteria: 1) how deeply and truly a leader understands the interests of his people and 2) how vigorously he works for the realization of these interests. A model of such a leader was not known in history before" (underlining is Gr. Tyutyunnyk) [8, p. 230]. From the memoirs of the writer's contemporaries we are convinced that Tyutyunnyk was against the totalitarian government, against the cruelty that it gave rise to, blasphemy, betrayal, deaths of

innocent people, bloodshed. As P. Maleev recollects “Hryhor put love to a man most of all in life” [1, p. 329]. Both in letters and diary entries we find certain assessments of society, the nation, the existence of a person. In a letter to M. Steblyna since August 20, 1970, the writer shares his thoughts about the goal of life: “there is perhaps no concrete, common sense of life common to everyone, but there is one for everyone on this beautiful face of eternity. For each its own meaning, because everyone knows that he is not eternal, and everyone wants something of his own weather it is big or small. Perhaps it seems to everyone that it is great. A perfect diception ” [8, p. 118]. Later, the artist confesses: “My soul never shatters while there is a goal in my life. While there is heat in my rebellious blood, there is a thunderstorm and a youth trilling flows ” [8, p. 278]. Therefore, as long as there is a goal which the writer seeks throughout his life, until then he lives.

Peculiar to the characters of Tyutyunnyk is the idea of happiness. So, the understanding of happiness for Mykola (“My Sabbath Day”) logically fits into the minds of the Sixtiers: “I even pity him (Ivan Zakharovich. – Ya. D.), humanly pity, because he does not know how easy a person is given happiness, if he does not invent it himself, does not reach for it with the last of his strength, but feels free to him, like air and water. And I had it, that happiness. As you carry hot potatoes in your pockets, you warm your hands by it - and you are already happy with its warmth. As you go to the meadow to get some wood, you will certainly find such a strange stump, similar to everything in the monster's world at once, you just have to not be too lazy to go around it and take a good look, because it is different on each side and already happy with the spectacle ” [9, p. 482 – 483]. As you can see, happiness is actually in simple things: in baked potatoes, warmth and comfort at home, which was not enough for children whose fate was marked by war.

Social processes did not pass unnoticed. Thus, in the story “The Siege” through the lips of Kalyuzhny, the writer assesses the authorities that caused violence, discord and blood: “War, Kostya, and all other dangerous and fearful periods in people's lives [...] are awful because of taking self-sacrificing people away, living according to the principle: “If I am only for myself, then why am I even?” And the petty, egoistic, cautious for the sake of himself and only his own interests — philistine, better adapted to life, has a more developed instinct for self-preservation. Any violence over the human spirit and body is the best fertilizer for the average person, the same as manure for a worm, a favorable atmosphere for its approval and prosperity [...]. Mankind knows the theory and practice of the class struggle. This discovery is great. But it still does not know either the theory or the practice of dealing with the man in the street, because it is not a class, not a specific social unit, but a social type. Let us liquidate the average person, the conditions under which he multiplies, that is, violence, and then we, the people, can say: we have finally overcome the beast in ourselves ” [9, p.168 – 169]. The history teacher Mykola Hordiievych (“My Sabbath Day”) reflects on the war: “After the war, a respite, while the children grow into soldiers; after a respite – war. Then humanity seems to be an eternal schoolboy: barely having time to understand their mistakes, the old generation dies out, it is replaced by the young generation and begins those mistakes from the beginning ...” [8, p. 476].

The writer portrays the highest level of hypocrisy of power in the short story "Medal". The atmosphere of being of a person is depictred through the image of the mold by the author in the house of Danko, the coldness that the main character experiences and the feeling of hunger that the best cattle breeder is trying to cope with. A literary device of contrast emphasizes the "simple man – system" conflict, underlining the futility of the "For Labor Prowess" award. Seven people gathered in Selstroy; the stage and the table covered with a red tablecloth, laudatory speeches in honor of Danko and a brilliant medal were solemnly lit – and as a contrast the peasant's greasy clothes: "The ombudsman took out a brilliant medal from a small blue box and pinned it to Danko's greasy sweatshirt" [9, p. 378]. Going home, Danko took off a medal that did not hang, but moving on a sweatshirt. When he got home, the man put the award into the cupboard, where were other awards, after all, the medals did not warm from the cold, and did not protect against starvation, and "froze old fingers like ice floes" [9, p. 378]. The author, as in most stories does not express directly his attitude towards authorities, but through details, strokes in the descriptions of nature, the interior, through the prism of the experiences of one person, tries to convey the general atmosphere of the whole society.

In the story "On a burning waste", the author does not give a direct assessment of the war, but shows its consequences instead: the disability of Fedir Nestorovych, the death of his son and the forced departure of his daughters and a wife to Germany. War is common to Fedir and Makar and the memories of it. Although now in the stories about these events there was "neither tragic revolutions, no sighs, there was only the old power to remember everything as it really was" [9, p. 42]. Yet the tragedy lies in the fact that the lessons of history are not learned by the new generation. The memory that must absorb the events of the war and follow the example of the slogan "Never let this happen!" leaves the younger generation. But Fedir Nesterovych does not blame the children for this. Only despair, longing and pity embrace him, because they failed to preserve the memory of these events, learn to remember the heroes, appreciate the victory. Therefore, at first glance, the story simple in its plot is biased by the spirit of preserving historical memory, human centrism. A. Korabliov and S. Klimenko point out that the artist uses a seemingly simple, and in fact, a deep artistic form that "makes the measurement of fate, inseparably connected with the fate of the people, a unit of measurement, solves complex philosophical questions of time through masterful reproduction of the character's psychology, spiritual development " [3, p. 340].

Describing war, hunger, human relations, experimenting, Hr. Tyutyunnyk each time presents the plots in a new way, sometimes, at first glance, without even focusing on the events of the war. A striking example of the demonstration of the post-war hard times is the short story "Miracles", which has the form of a letter written by the watchman Musii Prykhodko to the commander asking for assistance in providing the car. After the war, many men were crippled as Musii was. "In this war, his leg was beaten off [...] almost up to the hilt " [9, p. 61]. In the letter, Musii described all his beating, physical examination and conclusion: "The machine is writting to you, comrade Prykhodko, it is not shown, due to the fact that the stump is two centimeters longer than necessary. We need fifteen,

and you have seventeen" [9, p. 63]. The author does not demonstrate his attitude to Musii Prykhodko or the leadership, because Musii is not offended, it even seems that the reason for writing the letter is that he was given an answer very quickly and now it is not interesting to live. Although the letter was written with kindness, with a hint of irony, the key question is his, addressed to all managers, the system: "Why, should I cut off these two centimeters, or what?" [9, p. 63]. And this is not irony, but rather sarcasm.

The influence of the "system" on the identity of Hr. Tyutyunnyk is demonstrated through the allegorical image of the "Chevalier" a deputy commander Valerii Maksymovych ("Death of the Chevalier"). The artist reproduces one day from the life of students in a vocational school. The prose writer succeeds in characterizing the behavior of the characters in the story (Yigorko Chovnovyi, Vasyuta Skorik, Valerii Maksymovych, master Poluliak) and portrait details to recreate the spirit of the epoch. The absence of dogs also indicates the post-war years: "as far back as the Germans shot, they still did not multiply" [9, p. 70], and the quantitative predominance of women, young girls, and the difficult financial situation of people (in the morning the students sold dried rations of bread to the women behind the monument of Stalin (Emphasis is ours. – Ya. D.). Despite the detailed description of the half-starved existence of children, lack of clothing, injury to men, physical exhaustion of women, the author's attention above all, is riveted on the inner world of the characters, namely: the ability to preserve good human traits in extreme situations, to preserve the human essence, despite being in political loop. In contrast to Yigorka, an honest and kind guy, the older, but cowardly Vasuta is depicted: "he always catches up, because he himself is afraid to walk. So he is only a SELF-hero near a village building ... " [8, p. 70]. Testing the characters on moral stability, the author succeeds in determining the social spirit, as noted by A. Korablieva, "terrorized by fear, when the instinct of self-preservation of its members gives rise to meanness and betrayal" [3, p. 343]. Meanness is in the act of Vasiuta Skoryk, the head of the group, who slandered Igor for what he wanted to curry favor with the authorities, because the administration still needed to find and punish the guilty. The crucial events in the history of society serve as a kind of test of the spiritual strength of the characters. Valerii Maksymovych and master Polulyak did not pass the trial. After the conversation between the authorities and Valerii Maksymovych, the political officer did not withstand the onslaught, the self-preservation instinct won. Fear overcomes and the wizard Polyulak, when he clamps his mouth with Yigor's hand. "The test of pain completes the story, because the actual post-war childhood, full of children's sufferings undoubtedly led to this" [3, p. 344].

Appreciating the freedom and independence of man, Hr. Tyutyunnyk remains burdened with clerical work, reports, notes, hierarchy in a relationship where the boss is an ordinary person who for some reason considers himself taller, better, smarter than others. Working in many publishing houses, the artist had the opportunity to study various types of creative individuals who were writers, or considered themselves as such. But Hr. Tyutyunnyk was convinced that regardless of talent, everyone must be a MAN. In a letter to P. Gavrylov Hr. Tyutyunnyk complains about the hierarchy of relations at work

and the unnecessary scribbling of “those stupid hierarchical relations between teachers, head teacher, director, built on purely intellectual moral scum [...]. I do not like reports, the rape of my knowledge by methodological juggling, which is now fashionable; I don’t like to look for the proposals of ultramodern content in the newspapers in order to drive the student into the head with a language pattern and a truism ... ” [8, p. 95]. A similar attitude to clerical work is also found in the character of the story Mykola (“My Sabbath Day”). He also disliked hierarchy in relationships and patterned work. There is an episode in the story when a young teacher studied the behavior of Olexandr Pavlovych, the head of personnel, who was following peple that were late for work. And Mykola was late on purpose and “not because he was waking up or walking slowly, but for the sake of entertainment” [9, p. 476]. Once he was deliberately late and copied the actions of Olexandr Pavlovych to show the meaninglessness of his work.

Mykola`s philosophical reflections on his life, the fate of society are significant for a psychoportrait of Hr. Tyutyunnyk and accordant with the position of the author. In the literary work, the perceptible essence of existence for the main character: life is a game. Mykola explains to Myron: “It seems to me that all people are actors. And the farther we move away from our ancestors, the higher our acting skills are. Especially from an early age because of our old age, we get tired of playing or are disappointed when we realize the futility of our acting ”[8, p. 487].

Conclusions. So, the analysis of the megatext through the prism of the psycho-poetic matrix showed that the macroenvironment has a significant impact on the psychostructure of the personality. Hryhir Tyutyunnyk reacted sharply to the problems of politics, morality, family and being in general, which found expression in his artistic works. In the megatext, directly or indirectly attitude of the writer is notably felt towards life and death, religion, problems of war and discord. Further study of the influence of the macro environment on the personality and poetics of the artist’s works determines the prospect of further research.

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USING OF ELECTRONIC DAYS OF PRACTICE WITH GOOGLE TABLES AT THE HIGHER EDUCATION INSTITUTIONS

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Annotation. *The article deals with the issues of introduction of "electronic diaries of practice" as a pedagogical tool in the use of cloud technologies in the system of higher education, mainly artistic and socio-cultural orientation. It emphasizes their exclusive role in increasing self-organization and motivation of student discipline, distribution of load, avoiding the problem of preparation of reports, positive impact on improving the quality control of practice. It is concluded that the attraction of such an instrument, which is carried out on the basis of cloud technologies, optimizes and improves the organization of practical training of competent specialists in the artistic and socio-cultural spheres.*

Key words: *higher education, professional competence, practical training, cloud technologies, electronic diaries of practice.*

Relevance of research topic. Higher education in Ukraine at the beginning of the 21st century, while focusing on complex transformational and modernization processes, is undergoing a new stage of its development, which is associated with a flexible staffing system. In particular, this stage is due to the formation of a market economy and civil society. Innovative changes in recent years have led to a change in the nature of the relationship between higher education institutions (HEI) and enterprises and organizations of different forms of ownership in the training of specialists. Problems with the state division of graduates have caused serious social problems that are directly related to the threat of unemployment for graduates and young professionals. As a result, a significant number of graduates, including those who graduated from the HEI under the prestigious specialties of today, remain unclaimed.

This tendency once again confirms the obvious fact that representatives of enterprises and organizations, their demand dictates the logic of the labor market, and not the labor exchange or recruitment agencies. In the educational plane, this involves reorienting the HEI, in accordance with the competence-oriented approach, for the formation of students of professional competencies [5; 7; 8], which, in turn, determines the implementation of an individual educational strategy for a future specialist in their field. On the example of higher cultural and artistic education, in the system of which the author works, the increase of the subjective factor during the training of a specialist is especially noticeable. Along with the revision of the content component of higher education from the point of view of humanization, humanization and cultural creativity, the question of a fundamental change in approaches to the organization of the educational process in HEI, which should be focused on the formation of a specialist of a new type, acting as

the subject of "crystallization of practical socio-cultural innovations and intercultural interaction "[3].

In this regard, practice is an integral part of the integrated system of organization of the educational process in the HEI. It is a system-forming component of the professional training of a future specialist, since it allows the student to practice their own forces in the chosen profession, to learn to apply in the professional activity the knowledge that was gained at lecture classes. It is in the process of practice that all other methods and techniques for the formation of professional knowledge and skills in the field of culture and arts are tested and filled with meaning. And especially when it comes to modern multidimensional informational and educational space, students' training should take into account the innovative and informational and technological processes taking place in the system of vocational education. Among these processes is the introduction and application of cloud technologies, which, complementing traditional forms of education, is a new stage in the development of education, an economically advantageous and flexible way to meet the needs of those who are studying.

This should include the use of "electronic diaries of practice", which, with the support of cloud technologies, are an effective means of optimizing the process of passing the practice on the path of professional competence development. Taking this into account, the purpose of the article is to analyze the implementation of "electronic diaries of practice" using cloud technologies, in particular Google tables, in the HEI of Ukraine at the present stage. The mentioned goal is realized in the following tasks: firstly, to clarify and analyze the importance of practice in the process of forming the professional competence of the graduate, and secondly, to specify and understand the concept of "cloud technologies" in the educational process of HEI, and third, to describe the application of "electronic practice diaries "With the support of cloud technologies in the higher education system.

Analysis of research and publications. Recently, in Ukrainian pedagogy, the competence-oriented approach, especially in the system of higher education (V. Andrushchenko, I. Bekh, O. Gur, V. Kremen, V. Ognevyuk, V. Semichenko, S. Sysoev , O. Pechot, etc.). Particular attention is paid to the formation of professional competence, an integral segment of which in the twenty-first century it is the ability to use cloud technologies for educational and didactic purposes (T. Arkhipova, O. Voronkin, L. Denisova, T. Zaitseva, O. Kuzmina, N. Morse, E. Smirnov-Trybulsk etc.). Taking into account the aforementioned aspects, in the context of the Laboratory of Professional Practical Training of the Faculty of Directing and Show Business at the Kyiv National University of Culture and Arts, for the first time, it was suggested that the use of "electronic diaries of practice" with the introduction of cloud technologies, accompanied by the application of this innovative approach with theoretical reflections.

Presenting main material. Today higher education throughout the world undergoes significant transformations, one of which is the movement from universal education to the professional side. For example, in the USA, where the initiative model of entrepreneurship is presented, the emphasis on professional education has been present

for a long time. In the European universities, in connection with the Bologna Agreement, a transition to a more general model of education is also being made. The introduction of a two-tier system will allow the effective synthesis of the universal component of higher education and its professional component when, at the level of the baccalaureate, the student receives the necessary universal knowledge, skills and abilities within the chosen direction, and at the level of the magistracy the professional segment dominates. In combination, they form competence in the general cultural and professional aspects.

Competencies characterize the student's ability to apply basic and other skills in situations that usually arise in everyday life [11, p. 141]. With regard to the competence of the graduate of the HEI, this is primarily his ability, supported by practice, to realize his potential (knowledge, skills, experience, personal qualities etc.) for the purpose of successful creative work in the professional and social sphere. Usually the term "competence" refers to the possession of methods of action with a specific object, which ensures the productive performance of a specific activity. At the expense of the term professional competence, then under it means an integrative characteristic of personality traits, the result of training graduates of higher educational institutions for the implementation of a complex of types of professional activities and solving professional problems. That is, competence is a separate element in terms of competence, and professional competence emerges as the result of interdisciplinary system integration of all components: goals, outcomes, content and implementation of the educational process.

The general purpose of the practice, noted S. Akutin [1, p. 724], can be formulated as the formation of professional competences of a future specialist of humanistic orientation. Based on this, one can determine the main tasks of the practice in relation to the cultural and artistic sphere:

- firstly, gaining a deeper knowledge of current topical trends in the field of culture and art, existing traditional and innovative methods, the forms and technologies of working with different target the audience, depending on the subject area (choreography, cinema and television, theatrical art, show business etc.);
- secondly, transformation of the received knowledge during theoretical assimilation of the material into practical-oriented activity;
- third, the formation of an individual professional trajectory for the development of students, which is essential for future independent practice;
- fourth, the formation of general cultural and professional competences, which in the future will allow you to effectively test your bachelor's knowledge and skills in the field of culture and arts.

Thus, the core of professional activity of students in a higher educational institution is practical activity, which can be realized on the basis of enterprises or institutions, state and non-state ownership organizations. Culture as an independent branch of social construction includes a wide range of state and public bodies, enterprises, institutions, organizations, institutions. This branch includes:

- theatrical, musical, choreographic, fine arts and crafts, variety and circus art;
- concert organizations, museums, libraries, cultural buildings etc.;

- cinematography; television and radio; publishing, printing and book trade.

There is a problem of organizing practical training of students, establishing close cooperation between HEI and enterprises or institutions, organizations in which students have to practice, use of active means of acquiring practical skills and abilities, use of effective organizational tools for managing the process of practical training of specialists for different areas of cultural and artistic or socio-cultural spheres.

Graduates of HEI must be competent specialists with profound professional knowledge and advanced technologies. There is a need to create an instrument for dialogue between the higher educational institution, the student and the base of the industrial practice. The features of cooperation between educational institutions and practice bases are determined by the specifics and peculiarities of their organizational structure and social functions in various spheres of art. It is very important to familiarize with all stages of the management of cultural and art projects during the course of the course: project planning, development and writing, budgeting, which corresponds to the objectives of the project, selection of necessary specialists, development of a project monitoring plan, project execution, final evaluation and reporting preparation, etc. Knowledge and skills acquired during practice allow using a result-oriented management approach and, at the design stage of the project, weigh its influence on the community, the specific sphere and society in general.

Therefore, HEI must take into account the wide scope of activities and formulate their practical tasks in such a way as to provide as much as possible the necessary amount of theoretical material and experience of practical implementation with a high level of students' fulfillment of qualification requirements that would correspond to their academic period (type of practice).

An important and necessary tool for students' professional and practical training, which is realized during the implementation of practical work and passing all types of practices, is the use of cloud technologies in the educational process of information technology. This is a paradigm that involves remote processing and storage of data, as well as technology that provides users of the Internet access to resources located on the server and the use of software as an online service [9, c. 45]. If there is a connection to the "World Wide Web", then you can perform complex calculations, process data using the power of the remote server.

In scientific circulation, along with the concept of "cloud technologies", we also encounter other tangible concepts - "cloud services", "cloud computing", "cloud storage", "cloud platform" etc. The key point here is the notion of "cloud", which is understood not the Internet itself, but the server or network, which stores data and applications that connect to users over the Internet. It's about a large number of easy-to-use and accessible virtualized information resources (equipment, development platforms, and / or services) [6], about a complex infrastructure with a large amount of technical details hidden in the clouds [10].

Among the most common educational services and systems are called Black Board, Moodle, Microsoft Live @ edu, Google Apps for Education, Google Groups. The

professor of occupational safety can use the following cloud technologies:

- web-applications for training;
- online learning services;
- file repositories, file sharing;
- systems of distance learning, libraries, libraries;
- resources for collaboration; and of course, the electronic journals and diaries [4], which will be discussed below.

Using the potential of the "cloud" depends on the model of its implementation and can be internal or external. It can cover areas, cities, regions, bringing the whole infrastructure to one standard, which is important for the education system in general, as it ensures its convenient management and reduction maintenance costs: if you consider the context of a higher school, then it is important to understand that "cloud computing" is used to improve the learning process, support traditional forms.

The development of cloud computing (leading providers of servers, Azure Services Platform, Amazon Web Services, Google Apps Engine, Salesforce.com) can create a local "cloud computing" for an educational institution, including higher education institutions, in order to use its resources in accordance with modern educational requirements. Installed local level, in fact, enables the cloud-oriented learning environment within the higher school, which requires the understanding of an artificially constructed system that provides learning mobility, group a half-staffed faculty and students, uses cloud services for effective, safe achievement of didactic goals.

The organization of the educational process using cloud computing technologies, as noted by T. Arkhipova and T. Zaitseva, has advantages, including: using modern technologies in the field of information technology for the presentation of educational material; division of educational material into logical subdivisions; individualization of study taking into account student's abilities and abilities; control by the teacher of the educational process at all its stages; the student's choice of the methods of teaching that are most useful to him; self-control by the student; accustoming the student to independent work [2, c. 106].

The cloud technology system includes the Google Tables service. With their help an information platform is created, within which it is possible to work, to edit information together with colleagues (teacher, student, base of practice etc.) simultaneously and in parallel in real time. Providing access for certain participants to a certain part of the information. Discussion of information through chat and comments. All the changes made by the participants in the dialogue are automatically saved, and in the history of changes you can always view the previous versions of the table, sorted by date and author.

In support of the effectiveness of using the potential of cloud technologies, it should be emphasized that after the completion of the practice in the 2016-2017 academic year, the "Laboratory of Professional Practical Training" of the Kiev National University of Culture and Arts was invited to practice curators and students to start the "Electronic Diary" with using Google tables. In Google, an account was created for the use of

participants in the undergraduate practice - students of the academic group, university administrators, department, practice base. The account has created folders that contain all the information you need to work - the Practice Program folder, the Practice Diary Rules folder, the Academic Group's E-Diaries folder, which creates an application to each student for each student using the spreadsheet. Practice Diary, "Calendar of Events" and "Recommendations for the Practice Report".

"Electronic Diaries" were created to increase the self-organization and motivation of students' discipline, load distribution, avoidance of the preparation of reports and diaries, to improve the quality control of the practice, which laid the conditions for daily monitoring of the process of student practice in the workplace, the implementation of communication.

Part 1

<table>
<tr><td rowspan="5">Photo of the student</td><td>Name and surname</td><td rowspan="5">Additional information about the student</td><td>manager's name of the university's practice</td><td rowspan="5">Additional information about the manager of the university's practice</td><td>manager's name of the practice from the practice base</td><td rowspan="5">Additional information about the manager of the practice base</td></tr>
<tr><td>Course, title and group number</td><td>position</td><td>position</td></tr>
<tr><td>telephone number</td><td>telephone number</td><td>telephone number</td></tr>
<tr><td>e-mail</td><td>e-mail</td><td>e-mail</td></tr>
<tr><td>Link to pages in social networks</td><td>Link to pages in social networks</td><td>Link to pages in social networks</td></tr>
<tr><td rowspan="6">Logo of the practice base</td><td colspan="6"></td></tr>
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<tr><td colspan="6">Telephone numbers of the practice base</td></tr>
</table>

An analysis of the use of "electronic diaries" has shown clear benefits for both students and teachers. Students who used the Google spreadsheets filled out the "e-diaries" of practice every day and had the opportunity to inform the curators of practice at the university and managers at the practice bases of the program and individual practical tasks. Teachers had the opportunity to get complete information about the individual plan of the student's work, his tasks and responsibilities as determined by the practice base, to analyze their compliance with the practice program, to quickly and timely gather the necessary information about the outcome and quality of the tasks performed by the students, wherever they were (the main thing is access to the Internet). The conditions for a permanent dialogue between a teacher and a student were initiated, when the latter,

coming responsibly to use Google spreadsheets, was able to constantly receive advice, advice, and better perform their tasks. As a result, a high score of the work performed and a positive characteristic from the bases of practice practitioners. They had enough data to prepare the report and provided all the necessary materials on time.

Part 2

Date, Day weekly		**Planned kind of work or task**	time implementation	**Type of work, Task execution**	Number of the task	Student's mark	manager's mark of the university	manager's mark of the practice base
27.11.17 Monday		Arrival to the practice base, Operating with main documents	09:00– 09:30	Arrived at the base of practice. Have checked out the arrival documents (signature, stamp, date)	1	Task is done	Task is done	Task is done
		Get initial instructions; Place signatures at the journal of the safety	09:30 – 11:00	It was listened to the instruction on fire, sanitary norms, internal rules of work, workplace safety	2	Task is done	Task is done	Task is done
		Make an individual work plan for passing the practice	11:15-15:00	Communication with the manager of practice, the task of passing the practice, collecting the report information	3	Under development and coordination	Partial execution	Under development and coordination
		Work with official instructions	15:00-16:00	Has got acquainted with the official instructions which are used on the basis of practice	4	Task is done	Task is done	Task is done
		Getting to know the team, the history of the organization, active projects	16:15-18:00	Meet the team. history, projects of the base of practice, individual work.	5	Task is done	Task is done	Task is done
28.11.17 Tuesday		Arrive at the venue of the presentation at the address	10:00	Arrived at the venue of the presentation. Get clear instructions and tasks	1	Task is done	Task is done	Task is done

At the same time, it is possible to distinguish several promising directions of work

on the improvement of the use of electronic diaries in the organization of practical work HEI. Among them are:

- firstly, an increase in the number of practice bases that would be ready to accept and provide the opportunity to implement practical tasks in accordance with the practice program for students, as well as the possibility of further employment (especially the problem with specialists in the field of theatrical art);

- secondly, since the system of cultural industry at the present stage involves the use of these technologies, the students of creative specialties should have practical experience in designing and maintaining schedules for the preparation and implementation of a creative task (for example, a concert or theatrical production) electronically, the control of strict execution tasks personally and in a group, regular analysis of the ongoing work and reporting (lack of skills required evidence of professional incompetence);

- thirdly, the improvement of the information platform for cooperation with the practice bases, the necessary calendar plans to cover the stages of preparation and implementation of creative projects, which enabled the active involvement of students in the work process within the framework of practical tasks according to their future profession.

A sample of the Google's "E-Diary Practice" table in two parts.

Conclusions. Thus, effective cooperation between the HEI and the enterprises, which, among other things, is carried out with the support of modern information and communication technologies - the bases of practice on organization and qualitative conduct of students' practice, will allow to form professional competences of the future specialist, to raise the steady interest in the profession, the need for systematic renew their knowledge and creatively apply them in practice. Modern technologies give us the opportunity to monitor, maintain, control, analyze the level of independent work, practical tasks, and also simplify the process of evaluating the implementation of practices and make a real dialogue with future employers. The active use of "cloud technologies" during the training prepares a student for the modern requirements of employers, working conditions in a market environment at the international level. The introduction of such an instrument as the "electronic diaries of practice", which is based on cloud technologies, optimizes and improves the organization of practical training of computational specialists in the artistic and socio-cultural spheres.

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METHODOLOGICAL BACKGROUND OF PROFESSIONAL LINGUODIDACTICS IN UKRAINE

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Annotation. *The purpose of the paper is to substantiate the necessity of a professional linguodidactics further development in Ukraine as an innovative independent branch of pedagogical science. The goal is achieved by setting the following tasks: 1) to reveal the prerequisites for such development; 2) to scrutinize the theoretical and methodological foundations of modern professional linguodidactics.*

Key words: *professional linguodidactics, innovative branch, pedagogical knowledge, professional linguistic personality.*

The significance of the current study is determined by the demand for professional linguodidactics by all modern development of economics, education, and science in the conditions of globalization. Communicative competence in a foreign language for a professional career, for international academic purposes, is no longer the case for a person's success, but a criterion for influencing the economic development of the state, the welfare of society as a whole.

In Ukraine, nowadays, there is a tendency to create a bilingual educational environment, where knowledge of English (as the lingua franca) + mother tongue is considered as the norm. This will give an individual the opportunity for self-fulfillment in a multi-national and multicultural space, which should be provided by a modern system of foreign language training. Therefore, new approaches to foreign language training, especially for professional purposes, are in need, and it is professional linguodidactics as an innovative branch of pedagogical knowledge that provides the mentioned approaches.

The foundations of professional linguodidactics were developed by the following foreign researchers: O. Akhmanova, N. Galskova, M. Druzhinina, A. Zimnaya, A. Krupchenko, A. Kuznetsov, S. Ter-Minasova, I. Khaleeva, I.Tsaturova, etc. In particular, the scientific and theoretical substantiation of professional linguodidactics that put it in rank with didactics, methods of foreign languages teaching and linguodidactics was given in the doctoral dissertation, monographs and numerous scientific publications of A. Krupchenko.

The issues of professional foreign language communication became a part of a range of scientific interests of some Ukrainian researchers (Yu. Avsyukevich, R. Grishkova, N. Drah, P. Lychko, N. Mikitenko, I. Sekret, V.Ponomarenko, O.Tarnopolskiy, etc.). However, there is a lack of comprehensive, systemic researches, innovative models of modern professionally oriented foreign language training that combine them all into a single format.

At the current stage of pedagogical science development, the process of its differentiation is a common case and results in the emergence of new independent branches. This is explained by the scientific and practical necessity for the change of knowledge structure, skills and abilities in accordance with the globalized world requirements. A solution to the theoretical and methodological problems of a future specialists' training in accordance with the new social order of the society and systematization of the didactic process of professional competence forming by means of a foreign language will be facilitated by a relatively new branch of pedagogical knowledge - professional linguodidactics. According to A. Krupchenko (2007), professional linguodidactics is a new branch of linguodidactics that develops a methodology (research, management, and modeling) of professionally oriented foreign language teaching aimed at forming a foreign language professional communication competence, the components of which shape the language personality of a specialist [1].

Unfortunately, this innovative branch of pedagogical science has not yet received sufficient advancement in Ukraine; it has not crystallized into a separate scientific school. Usually, numerous scientific works, dissertation researches on problems of professionally oriented foreign language training of future specialists, especially in non-linguistic higher educational institutions, are conducted in the frameworks of professional or comparative pedagogy.

In this regard, it should be noted that foreign language training (FLT) is a very specific phenomenon, which is not always possible to explain by the terms of general didactics. FLT's idiosyncrasy is determined by the nature of a foreign language, its ability to represent the picture of the surrounding world. Linguodidactics as the theory of language learning deals with the scientific substantiation of FLT problems. It incorporates theoretical outcomes of the related sciences (psychology, linguistics, methodology), taking into account their integrative connections. However, there are new problems that cannot be successfully solved within the frameworks of these sciences. Initially, there is a need not only for introducing a professional component into the FLT process but also for forming a professional foreign language communicative competence of a specialist, the development of professional qualities, professional thinking, behavior in foreign business cultures, etc. It is necessary to gradually bridge the gap between the formation of professional foreign language communicative competence and the formation of professional competence of a future specialist. There is a need for the development of a domestic professional linguodidactics taking into account the specifics of the training of specialists in Ukrainian higher educational institutions, the world trends in the field of FLT in the conditions of harmonization of the system of education and foreign language training with the educational systems of other European countries on the basis of the Bologna Process and Ukraine's accession to the European higher education area.

Thus, the objective prerequisites for the development of professional linguodidactics in Ukraine as an independent branch of pedagogical science are as follows: a high demand of modern globalized society on the level of specialists education, and, consequently, intensive use of professional information from foreign professional sources; an increase

in the number of specialties aligned with foreign-economic activities that require the fluency of foreign languages; the accumulated considerable empirical experience of many higher educational institutions of Ukraine in the field of professionally oriented foreign language training; some significant scientific achievements in the field of foreign language training; a growing need for theoretical and methodological substantiation of the integrated approach to FLT, which has already come out of the framework of the methodology of FLT. On the other hand, low effectiveness of future specialists FLT results from a number of contradictions, in particular:

- between the need for interdisciplinary integration, conditioned by the integrity of professional activity, and the traditional approach to the organization of professionally oriented FLT content just within the framework of a majored subjects, which does not contribute to the formation of a unified system of professional knowledge;

- between the objective necessity for FLT reforming, in particular in non-linguistic higher educational establishments and the state of FL teaching staff professional competence that requires a qualitatively new level of the system of their training in order work in such educational institutions.

These contradictions and the need to overcome them, the high social orientation of the problem, the interest of both the academic circles in the new field of pedagogical science and FL teachers in innovative models of foreign language training, as well as the controversy of certain provisions of professional linguodidactics developed abroad, condition on the development of the domestic professional linguodidactic.

FLT efficiency improvement calls for the systematic training of a number of foreign language teachers for work in non-linguistic higher education institutions. Unfortunately, the issue of the theoretical training of educators-philologists to teaching a professionally oriented foreign language in higher education establishments remains underestimated. Hence, there is an urgent need both to introduce the course of " professional linguodidactics" to the curricula of linguistic universities, foreign language faculties, and to develop an interdisciplinary program of such a course, the content of which will be based on the modern achievements of psychology, professional pedagogy, linguistics, methodology of FLT. This will increase the level of theoretical and practical training of students for professional activities, and facilitate their professional development as future specialists in the system of higher education.

Therefore, for one thing, it is necessary to work out modern theoretical and methodological foundations of professional linguodidactics as an independent branch of pedagogical science, and for the other thing, to design the curriculum of the "Professional Linguodidactics" course. We have emphased on the need to develop the foundations of a domestic professional linguodidactics since we proposed to change the strategic goals of foreign language training (Khomenko, 2015). We proceed from conceptual provision that the development of professional linguodidactics as a branch of pedagogical science and its prospects as a discipline in the system of higher education will be possible owing to the transition from traditional understanding of FLT's goal as developing of four essential language skills to the modern interpretation of its strategic goal as the formation

of multicultural professional linguistic personality, ready for professional intercultural communication and self-development in the conditions of globalized information society. Likewise, the intermediate goal is seen as the formation of the foundations for the secondary linguistic professional personality who speaks a foreign language at a level sufficient for the implementation of intercultural communication in the professional sphere; perceives and respects another culture with its specifics; behaves and acts within another culture in the same way as the native speakers do [2].

Interpretation of the modern specialist as a secondary professional linguistic personality makes it possible to correlate two language systems (native and alien) in consciousness with certain professional spheres and situations of communicative interaction of a learner, a trainer, and a specialist. Obviously, this already overlaps psychology. Therefore, 1) the provisions of psychological science that reveal the psychological preconditions for the development of a secondary professional linguistic personality (SLP), 2) the conditions under which psychological structures of an SLP are most effectively formed and developed, and 3) the provisions aimed at both raising the motivation level of the future specialist, and the need to correlate the individual, age, educational, status characteristics with the level of a foreign language proficiency relate to the methodological basis of professional linguodidactics (O. Golovanova, N. Yurchak, I. Zimnaya, O. Leontiev, A.Plekhov).

The theory of linguistic personality and secondary linguistic personality is considered as the methodological benchmark for the development of the notion of multicultural professional linguistic personality in the professional linguodidactic (Yu. Karaulov, I. Khaleieva, A. Plehov, K.N. Khitrik, O.I. Golovanova, ND Galskova, etc.). The development of the features of the secondary professional linguistic personality provides the scope for communicative and intercultural communication, the ability to successfully live and act in a multicultural world. Therefore, the theoretical studies in the field of intercultural communication acquire an extraordinary weight for the professional linguodidactic (N.Borisko, N. Bykhovets, N. Galskova, O. Morozov, S. Nikolaeva, E. Passov, V. Safonova, M. Berns, D. Collnick, H. Fisher, G. Gay, D. Graddol, N. Grawhall, F. Grin, M. Hager, E.T. Hall, MR Hall, C. Inglis, J. Knight, M.W Lustig and J. Coester, D.C McClelland, R. Phillipson, S. Rathie, G. Redding and B. Stening, B. Rey, R. Robertson, A. Soderberg and N. Holden, M. Bennett, J. Brown, H. Byram, M. Castells, V. Castells, M. Cogburn, D.L. Higgs, T.H. Spencer-Oatey).

We considered intercultural professional communication as a dialogue of industrial cultures that is predetermined by globalization with its transnational network of relations, migration processes, financial, information flows, etc. Hence, the dialogic concepts, in particular, the M. Bakhtin's and V. Bibler's (1991) fundamental ideas of the dialogue of cultures is an inalienable methodological component of the foreign language training of future specialists, and, consequently, the methodological basis of the professional linguodidactics.

Dialogue as the ability to communicate in the field of human relations is formed on the basis of humanism. Humanistic ideas and guidelines are aimed at the personality of

a future specialist, at such qualities as individuality, education, autonomy, extraordinary, creativity. Consequently, humanism, humanistic concepts are the next methodological component of professional linguodidactics.

Education is defined as an organized mastering of cultural experience via information exchange (V. Lugovyi, 1999). A foreign language as any language system is a socio-historical product that reflects the cultural experience of the people, at the same time being the transmitter of information on the social and cultural experience gained by different generations, serving as a bridge in the dialogue of cultures. This interpretation correlates with the current definition of education, and, thereafter, foreign language training as a purposeful lifelong informing of a person. Alongside with formation of a foreign language professional competence the task of a professional linguistic personality also lies in mastering the socio-cultural experience of a foreign linguocultural community.

Obviously, mutual understanding is achieved not only by the linguistic means, particularly, in the professional field. Hence, V. Lugovyi's cultural and informational theory of education is a cornerstone in the methodological basis of professional linguistics.

It stands to reason that domestic professional linguodidactics should be developed within the context of harmonization European higher education area, taking into account the general tendencies of the European language policy. As a segment of education, foreign language training should be in line with the basic conceptual positions and trends of vocational education and modify them according to their specificity. Professionally oriented foreign language training also rests upon the European researches on such issues as: reforming of higher professional education in the context of the Bologna Process (B. Mair, M. Paecher, R. Sternberg); Content and Language Integrated Learning (D.Marsh,1994), competence approach to foreign language professional education (P. Wordelmann); the relationship of professional competence with the social characteristics of a specialist, in particular, with professional culture, professional identity, desire for the lifelong self-education (M. Woodcock, D. Francis); professional socialization (W Lempert, P.Windold, etc.); peculiarities of modern professionally oriented training organization (G. Egloff, A. Fitzpatrick, L, Graf, A. Schneeberger, K. Stenberg, etc.); designing of professionally oriented foreign language training models (G. Egloff, A. Fitzpatrick, J. J. Powell, N. Bernhard & L. Graf, et al.).

The founders of the fundamental direction in the professionally oriented FLT "English for Specific Purposes" (ESP) T. Hutchinson and A. Waters introduced the concept of professionally oriented foreign language training this is essentially both language and context learning-oriented approach. The same concept was investigated by P C. Robinson, D. Douglas, T. Dudley-Evans, M. Jo. St. John and others. All mentioned above studies, original concepts, and methodologies also refer to the methodological base of the professional linguodidactics.

It should be noted that the modern conceptual model of foreign language training in Europe is realized in the context of the main methodological documents of the Council of Europe: European levels of foreign language proficiency declared in The Common

European Framework of Reference for Languages; The European Language Portfolio. It is the provisions of these documents that are supporting and for domestic professional linguodidactics.

Conclusions. The necessity of forming a professional linguistic personality as a social order of modern society requires new approaches to professionally oriented foreign language training of future specialists on the basis of fundamentally new formats, namely, in the format of professional linguodidactics as an interdisciplinary scientific field of knowledge.

The scientific novelty of the research is to prove the feasibility of developing the professional linguodidactics as an independent branch of pedagogical science in Ukraine

We see the theoretical value of the work in an attempt to determine the theoretical and methodological foundation of domestic professional linguodidactics.

The practical value of the study lies in the fact that the ideas presented in it can be used in the practice of foreign language training in a professional higher school, in methodological seminars for teachers, and be further developed in researches of scientists.

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APPLYING DYNAMIC GEOMETRY SOFTWARE IN THE STUDYING PROCESS IN HIGH SCHOOL

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Annotation. *This article analyzes opportunities and peculiarities of employing dynamic geometry software and computer-oriented methodic systems for visualization of geometric and, more broadly, mathematical studying material in the process of educating future specialists. It researches methodic techniques for optimal combination of classic methods of problem solving with applying dynamic geometry tools and other IT technologies in studying process of high school.*

Proceeding from these arguments the authors deem appropriate inclusion of basic skills of working with dynamic geometry software into the list of main professional competences of future mathematic teachers.

Key words: *dynamic geometry, dynamic geometry software, information technologies, programme environment, geometrical problem, spatial imagination, spatial thinking, model, studying process.*

Introduction. As scientific and technical progress accelerates intensively and provokes drastic profound transformations in social economic and cultural realms, society is in urgent need of initiative competitive specialists capable to streamline modernization process and find solutions of unconventional professional and personal tasks by generating new ideas and technologies.

High school professors should necessarily take account of sharp social transformation, up-to-date scientific and technical progress, substantial changes into requirements to professional education of students with due adaptability and ability to act initiatively and creatively in professional activity and everyday life.

Applying modern IT technologies in education is characterized by great potential and diversity of dimensions. One of the most imminent challenges that high school professor faces under current circumstances consists in constructing appropriate conditions for upbuilding innovative techniques of students' studying activity, involving students into prospective scientific work both at in-class and out-of-class activities, while complying with individual tasks, preparing reports and analytical papers, passing final tests and writing bachelor and master dissertations in accordance with acting curricula [Shapovalova N. V., Panchenko L. L., 2017: 347]. Today this challenge cannot be resolved without applying new information computer technologies employed in relevant methodical and programme environment adapted for each particular discipline.

Modern software allow to raise visuality of the studying process at a qualitatively new level. Forms constructed with their help can be easily rendered dynamic in order

to trace and analyze how figures are transformed when their starting parameters change [Artemchuk O. R., Moroz M. P., 2017:13].

Analysis of main research works and publications. Issues of creating and employing information and multimedia technologies in studying process were investigated in works of M. I. Zhaldak [Zhaldak M. I., Goroshko Y. V., Vinnychenko E. F., Tsybko G. Y., 2016],[Zhaldak M. I., Hrokhol's'ka A. V., Zhyl'tso O. B., 2004], [Zhaldak M. I., 2003], [Zhaldak M. I., Vityuk O. V., 2000], Yu. S. Ramsky, S. A. Rakov, O. P. Zelenyak, O. V. Semenikhina [Semenikhina O. V., 2015], [Semenikhina O. V., Drushlyak M. H., 2016], V. M. Rakuta and others. These scholars laid conceptual ground and paved the way to implementing new computer technologies in studying mathematics, inter alia, of dynamic geometry software as potent means of visualizing geometric facts.

The purpose of this article consists in revealing and investigating specifics of employing special software and computer-oriented methodical systems to resolve geometric problems in high school studying process and in putting forward methodical techniques for optimal combination of classic methods of solving geometric problems with use of dynamic geometry software and of other information technologies in education.

The research methods we resort in our work encompass theoretic, empirical and comparative methods, inter alia: generalization and typologization of the existing dynamic geometry software, analysis of studying material in geometry course with respect to ways of employing dynamic geometry software, comparison of different dynamic geometry programmes and evaluating the expediency of their introduction into middle and high school studying processes, collecting and analyzing up-to-date experience of recognized experts in this realm and prospective method for outlining ways of further improving studying system and raising its efficiency.

Main results of research. Development of students' information skills is of high importance for facilitating scientific progress and other key social, economic and political processes and for thorough adaptation of domestic educational system to European norms and standards.

Dynamic geometry software or interactive geometric systems based upon them are recognized all over the world as the most efficient means of improving mathematic education through information and computer technologies. The most widely spread became such programmes as Cabri (France), The Geometer's Sketchpad (USA) and GRAN (Ukraine).

The course of geometry as one of fundamental elements of professional education opens broad opportunities for students' intellectual self-development through formation and development of logical thinking, space imagination, algorithmic culture, ability to determine causal links, construct mathematic models of various processes and phenomena, build argumentative lines to uphold own conclusions etc. Creating high-quality software for solving problems present into geometry course of high school which includes analytic geometry, projective geometry and image methods, differential geometry and foundations of geometry is a priority task for moving forward Ukraine's integration into European

education space [Shapovalova N. V., Panchenko L. L., 2016: 168].

Imminence of this task is stipulated not only by considerations of improving learning and cognitive progress in basic disciplines for which well-developed space imagination is indispensable but also by its utmost importance for mastering knowledge in various fields and applying them to cope with both theoretical and practical tasks. Computer programmes enable to construct and explore models of new objects and phenomena; thus employing new computer technologies for their investigation contributes not only to superficial understanding of learning material but also to its more thorough comprehension by students [Zhaldak M. I., Vityuk O. V., 2000]. It renders their studying activity more sensible and productive.

For adequate perception of our surrounding three-dimensional space, of various forms and sizes of objects existing in it and of their arrangement students need certain amount of space imagination and knowledge that underpin geometric way of thinking while solving problems and proving theorems. It determines the necessity in development of space imagination and thinking [Shapovalova N. V., Panchenko L. L., 2016: 167].

Human brain is capable to construct imaginatively objects that do not exist in reality, the so called abstract objects. Instances of them include mathematic objects: symbols, figures, functions, equations, inequalities, models of buildings, cities, cars, airplanes, vessels. While solving various practical problems we have to construct and analyze different models of real phenomena and objects.

Constructing computer model and conducting calculating experiment require resorting to modern information and communication technologies. This is a vivid example of employing both material (personal computer) and ideal (applied software, special pedagogical tools , Mathematica, Derive) instruments. The most optimally adjusted to training future mathematics teachers are special pedagogical software GRAN prepared by research group headed by M.I. Zhaldak. Methodic features of utilizing these software are amply exposed in sources [Zhaldak M. I., Goroshko Y. V., Vinnychenko E. F., Tsybko G. Y., 2016], [Zhaldak M. I., Hrokhol's'ka A. V., Zhyl'tso O. B., 2004], [Zhaldak M. I., Vityuk O. V. 2000].

Pedagogical software GRAN-2D belongs to dynamic geometry tools and is designed to facilitate analyzing systems of plane geometrical object. Pedagogical software GRAN-3D enables students to handle models of spatial objects under consideration in the course of stereometry and also provides them with instruments of analysis and calculating quantitative characteristics of diverse objects in three-dimensional space. Software GRAN-2D can be attributes both to problem-solving programmes and to modeling programmes [Zhaldak M. I., Vityuk O. V., 2000].

The above mentioned software allow to model figures that emerge in problem specification, conduct graphic constructions, verify a hypothesis, select an optimal method of problem-solving. They also may be used for tracing certain process dynamics with geometric models as instances thereof [Shapovalova N. V., Panchenko L. L., 2017: 91].

Unlike traditional geometric drawing performed on a sheet of paper or through ‘usual’ computer graphic systems, project created in dynamic geometry environment represents

a model that preserves not only the output of construction but also its input parameters, algorithm of construction and mathematical interrelationships between the objects. All these parameters can be easily altered (moved and relocated, changed in length and width, assigned alternative quantitative amounts etc.). The output of those alterations is immediately visible on the screen. Moreover, a range of construction instruments becomes essentially broader (including, for instance, geometric transformations), opportunities for figure design (size and colour of figures) grow and animation becomes possible. Besides, dynamic geometry creates an environment where figures can be rotated, positioned in specific way tailored to concrete problem and compared with other figures demonstrated alongside. These are main learning advantages of dynamic geometry programmes.

Of significant methodicimportance is the fact that dynamic geometry software may be used both for in-class and distance and homework, in different types of in-class training and with various levels of computer equipment. They make learning process in geometry and in mathematics in general easier, increase memorability of studying material, expand opportunities for using activity approach while teaching geometry due to introduction of experiment elements into studying process, increase extent of students' emotional engagement, provide for formulating more creative tasks and organization of students' teamwork and research projects, demonstrate efficiency of modern technologies in modeling and visualizing mathematic notions and allow students to gain basic skills in handling them.

Teachers and tutors may employ such software for establishing individual concrete models and problems, providing more detailed material explanation, formulating step-by-step construction plans and proposing particular forms of tests and evaluation of students' knowledge. Students are not necessarily required to work with software, they may work with pre-constructed models and forms.

In dynamic geometry software users can create semi-functional and autonomous programmes for handling particular models. Such programmes, in their turn, can be used as instrumental environments for organizing students' individual work both in-class and at home. In those environments' students should be required to solve problems on constructing and investigating particular objects allowing to attain certain learning effects.

Employing software in such manner corresponds to most up-to-date pedagogical approaches but entails certain restructuring of studying process with preparation of new textbooks accentuating project-oriented and research-oriented activity of students and raising teachers' qualification.

Dynamic models, forms of their employment in studying process and types of tasks associated with them may be classified as following:

1. Static drawings-illustrations.
2. Manipulative research models.

2.1. To discover a geometric figure or its properties.

2.2. To conduct quantitative experiment.

2.3. To disclose mechanism of transformations.

2.4. To select a right angle for a figure.
2.5. To determine limiting values.
2.6. To investigate a geometrical locus of points.
3. Constructive tasks.
3.1. To make a construction by means of electronic compasses and ruler.
3.2. To make a construction using limited range of instruments.
3.3To make a construction with limited access to objects.
3.4. To solve a positional problem.
3.5. To make a stereometric construction.
4. Tasks requiring check of construction or answer.
4.1. Check of construction.
4.2. Check of filled symbolic/textual row.
5. Scenario representations and trainers.
5.1. To make use of visual tips.
5.2. To trace stages of construction.

Let's take up the first type of dynamic models and assess the expediency of their usage in the studying process. The need to accompany geometric problem with a drawing is the simplest but at the same time the most widespread tasks students face in their practice. Geometric drawing in pre-computer understanding represents a hand-made arbitrary drawing on paper or on board by means of compasses and ruler. Such drawing rarely is accurate and is hard to correct without remaking anew.

Drawings in raster computer graphic redactors (for example, the simplest of them Paint) are easier to create accurately but difficult to correct. Drawing in vector graphic redactors (for instance, drawing instruments in MS Word or special packets like Corel Draw, Adobe Illustrator) produce more high-quality output with all objects undergoing alterations rather easily. However, vector graphic redactors do not possess one of the most important feature of dynamic geometry programmes – connectivity of objects that is defined by geometric characteristics of construction.

Construction drawing on the screen should automatically alter all its elements when one of them is altered: perpendicular on a straight line, bisector or inscribed circle should remain perpendicular, bisector and inscribed circle. Thus elements of a drawing can be easily transformed when necessary as components of a dynamically interrelated system with preservation of mutual correlations. This is the reason why employing sophisticated software is so important for creating high-quality drawings which may prompt student to fast finding the right solution of a problem.

Manipulative models allow to move the drawing including all its interlinked elements belonging to a single geometric figure or to a continuous group of geometric figures presented as a whole. During such manipulations certain elements, properties or regularitiesremains intact, invariant. Acquiring a skill to reveal them has a great motivational effect upon students, improves their creative capabilities, space imagination and thinking, develops ability to formulate and comprehend geometric regularities, substantially increases the level of emotional drive due to involvement into disclosure of

a new fact and makes learning material more memorable for students.

In a stereometric problem sometimes it suffices to look upon a spatial drawing from the right angle – and principle of solution becomes understandable.

Manipulative models can also indicate existence and quantity of particular problem solutions depending on input parameters or posed specification.

The most important set of learning task in the course of constructive geometry relates to construction problems requiring the use by students of existing virtual instruments. Any "classic" school problem by means of compasses and ruler may be presented in interactive computer form. And both for the final drawing and for intermediate stages of problem solution of great significance is the possibility to verify accuracy of construction with varying input parameters – when it seems that the drawing should be correct but in practice it becomes distorted or disappears at all after deformation of output objects because it was only visually looking like the correct drawing and not geometrically accurate construction. An essential addition to the construction may be also possible experimental exploring of limits of problem solutions.

Article [Semenikhina O. V., 2015] set forth a range of arguments in favour of employing dynamic mathematics software in studying process. In particular, these software seriously lessen amount of time spent on preparing high-quality geometric drawing for problem solution; owing to dynamic nature of the constructions one can quickly and easily detect a mistake in solution: even a minor rotation of figure points in an incorrect drawing would disrupt visually "accurate" configuration; these programmes facilitate organization of empirical search of regularities and interlinks between elements of various geometric configurations [Artemchuk O. R., Moroz M. P., 2017:11-12].

Employing dynamic geometry problems enables preliminary restriction of tools that should be used for resolving a construction problem while formulating its specification. Interestingly, upon altering the set of those tools teacher may turn one problem into several problems of different geometric substance.

Among construction problems there are problems with so called 'inaccessible' elements that should be reconstructed proceeding from the previously acquired knowledge about geometric figures and geometric transformations.

Construction problems in computer form may have a function of automatic check of answer and not only determine final mark but also accompany incorrect or incomplete solutions with due commentaries.

In such programmes it is possible to check the correctness not only of the geometric construction itself but also of a given quantitative answer, textual row or other forms of solutions.

Broad methodical opportunities are provided by dynamic geometry for step-by-step scenario work with multi-level tasks. Of particular value are, for instance, dynamic drawings with visual prompts. In these drawings pieces of information performing the role of prompts initially is hidden. Prompts may be accessed both directly (through clicking upon hyperlink) and requiring some prior actions by student. Prompt may emerge as an additional construction, meaning of a certain value, animated transformation of a

figure etc. It is important that prompts remain non-verbal thus promoting development of geometric imagination, intuition, ability to perceive information in various forms.

Dynamic geometry instruments may be applied for drafting step-by-step demonstrations or presentations of problem solution. Presentation is a compilation of slides providing, basically, brief text describing the process of proving, construction or calculation containing hyperlinks steering the demonstration. Working with presentation a user may (or even should) conduct some actions on the slides. Such presentations substitute parts of textbook and are especially useful for independent work.

Conclusions. In the last years we observe a drastic transformation of the role of software in studying process with expanding their functions and realms of application. If until recently such instruments including dynamic geometry software have been used mainly by teacher for illustrating leaning material in more visual and comprehensible mode, today they are increasing employed for organization of solving practical problems by students and for controlling their learning progress. Thus, growing popularity gain special electronic supplements to existing handbooks or fully electronic handbooks where examples of solving geometric problems are given and tasks for solving are formulated in specific programme environment. For instance, Ukrainian publishing house "Ranok" has been developing for several years an interactive learning platform http://interactive.ranok.com.ua/course with packages of accompanying audiovisual and control materials for each textbook.

With cloud technologies spreading in society, new opportunities for organizing electronic environment of interaction between tutors and students emerged allowing for autonomous control of learning progress employing dynamic geometry software. Leading Ukrainian universities actively introduce learning platform Moodle[Franchuk V. M., 2017:88] through which students do not perform only as passive recipients of visual material any more but are intensively engaged into its production and accomplishment. It is of particular value for programmes of distance education, distance and video-courses that are gaining increasing demand among young people. It means that basic skills of working with dynamic geometry software should be included into the list of main professional competences of future mathematic teachers and should be incorporated into corresponding professional standards.

Although mathematic models always contains incomplete characteristics of objects under investigation that prevents them from achieving absolute accuracy and correlation with real process, it does not diminish their academic value as important instruments of analysis, observation, comparison and forecasting various phenomena in different spheres of life. Computer programmes from among dynamic geometry tools enable to research dynamics of process and phenomena taking geometric models as examples thereof.

Organic combination and interrelation of mathematic, computer modeling with dynamic geometry tools in learning mathematics is an indispensable element of studying process and research activity. Employing multimedia technologies and visualization of the learned data makes it possible to re-imbue "exact" sciences with demonstrativeness

often eclipsed by abstract and complex nature of their categorial and formula apparatus. Employing dynamic geometry software allows to raise visual component of studying process at a qualitatively new level and to conduct construction of complex dynamic geometrical figures. Drawings created with dynamic geometry tools can be easily transformed in order to trace how they are changed in case of altering input parameters.

Acquiring by middle and high school students of skills to design models for further application in studying and production process, to elaborate methodic techniques for conducting studies with employing computer modeling, to project new models and improve existing ones in their research activity is an essential condition for adequate educational level of future specialists.

As times goes by, a pressing need emerges to introduce more complex desegmented synergetic models of reality built upon combination and synchronization of social process in the course of scientific progress. Complicating of research objects themselves induces academy to elaborate and improve mathematic models used for their analysis. Such developments pose before the academic community a challenge of finding optimal ways of using dynamic geometry software at all stages of studying process.

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MEDICINE AND PHISIOLOGY

FEATURES OF THE REGULATORY SUPPORT OF THE CARDIOPULMONARY SYSTEM OF PATIENTS WITH PERSISTENT BRONCHIAL ASTHMA AND OBESITY

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Annotation. *The worldwide pandemic of obesity and its association with bronchial asthma (BA) is creating severe challenges for health care specialists. So, the investigation of mechanisms behind poor BA control in obese subjects is of great urgency.*

Blood pressure (BP) data and cardiointervalometry indicated deterioration of the cardiovascular function in the patients under study. Under the persistent course of BA there is a deterioration in the effectiveness of reduction of myocardium, regardless of body weight, deterioration of the processes of myocardial repolarization with its increase, and prevalence of parasympathetic effects on the heart rhythm. The general activity of free breathing is the lowest.

Key words: *obesity, uncontrolled bronchial asthma, persistent bronchial asthma, central hemodynamics, heart rhythm, respiration pattern.*

Introduction. Obesity is one of the main problems of health care around the world. It significantly increases the risk of various pathologies development, including type 2 diabetes, hypertension, chronic kidney disease, cardiovascular diseases, some types of cancer, depression, etc. Numerous epidemiological researches prove that there is a global epidemic of asthma and obesity that is concentrated in Westernized and developed countries [1, 2, 3] and increases in a parallel pace. In many cases it is an economic burden that prompts for effective counteraction search. It has been shown that the presence of obesity increases the risk of BA development, and BA is more common in people with obesity than in those of normal weight. Additionally, obesity can cause or even aggravate the course of asthma, which is reflected in the severe control of these patients [4-7].

Another problem is combination of metabolic syndrome and asthma that has grown rapidly over the past decades. Asthma is characterized by reversible episodic obstruction of the respiratory tract with hyperreactivity, whereas the metabolic syndrome is characterized by obesity, insulin resistance, dyslipidemia, hypertension, and intolerance to glucose. Studies made indicate that metabolic syndrome in association with impaired lung function may be a factor of BA formation. Among the components of the metabolic syndrome which are associated with asthma's risk, obesity is most palatable [8]. On the other hand, syndromes associated with an increase in blood pressure and blood glucose levels are considered as asthma' s important risk factors, while the comprehension of their relationship is not entirely convincing. Thus, in some researches it has been shown

that insulin resistance is a more significant factor in asthma symptoms occurring than weight gain or waist circumference, while according to others the risk of asthma is due to predominantly increased body weight in women. Therefore, it is unclear whether metabolic changes in obesity are independent risk factors for asthma development [9-12].

Although, according to some authors, some obese patients suffering from allergic asthma have a more severe inflammation in the bronchial tree than those with normal body mass. Besides, a significant phenotype of "obesity-asthma" is also found when the degree of severity does not depend on cell inflammation [11-13].

Therefore, the study of regulatory features, including those of cardiopulmonary system in BA with and without obesity is sufficiently important from the point of view of the definition of more subtle mechanisms of regulatory disorders [14].

The objective. To determine the peculiarities of cardiopulmonary system regulation in patients with persistent BA course and obesity.

Materials and methods. There were 69 patients aged 41.0±0.8 under study. They were divided into 4 groups. The main group (MG) included 20 persons (8 men and 12 women) who had clinically confirmed persistent asthma and obesity (BMI greater than 30 kg / m2). Taking into account BMI, comparative groups (CG1 and CG2) were formed, the first of which included 15 persons with BA persistent course and BMI 25.1 – 29.9 kg / m2, the second group included 24 patients with BA the same course and BMI up to 25.0 kg / m2. To determine the regulatory differences in view of BA severity, a control group (CG, n=10) was formed, in which BA intermittent course was observed together with obesity.

All the patients signed informed consent.

The patients were screened in the early hours, in fasting state. When put to the test, recording of cardio respiratory system performance using spiroarthriocardiorhytmography (SACRG) was applied. This method allows to make simultaneous registration of the regulatory effects activity on the heart rate, systolic and diastolic blood pressure, respiration [15].

Additionally, the clinical parameters of the BA course were analyzed and the physical development indicators were registered. The mass (MT, kg) and the body length (BL, cm), the circumference of the body and the limbs were determined. The routine methods for studying systolic (SBP), diastolic (DBP) and pulse (PBP) arterial pressure were carried out, as well as the calculation of a number of indices that characterize the functional state of the cardiopulmonary system and the body as a whole: Robinson's index (IR), Kerdo's index (KI) [16].

Regulatory influences were determined on the basis of spectral analysis of cardiac rhythm variability (HRV), blood pressure and respiration (ER). Spectral analysis was performed in three frequency bands: ultra-low frequency (VLF, 0-0.04 Hz), low frequency (LF, 0.04-0.15 Hz), and high frequency (HF, 0.15-0.4 Hz), which are measured in absolute values of power (ms2 - for CP, mm Hg2 for CBP and DBP, (l / min)2 - for uncontrolled breathing). The sensitivity of arterial baroreflex (BR) was determined. In this case, we analyzed α-coefficient separately calculated in the ranges of high (BRHF) and low (BRLF) frequencies.

The hemodynamic and minute volume of blood flow (MVBF, l) were determined based on ECG data in 1 withdrawal.

According to the ultrasonic spirometry, the indicators of the respiratory pattern – respiration volume (RV, l), the volume of inhalation and exhalation velocity - RV/ Tiv (l / s) and RV / Tev (l / s), the ratio of inhalation and exhalation phases Tiv/Tev, as well as the minute volume of breath - MRV, l. Parameters of cardiovascular and respiratory system synchronization – Hildebrandt's index (IH) and the ratio MVBF / RMV, which certify the frequency and volume components of synchronization of the cardiorespiratory system [17].

Non-parametric methods of statistical analysis with the definition of Man-Whitney criteria were used to evaluate the obtained results of the study. Statistical processing was carried out using statistical package STATISTICA 10.

We have concentrated our attention mostly on heart rate and breathing regulatory effects and performed an analysis of the differences in the indicators of CG, CG1, CG2 and MG.

The results obtained confirm the morphometric differences in patients with asthma based on BMI and are given in Table 1.

So, all the dimensions investigated in CG1 and GP2 ($p<0.01$), differ significantly from those in the MG, among which less significant were differences in body length and hip circumference ($p<0.05$). The majority of MG and CG indicators did not differ, except for significantly larger ($p <0.05$) chest circumference in MG 116.5 (112.5; 126.0) versus 112.0 (97.0; 117.0). The latter can testify to the more pronounced formation of emphysematous type of thoracic cell in MG. The predominance of the chest circumference in the CG in comparison with GP1 and GP2 may be due to the morphometric features of individuals with different body mass, which is significantly greater in the CG.

Table 1

The morphometric and BMI data of BA patients

Indicators	CG1	CG2	**MG**	CG
Body mass, kg	73,5 (68,7; 77,5)	81,2 (74,0; 84,0)	**92,5 (84,0; 102,0)**##**	94,2 (81,0; 102,0)
Body length, sm	167,5 (164,5; 170,5)	169,0 (165,0; 174,0)	**173,0 (166,0; 180,0)*#**	171,5 (165,0; 179,0)
IMT, kg/m2	24,2 (23,9; 24,9)	27,8 (27,0; 28,2)	**31,2 (30,4; 32,7)**##**	31,4 (30,5; 32,5)
Waist circumference, cm	73,0 (68,5; 76,0)	87,0 (82,0; 91,0)	**97,0 (95,0; 103,0)**##**	99,5 (96,0; 103,0)
Belly circumference, cm	87,5 (81,0; 90,5)	99,0 (94,0; 105,0)	**108,5 (102,5; 117,0)**##**	105,5 (100,0; 112,0)
Hip circumference, cm	46,0 (43,0; 48,0)	58,0 (54,0; 65,0)	**67,0 (62,0; 77,0)**#**	62,5 (58,0; 73,0)
Chest circumference, cm	96,5 (92,0; 98,5)	104,0 (102,0; 112,0)	**116,5 (112,5; 126,0)**##&**	112,0 (97,0; 117,0)

*, #, & - differences between MG & CG1; MG & CG2; MG & CG, correspondingly.

^, ^^, ^^^ - $p<0,05$, $p<0,01$, $p<0,001$, correspondingly.

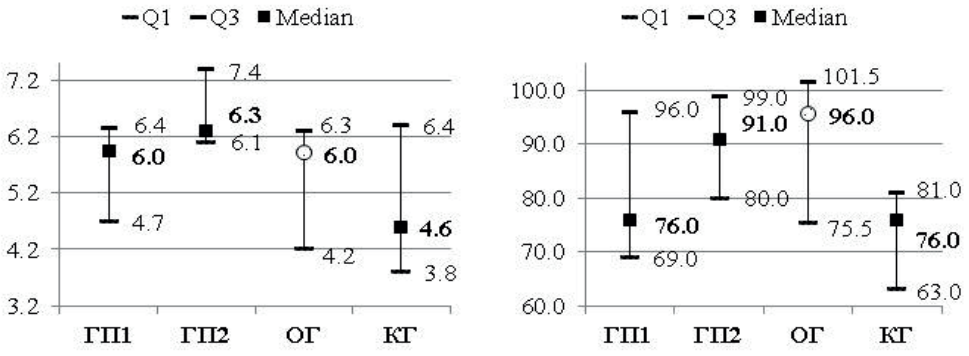
Data of the fatty tissue content determination characterize the significant differences in main and control group of patients from those with normal body mass and overweight. While these patients did not differ on fat content, as well as BMI.

Additionally our patients underwent a number of regulated clinical examinations, clinical and biochemical blood tests, spirography.

The results of clinical blood analysis showed significantly higher ($p<0.05$) Hb's level in the MG patients, than in those from CG. Similar differences are in the values of Hb in other groups with persistent course of BA (CG1 and CG2), which suggests the development of a certain compensation of oxygen transport function, which develops under conditions of chronic hypoxia. However, this requires additional justification.

Biochemical examination of MG patients blood (Fig. 1), showed the increase of blood creatinine ($p<0.05$) in comparison with CG1 and CG2. This may indicate the catabolic processes inclusion, which is significant enough in BA patients with overweight. In the latter there is a sufficiently significant level of urea, which may indicate a development of metabolic dysfunctions associated with a violation of protein metabolism and detoxification.

Respiratory function (RF) in MG patients compared with that from CG is characterized by significant differences which relate both restrictive and obstructive disorders. The differences in inspiration are significant at the level of $p <0.05$, while on expiration they are more significant at the level of $p<0.01$. The data of RF at inspiration prove significant restrictive differences between main and control groups, which are related to lower vital capacity of lungs in MG patients ($p<0.05$). The same differences are typical for the patients of CG1 and CG2. Indicators of RF at expiration in all patients with persistent BA differ significantly from those in CG ($p<0.001$).



a b

Fig. 1. Differences in urea (a) and creatinine (b) blood values in patients with persistent asthma and obesity (MG) compared with CG, CG1 and CG2 patients

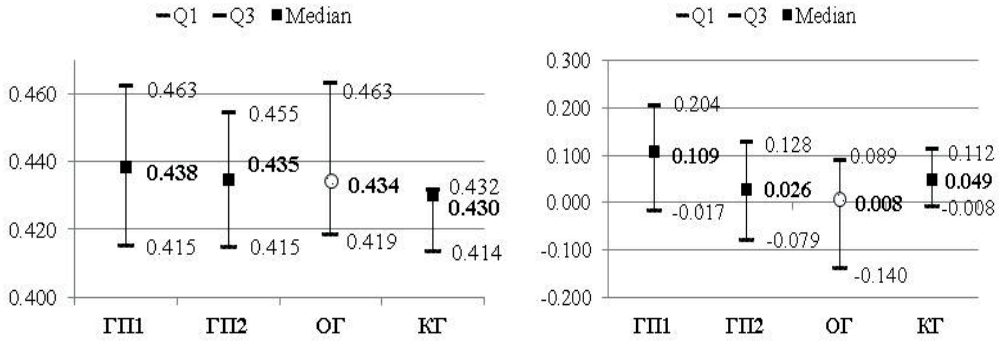
Analysis of blood pressure and cardiointervalometry allowed to note some features

of MG patients indicating deterioration of the cardiovascular system. Systolic BP data were the most intense in patients with excess body weight (CG2) Diastolic BP was the most intense in the MG. Cardiointervalometry data were significantly different in the main and control group ($p < 0.05$). It related the acceleration of atrioventricular conduction (PQ, c) 0.123 (0.112; 0.160) versus 0.152 (0.131; 0.164), delayed depolarization of the ventricles (QR, c) 0.093 (0.029; 0.037) versus 0.029 (0.028; 0.030) and delayed intraventricular conduction (QRS, c) 0.099 (0.089; 0.107) versus 0.086 (0.083; 0.098), which may characterize the desynchronization of the atrial and ventricular activity against the background of chronic hypoxia. Such differences are characteristic for other groups of patients with a persistent flow of asthma (CG1 and CG2). The indexes of heart rate did not differ significantly in all groups.

Changes in QTC (c) and ST (n.o.) indexes in the patients with BA persistent course confirm deterioration of myocardial recovery at the background of increased body weight (Fig. 2).

Indicators of autonomic heart rate (AHR) indicate significantly lower vegetative effect on the TP (ms2) in MG patients compared with CG ones - 1244 (408; 3914) versus 2190 (1444; 2830), $p < 0.05$ in the low-frequency (LF, ms2) and high-frequency (HF, ms2) ranges 453 (135; 1117) versus 742 (480; 1076), $p < 0.05$, and 221 (69; 803) against 988 (303; 1421), $p < 0.05$, respectively. These differences testifies the ones associated with uncontrolled and controlled course of asthma [24].

At the same time, there is little difference between data indicating the regulatory contribution of the sympathetic and parasympathetic regulatory branches (LFn and HFn) in MG, CG2 and CG, both in terms of proportion and ratio.



a b

Fig. 2. Differences between the average indicators QTC, c (a) and ST, b. (b) in patients with persistent asthma and obesity (MG) compared to patients with CG, CG1 and CG2.

The reduction of AHR in patients with persistent course of BA is associated with both the controllability of the pathological process and the patients' body weight. Obesity and even overweight significantly reduce the heart function reserves.

Variables of respiration indexes prove that in persistent course of asthma and obesity,

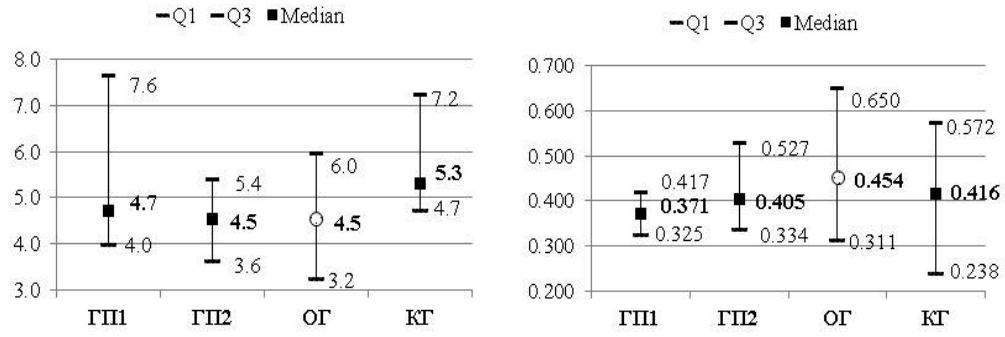
the total activity of regulatory influences on voluntary respiration is the lowest among all the groups under study. Along with it the intermittent course BA patients low activity of over-segmental (VLFbr) respiratory influences, which can characterize obesity and metabolic syndrome.

The data on the sensitivity of the arterial baroreflex in the low-frequency (BRLF) and high-frequency (BRHF) ranges indicate a certain dependence of these indices from BMI in patients with asthma and indicate a significant deterioration of the neuro-reflex mechanisms of central hemodynamics regulation, which can contribute to a significant increase in rigidity of the vessel wall and blood pressure.

The analysis of the respiratory pattern has shown that patients with uncontrolled asthma and obesity undergo a reorganization of the respiratory pattern, which resulted in a significant reduction of RMV due to reduction of RV, compared to a controlled course of the disease that is not compensated by an increase in respiratory rate, against the background of significant reduction of inhalation velocity volume and even more pronounced decrease in volumetric expiratory flow rate. The latter, in our opinion, can be a factor in the impossibility of compensation for hypoxia at the expense of the frequency of respiration, or lead to a more pronounced decrease in RV and tachypnea. So, the results obtained show that in patients with obesity and asthma's persistent course, in contrast to patients in other groups, there are more significant preconditions for the occurrence of dyspnea attacks that may be caused not only by obstructive but also restrictive factors.

The indicators of central hemodynamics in the patients under study prove about their less effective hemodynamic support.

The parameters of cardiopulmonary synchronization are given in Fig.3. They indicate that in patients with controlled asthma and obesity (MG) there is a significant difference in frequency synchronization (FS) from the patients with uncontrolled course, whereas in groups with a persistent course of BA this parameter does not differ significantly (Fig. 3, a). Significant differences are associated with BMI.



a b

Fig. 3. Average values of M (Q1; Q3) of the cardiorspiratory system synchronization in patients with persistent asthma and obesity (MG) compared to patients of CG, CG1 and CG2: FS (a), BMV / RMV (b).

Conclusions. 1. Asthma is an urgent health problem, and it is associated with a high incidence of obesity and poor quality of life.

2. With a combination of bronchial asthma and obesity / overweight there is a violation of pulmonary and cardiac microcirculation, the development of hypoxemia, pulmonary hypertension, the progression of heart failure and the early development of cardiorespiratory complications.

3. In BA patients, impaired hemodynamic and metabolic homeostasis as a result of significant damage to the vessels of lungs microcirculatory bed adversely affects the overall dynamics of the pathological process and is one of the mechanisms for its chronicity and progression.

4. Features of pulmonary ventilation and hemodynamic disorders in asthma take place in the form of prevalence of obstructive ventilation failure, early involvement in the pathological process the respiratory lung area with an increase of alveolar-capillary diffusion ineffectiveness on the background of clear manifestations of central, pulmonary and intracardiac hemodynamic changes .

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THE DIFFERENTIAL DIAGNOSIS OF THE THIRD CLASS OF MALOCCLUSION

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Annotation. *The purpose of this study was to investigate the published evidence regarding the association between the mean values of some cephalometric parameters and their relation to the different types of the clinical formes of mesial bite or third skeletal class of malocclusion. During our investigation we have been improved the efficiency of diagnosis of various clinical forms of me-sial bite by identifying and systematizing of the cephalometric indicators. The study involved 43 pa-tients aged 9 to 32 years (23 females and 20 males) with different clinical forms of the mesial bite (class 3 of malocclusion). In the study used clinical and X-ray methods. Clinical method consisted in examining patients with dentition abnormalities class 3 occlusion anomalies. X-ray method was to study the lateral x-rays of patients and analysis by Bjork, Steiner, Downs, Kim by a computer soft. A comparative analysis of the following parameters: angles ANB, SNA, SNB, ILs / NL, ILi / ML, ILs / Ili, WITS. Based on clinical studies and analysis of X-rays of the patients unable to determine that when clinical forms of third class (progenic mesial bite and progenic neutral occlusion) are ex-pected difference of digital options along with morphological changes that reliably indicates the se-verity of the anomalies based on variants of mutual location of various anatomical struc-tures.Moreover, in the course of the work found that the value of the cephalometric parameters nec-essary for diagnosis when considering teeth anomalies in the sagittal plane are essential to classify the different types of nosology forms of diseases depending on the value of angular parameters.*

Key words: *progenic mesial bite, progenic neutral bite, cephalometric dimensions.*

Introduction. In the diagnosis of dental anomalies, the frequency of mesial occlusion in the structure of dental anomalies is 2-6 % [2, 3, 4].

The causes of this kind of the bite disorder can be varied: hereditary pre-disposition, hypodonty and retention of the teeth in the upper jaw, chronic in-flammation in the upper jaw, trauma, macroglossia, as a determining factor in the pathological development of the lower jaw, premature loss of milk teeth in the upper jaw, early operative interventions on the upper jaw for one- and bilateral palatal clefts, excessive prognathic position of the lower jaw [1, 3, 4].

The development of progenic bite can occur both with impaired growth in the upper and lower jaw, and with a combination of the normal growth of one jaw and atypical growth of the other.

The mesial bite is formed as a result of developmental disorders as the up-per jaw as a whole (upper jaw micrognathia), impaired development of the frontal portion of the upper jaw, retroposition of the upper jaw in relation to the structures of the anterior

cerebral plane, retroposition of the upper jaw at the normal position of the upper and lower jaws in the facial skeleton and as a result of the normal growth of the upper jaw and symmetric hyperplasia of the lower jaw (mandibular bend ia, true progeny, macrognathia of the mandible. Also, the manifestation of mesial occlusion in the oral cavity will be observed with a com-bination of retroposition of the maxilla and prognathic position and the mandi-ble, which will be represented by a pronounced clinical form of progenic mesial bite and neutral bite [2].

In the diagnosis of dental anomalies a cephalometry is an additional meth-od of the investigation has one of the leading roles [1, 5-7].

X-ray method of research, the principle of which is to increase the distance between the tube and the film up to 1.5 m, while placing the cassette with the film close to the head of the subject. The analysis of cephalograms (radiographs of the head), is a x-ray analysis, which allows you to:

1. To determine the direction of growth of the facial skeleton.
2. Differentiate anatomical variants and various clinical forms of dental anomalies.
3. To determine the gnathic and alto alveolar patterns in the formation of a dental-maxillary anomaly.
4. The study of the ratio of soft tissue to the facial skeleton [1, 6-8].

Cephalometric analysis of the head in the lateral projection was performed according to the Steiner, Bjork, Downs, Tweed, Kim method, which included as-sessment of the facial skeleton, teeth and soft facial tissues.

1. Steiner's Analysis : measurements of SNA, SNB, ANB, NSL / Go-Gn Basis angles .The assessment of the location of the apical bases of the upper and lower jaws was carried out by measuring the angles of SNA and SNB.

The SNA angle (mean values of the norm – 82 degrees) indicates the basic position of the upper jaw relative to the anterior skull base. With a decrease in angle to 78 degrees, the upper jaw will be in the retrognathic position, and when enlarged to 85 degrees - in the anterior position relative to the base of the skull.

The SNB angle (mean norm norm – 78 ± 2◦) determines the position of the mandible relative to the anterior skull base. At values of the angle of less than 76 degrees the lower jaw is in the posterior position (the tendency towards the skele-tal class 2), and at a value greater than 80 degrees – in the anterior due to the base of the skull (the tendency to the skeletal class 3).

The angle ANB (the difference between the angles of SNA and SNB, the average norm of the norm - 2 degrees) determines the inconsistency of the size of the apical bases of the upper and lower jaws.

The Go-Gn to NSL angle is located between the bases of the upper and lower jaw, determines the type of their growth and the location of the articular head, is the main indicator in studying the vertical proportions of the tooth-jaw system.

Interincisal angle (ii) – the angle between the lines passing through the cen-tral axis of the upper and lower central incisors is normally 130-135. Reducing the size of the angle occurs in the protrusion, and the increase – with the retru-sion of the front teeth.

Upper incisor to NA (average values of norm – 22) is the angle of inclina-tion of the most advanced before the upper incisor relative to the line NA. With its reduction, there is a retrusion, and with an increase - protrusion of the upper incisors.

Lower incisor to NB (average value of norm – 25) is the angle of inclination of the most advanced before the lower incisor in relation to the line NV. With its reduction there is a retrusion, and increase - protrusion of the lower incisors.

2. In addition to the measurements carried out by Bjork, additional studies were carried out on the following parameters:

N-S-Ba (131) is the angle of inclination of the base of the skull: when the angular values are increased, the retrograde type of profile, with a decrease in the angle-prognate type of profile.

NL / ML (25) – angle of bases (basal angle) by Schwarz: increase of angle –posterior rotation of the lower jaw, vertical direction of growth; angle reduction – anterior rotation of the lower jaw, horizontal direction of growth.

NL / NSL (8.5) – inclination angle of the upper jaw: angular enlargement-posterior rotation of the upper jaw relative to the plane of the anterior skull base; angular reduction anterior upper jaw rotation.

ML / NSL (33) – inclination angle of mandible: angular enlargement-posterior rotation of the mandible, tendency to vertical type of growth; angle re-duction – anterior rotation, a tendency to a horizontal type of growth of the mandible.

Ar-Go-Me (128) – angle of the mandible: increase of angle-vertical type of the growth of the lower jaw; reduction - horizontal direction of growth.

N-Go-Ar (52) and N-Go-Me (72) top and bottom Go: increase the angle of the vertical direction of growth; reduction of the angle-horizontal direction of growth.

S-N-Gn (Y-axis) (59-66) – angle of Y axis: increase of angle-vertical growth pattern, dolichocephalic face type; reduction of angle values-horizontal type of growth, brachycephalous face type.

The sum of angles for Bjork (N-S-Ar + S-Ar-Go + Ar-Go-Me) (394).

3. Additional parameters from Downs analysis:

N-Pg-FH (82-95) is the inner lower corner between the Frankfurt skyline FH and the faceplate NPg. It clearly demonstrates the degree of protrusion or ret-rograde of the mandible relative to the base of the skull.

N-A-Pg (10) – angle of convexity. Determines the degree of retraction or re-traction of the upper jaw relative to the facial plane (N-Pg). The location of the A point ahead of the faceplate is the positive value of the angle, the location of the point A behind the plane is negative.

Ocp-FH (9.3) is the angle of inclination of the occlusal plane relative to the Frankfurt skyline.

4. Additional parameters from Tweed analysis:

The value of the Tweed parameters for our scientific work can hardly be overestimated due to the value of the final position of the lower incisors as the ul-timate factor of occlusion and aesthetics of the face and one of the factors pre-venting recurrence in the

therapy of dental accumulation.

IMPA (90) – the length of the longitudinal axis of the lower incisors (II) to the mandible (MP).

FMPA (24) is the angle between the Frankfurt Horizontal plane (FH) and the mandibular plane (MP).

FMIA (66) is the angle between the lower incisor axis and the Frankfurt plane(FH).

Triangle by Tweed (IMPA + FMPA + FMIA) = 180.

5. Additional parameters from Kim's analysis:

The ODI (Overbite Depth Indicator) (AB to MP + FH to PP) (74.5) is the total value of several important parameters: the angle between the AB line and the lower edge of the mandibular plane on the one hand, and with the addition (subtraction) of the angle values between FH line and PP plane. Plane angle PP: If the plane of the PP is visually higher than the F-H position, then the angle has a negative value (-) and as a consequence, diagnose the tendency to open the bite; if the direction of the plane PP to F-H is down, then the bite problem is bound to the bite depression and the angle has a positive value (+). If the ODI value is less than 65 – diagnose the tendency to open the bite; if the ODI value is more than 77.7, there is a clear tendency toward bite depression.

For our work, it is very important that, if the patient has high ODI values (more than 77.7), this is a manifestation of the greatest tendency for the for-mation of the accumulation of the mandible and the formation of deep bite with subsequent recurrence of the accumulation of teeth.

APDI (Anterior-posterior Dysplasia Indicator) (Facial Angle N-Pg-FH + - AB plane angle AB to N-Pg + -PP anle).

Characteristics of the corner are as follows:

1. The position of the mandible is described by the angle N-Pg-FH (Facial Angle).

2. The angle of the plane AB to the N-Pg with the sign + if the point A has a posterial localization, and accordingly follows with the sign-if point A has aner-ial localization with respect to point B.

3.Cut the plane of the PP to FH with the sign + if the direction is down, the angle of the plane PP to FH with the sign «-» if the direction of the plane of the palate is up.

The mean values of the 81.47 angle characterizes skeletal class 1; more than 85 – tendency to the skeletal class 3; less than 77-tendency to the skeletal class 2. From a prognostic point of view, for the formation of a stable effect after the completion of orthodontic treatment, it is important that if after treatment of patients with grade 2 and the initial APDI 70 after the completion of the active phase of treatment, the rate varies to 80 this and is a prognostic indicator of the stability of the treatment, otherwise, if the APDI parameter is not in accordance with 80, there remains a threatening tendency for relapse of the pathology of class 2 and, accordingly, the accumulation of teeth.

The sum of ODI + APDI-is defined as a Combined Factor (CF). The classi-fication of pathologies of the tooth-skeletal system will also occur depending on the indicators and the combined factor including. The average clinical values of the skeletal class 1 diagnosis are as follows: 74.5 / 81.4 / 155.9 (ODI + APDI + CF). If the CF value is

more than 155, it looks like a high combined factor and can indicate a low angle and a horizontal direction of growth type, and vice ver-sa, if the CF value is less than 150 degrees then the presence of a low combined factor and a high angle and vertical type of growth are recorded.

The calculation of lateral X-ray cephalograms allows determining the pa-thology in the sagittal and vertical planes and will be one of the determining di-agnostic criteria determining the clinical form of malocclusions.

Materials and methods. We examined 43 patients in retaliation from 9 to 32 years (23 females and 20 males) with various clinical forms of the mesial bite. The study used clinical and radiological methods.

The clinical method was to examine patients with dentalalveolar anomalies of class 3 of malocclusion. The X-ray method consisted of examining patient cephalograms and performing a cephalometric analysis by Bjork, Steiner using a computer program. Change in angle values ANB, SNA, SNB, ILs / NL, ILi / ML, ILs / Ili, WITS.

Results. As a result of the work that has done, the following cephalometric characteristics were identified and studied:

ANB angle (ss-n-sm) is the maxillary angle which characterizing the inter-position of the bases of the upper and lower jaws in the sagittal direction. When the maxilla has retro- or micro-gnathia, the value of this angle decreases or be-comes negative values. A negative value is formed in situations where the apical base of the lower jaw is located in front of the apical base of the upper jaw (rate 3).

SNA angle (s-n-ss) – characterizing the location of the anterior apical base of the upper jaw in the sagittal direction (norm 82)

Angle SNB (s-n-sm) – characterizing the location of the anterior apical base of the mandible in the sagittal direction (norm 79).

Angle ILs / NL incisor-maxillary angle resulting from the intersection of the plane of the central incisors and the plane of the base of the upper jaw and char-acterizing the inclination of the incisors of the upper jaw relative to the plane of the upper jaw (norm 110)

The angle ILi / ML of the lower incisor-jaw angle resulting from the inter-section of the incisor plane and the plane of the mandible base and haarterizing the inclination of the mandibular incisors relative to the mandible plane (norm 94).

WITS is measured as the projection distance ss and sm on the occlusal plane. With the front location of the projection of the point A, the distance is considered positive, while the opposite location is negative.

Based on the conducted clinical studies and analysis of lateral cephalo-grams of patients, it was possible to determine that in clinical forms of progenic occlusion, there are expected differences in digital parameters in parallel with morphological changes, which will reliably indicate the severity of anomaly de-pending on the relative positions of different anatomical structures.

Analysis in the sagittal plane:

1. Dento-alveolar relationships. In case of the increased overjet we have a situation with the discrepancy in the sagittal plane as the result of one or more of the following factors

1) increased alveolar prognathy in the upper jaw
2) alveolar retrognathy in the lower jaw
3) protrusion of the upper incisors
4) retrusion of the lower incisors
5) retrusion of the mandibular base compared with the maxillary base.

The first four represent the dento-alveolar discrepancies whereas the fifth must be regarded as a basal discrepancy i.e. a discrepancy in the relation-ship to the two jaw bases, and is described as the sagittal jaw relationship. The extent of alveolar prognathism is measured by the angle pr-n-ss and in the lower jaw by the angle between the chin line and ML. Both measurements represent the position of the alveolar process in relation to the jaw base. The inclination of the upper incisors is indicated by the angle ILS/NL and in the lower jaw by the angle ILi/ML.

The difference between the protrusion of the upper and lower jaws, de-scribed as the sagittal jaw relation, is measured by the angle ss-n-pg With regard to the upper jaw the same point as in the sagittal jaw relationship i.e. ss (Down's A point) is used. The reason is that in practice it is very difficult to differentiate between the jaw base and the apical base, though in the case of growth analysis the anterior nasal spine (sp) is used as a reference point.

In the lower jaw there is a special reference point for the apical base, sm (Down's B point). Another way of describing the sagittal apical base relationship is by the angle ANB.

The apical base relationship can very considerably from the skeletal base depending on variations in the inclination of the mandible and of the prominence of the symphysis.

Incisal sliding is noted if it is observed in the clinical examination. Such "posturing" can result in false values of the sagittal jaw relationship and the api-cal base relationship as the mandibular is translated forward to obtain habitual occlusion (e.g. pseudo class III).

If the measurements of the dento-basal relationship have established that a discrepancy in the sagittal jaw relationship is present, it is of importance to de-termine whether this is caused by the maxilla being protruded in relation to the cranial base while the mandibular position is normal or whether the maxillary position is close to the mean values while the lower jaw is retruded in relation to the cranial base. Both possibilities will result in an increased overjet.

Cranial relationships are described as a position of the two skeletal bases are evaluated in relation to the anterior cranial fossa.

In the sagittal plane the position of the maxillary skeletal base in relation to the cranial base is described by the angle A-N-B.

a) If the maxillary skeletal base is anteriorly displaced – an increase in the angle will exist – probably indicating maxillary prognathism.

b) If the angle is less than the average that is the maxillary skeletal base is more posteriorly placed than normal consequently, maxillary retrognathism is indicated.

The position of the mandibular skeletal base is evaluated in a similar way from the angle s-n-pg. Corresponding to the expression used for the upper jaw the term mandibular prognathism is describing cases with an increased s-n-pg angle. When this angle is less

than the average value the term mandibular retrog-nathism is used.

In cases where both the upper and lower bases are protruded the situation is described as one of total facial prognathism.

In the case of the similar retrusion of the jaw bases is used the term- total facial retrognathism. In cases of total facial prognathism or retrognathism the sagittal jaw relationship can be normal.

Development of the cranial base influences the shape of the face. In the case of a bent cranial base i.e. with a small angle s-n-ba, the maxillary complex, be-cause of its attachment to the cranial base, is placed further forward in relation to the anterior crania base. Bending of the cranial base influences the position of the mandible through the articular fossa situated on the external cranial base in the middle cranial region. In the case of a bent cranial base the mandible is therefore often positioned further forward in relation to the anterior cranial base resulting in a total facial prognathism. Definetly, in the case of individuals with a flattened cranial base, that is, where the n-s-ba angle is greater than average the upper face is retruded, in relation to the anterior cranial fossa, the middle and posterior cra-nial fossae are placed further back and higher up. This influences the position of the mandible because the articular fossa is placed further back and thus the man-dible itself is also further back. The facial skeleton in the case of flattened cranial base is characterized by both upper and lower jaws being positioned further back, i.e. total facial retrognathism.

The clinical cases (seven clinical cases presented)

1 clinical case.

The cephalometric values in the study of lateral TRG in this clinical case indicate that:

ANB -2.9, SNA 79.5, SNB 82.4, ILS / NL 101.9, ILI / ML 90.9, WITS 10.5, ILS / ILI 142.1, A / PG 2.7, indicating: maxillary retrognathia, mandibular prognathia, decompensation retrusion of the frontal teeth close to the normal po-sition of the teeth of the frontal section of the mandible, which in general will de-termine the pathology as a progenic mesial bite.

2 clinical case.

The cephalometric values in the study of lateral TRG in this clinical case:

ANB 3.4, SNA 88.7, SNB 85.3, ILS / NL 105.4, ILI / ML 101.0, WITS -0.4, ILS / ILI 127.5, A / PG 5.7, which indicates a harmonious arrangement of the jaws, retrusion of the frontal region of the maxilla, protrusion of the teeth frontal area of the mandible, which defines the pathology as progenic neutral bite.

3 clinical case.

The values of the ANB-3.6, SNA 87.0, SNB 90.6, ILS / NL 128.7, ILI / ML 93.6, WITS -6.4, ILS / ILI 124.8, A / PG 3.7, maxilla retrognathia, compensatory protrusion of the frontal teeth of the mandible, that in a complex with clinical methods of examination determines pathology as progenic mesial bite.

4 clinical case.

The values of the ANB -3.6, SNA 84.0, SNB 87.6. , ILS / NL 107.6, ILI / ML 68.8, WITS -7.3, ILS / ILI 162.9, A / PG 3.7. The prognathic position of the mandible,

compensatory retrusion of the frontal upper teeth, which, in combina-tion with clinical examination methods, determines pathology as progenetic me-sial bite.

5 clinical case.

The values of the ANB -1.1, SNA 79.5, SNB 80.6, ILS / NL 110.7, ILI / ML 88.7, WITS-3.2, ILS / ILI 139.4, A / PG 5.2, indicating maxillary retrogna-thia, mandibular normal position, compensatory retrusion of the frontal teeth of the maxilla, combined with clinical examination methods, determines pathology as a progenic neutral bite.

6 clinical case.

The values of the ANB 0.3, SNA 82.3, SNB 82.0, ILS / NL 113.4, ILI / ML 93.4, WITS -3.5, ILS / ILI 127.9, A / PG 6.1, indicating the normal position of the upper jaw in the facial skeleton, mandibular prognathia, normal tooth inclina-tion frontal parts of the maxilla and mandible, which in combination with clinical examination methods, defines pathology as progenic mesial bite.

7 clinical case.

The values of the ANB 2.1, SNA 87.3, SNB 85.2, ILS / NL 103.4, ILI / ML 99.9, WITS -2.1, ILS / ILI 136.6, A / PG 2.7, indicating the normal position of the jaws in the facial skeleton, retrusion of the frontal portion of the upper jaw and protrusion of the teeth of the frontal mandible,that, in combination with clin-ical examination methods, defines pathology as a progenic neutral bite.

Conclusions. Thus, in the course of the work done, we found that the val-ues of cephalometric parameters required for diagnosis when examining dentofa-cial anomalies in the sagittal plane (progenic bite) are essential for clarifying the nosological forms of diseases depending on the values of the angular and linear parameters and their mutual combinations.

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MINERAL-VITAMIN COMPLEX «CUPRUM ACTIVE» EFFECT RESEARCH ON RAT'S ORAL CAVITY TISSUES IN METABOLIC SYNDROME MODELING

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Annotation. *The purpose of research - to study the influence of «Cuprum active» complex on the rats oral cavity tissues condition in experimental metabolic syndrome.*

The experiment was carried out for 1.5 months male rats. The intact group received a standard diet. In group 2, metabolic syndrome was modeled by daily administration of pork fat and 10% fructose solution to food. The rats of the 3rd group additionally received «Cuprum active» supplement. The duration of the experiment was 70 days.

Mineral-vitamin complex «Cuprum active» in the simulation of metabolic syndrome restored the level of glucose, uric acid and improved the functioning of the liver of rats. In the periodontal bone tissue, the complex increased the content of glycosaminoglycans and hydroxyproline, showed anti-inflammatory effect and antioxidant properties, and also reduced the number and depth of carious lesions in rats.

Key words: *rats, metabolic syndrome, «Cuprum active» complex, serum, oral mucosa, bone tissue.*

Metabolic syndrome (MS) is a complex of pathological disorders such as abdominal obesity, fasting hyperglycemia, hyperuricemia, dyslipidemia, which are prerequisites for the progression of periodontal disease.

Among patients with metabolic disorders, inflammatory diseases of the periodontal complex are widespread. Obese people are usually hypersensitive to inflammation and, therefore, more susceptible to the development of periodontal disease in the presence of periodontal pathogens. Cytoxins and adipose tissue hormones play a key role in the association of MS and periodontal disease [1].

In the regulation of most biochemical processes occurring in a living organism, significant role is played by microelements. The regulatory functions of microelements can be comparable to the regulatory role of hormones, and the consequence of their chronic deficiency is the risk of hormonal disorders. Microelements lack leads to pathological conditions, mainly due to changes in the synthesis of enzymes in which they are composed [2]. In various pathologies and external dental procedures, such as orthodontic teeth movement and implantology role of microelements especially important

One of the important microelements in the body is cuprum (Cuprum), which biological role is associated with its participation in enzyme proteins synthesis and activation. Cuprum activates cytochrome oxidase, ascorbate oxidase, tyrosinase, phenol

oxidase, etc. [3].

Cuprum is mainly concentrated in the muscles, bones, kidneys, and brain. The average Cuprum content in mammals is 0.001-0.009 % by weight [4]. Also takes part in blood formation – it is necessary for the synthesis of heme, from which hemoglobin is formed, as well as neurotransmitters – substances that transmit nerve signals. Cuprum ions facilitate the transfer of excitation in the brain [5].

It's deficiency increases the propensity to diabetes development, because enzyme insulinase, catalyzing the destruction of insulin, is inactivated [2]. When cuprum metabolism is disturbed, lipid peroxidation increases, which accelerates the aging process. Decreases the activity of the antioxidant ceruloplasmin with a lack of cuprum.

Cuprum plays a significant role in formation of connective tissue - the walls of blood vessels, cartilage, ligaments, which form the basis of musculoskeletal system, skin. Also affects bone mineral metabolism, which plays an important role in the odrodontic movement of teeth.

Purpose of this research was to study «Cuprum Active» effect complex on the tissues of the oral cavity of rats in simulating the metabolic syndrome state.

Materials and methods. In the experiment were taken white rats-males 1.5-2 months of age. The intact group consisted of 6 individuals (I group). Animals of this group received standard food (feed + a mixture of barley and wheat) and had free access to drinking water. In the 2nd (control group), 7 rats were modeled by MS with the help of 2 components: daily oral administration of supplemental pork fat intake at the rate of 40 % of the average weight of the rats in the group; instead of drinking water – 10 % fructose ad libitum. In the 3rd group, 7 rats on the background of the MS simulation received biologically active additive «Cuprum Active» (produced by TOV "Elit-farm", Ukraine) 1 tablet was dispense on 7 rats 5 times a week in the morning. Complex contains of 1 tablet weighing 250 g: Cuprum (in the form of L-aspartin) – 1.5 mg; iron (in the form of iron furmarate) – 1.5 mg; vitamin C – 10.0 mg; folic acid (vitamin B9) – 100.0 mcg. Excipients in the complex: lactose, milk powder, starch, calcium stearate. Before the experiment, the body weight (in g) and abdominal circumference (at the level of the mid-body, in cm) were measured in rats. The duration of the experiment was 70 days. Upon its completion, the rats were anesthetized (sedazin at the rate of 0.1 ml / kg of the rats' mass intraperitoneally), after which they were euthanized by cutting the main vessels. Serum was collected from collected blood samples. Animals after the experiment were weighed, the abdominal circumference, the mass of visceral organs (liver, kidneys, testicles) with abdominal fatty tissue were measured. Pre-separated mucous membrane of the oral cavity, isolated the upper and lower jaws also the liver. The objects of biochemical studies were serum, supernatant of liver homogenates, alveolar bone (50 mg / ml), mucous membrane of the oral cavity (25 mg / ml). The supernatant liqoud was obtained by centrifuging in a PC-6 centrifuge for 15 minutes at 3000 rpm at + 4 ° C.

Rats state of the connective tissue was assessed by the content of hydroxyproline (bound, free and total) [6]; glycosaminoglycans (GAG) [7] in periodontal tissues. In the serum and tissues of rats, biochemical parameters were determined: triglycerides,

total cholesterol (cholesterol), high density lipoprotein cholesterol (HDL), glucose, uric acid, calcium, phosphorus, magnesium, sialic acids; activity of alanine aminotransferase (ALT), aspartate aminotransferase (AsAT), alkaline and acid phosphatases (ALP and CF) using unified methods commercial reagent kits produced by DAC-SpectroMed (Moldova), Felicit (Ukraine), Biolatest (Czech Republic).

The level of lipid peroxidation processes was determined by the content of malonic dialdehyde (MDA) by the thiobarbiturum method [8]. Antioxidant system state was assessed by the activity of glutathione peroxidase (GPO) [9] and catalase [10]. The elastase activity was determined by the method of p-nitrophenol-N-tret-butyl-oxycarbonyl-α-alaninate as substrate use for elastase [11].

The isolated jaws of rats were subjected to morphometric study determine alveolar process bone resorption [12]. On the selected jaws, the number (on average per 1 rat) and the depth (in points) of the tooth decay of the rats were calculated.

Experiments results were processed by statistical methods with the determination of t-criteria for the significance of differences by Student.

Results and discussion. Mineral-vitamin complex «Cuprum Active» influence study was conducted on a model of metabolic syndrome.

During the 70 days of experiment rats were transferred normally. The increment in body weight increased significantly, after the experiment, the circumference of the middle part of the body of the rats also increased (Table 1).

Table 1

The effect of the «Cuprum Active» complex on the rats morphometric parameters (M ± m)

Indicators	Animal groups			
	MC model		MC+ «Cuprum Active»	
	before experiment	after experiment	before experiment	after experiment
The mass of rats (g)	105±7,4	290±31,9	93±9,7	258±20,1 p>0,05
The abdominal circumference of rats (middle part of the body, cm)	13,9±0,4	17,8±1,0	12,5±0,5	17,9±0,3 p>0,05
Mass of visceral organs (g): -liver	-	10,9±0,4	-	12,6±0,8 p>0,05
- kidneys (with fat)	-	10,8±1,3	-	6,9±0,5 p<0,05
- eggs (with fat)	-	10,3±0,8	-	7,9±0,7 p<0,05

Note. p - reliability index difference compared to the group «model of MS».

Under the action of the «Cuprum Active» complex, the mass of visceral organs (kidneys and testicles with fat) was unreliable decreased by 36% and by 23%, respectively. In contrast, liver mass tended to increase by 16% as compared with the «Model of MS» group.

The «Cuprum Active» complex significantly reduced the main indicators of the

blood serum of rats, which characterize the manifestations of experimental MS - the content of triglycerides and total cholesterol. The level of HDL cholesterol in this case increased 1.5 times, not reaching, however, the level of the intact group (Table 2).

Table 2

The effect of the «Cuprum Active» complex on the biochemical parameters of blood serum of rats (M ± m; p; p1)

Indicators	Animal groups		
	intact	model of MS	MC+ «Cuprum Active»
Content: triglycerides (mmol / l)	1,53±0,03	2,22±0,02 p<0,001	1,70±0,02 p<0,001 p_1<0,001
- cholesterol (mmol / l)	5,31±0,09	6,31±0,03 p<0,001	5,80±0,04 p<0,001 p1<0,001
- HDL (mmol / l)	4,04±0,18	1,69±0,05	2,52±0,03 p<0,001 p1<0,001
- glucose (mmol / l)	2,32±0,07	5,20±0,07 p<0,001	2,53±0,10 p1<0,001
- uric acid (μmol / l)	258±4,13	467±6,90 p<0,001	253±2,88 p1<0,001
Activity: -ALT (mmol / l)	1,42±0,16	3,09±0,13 p<0,001	1,38±0,03 p1<0,001
-AsAT (μmol / l)	0,53±0,010	0,81±0,011 p<0,001	0,59±0,03 p1<0,001

Note. The confidence index p is calculated in comparison with the intact group; p1 - with a group of «Model MS».

Under the complex influence, glucose level in the blood serum of rats decreased by 2 times, uric acid - by 1.8 times. The content of these indicators, most important for the characterization of the MC, approached the data of intact groups.

The complex improved the functional state of the rat liver – ALT activity decreased 2.2 times, AST – 1.4 times as compared with the “Model MS” group (Table 2).

A study of periodontal bone resorption revealed a tendency for its decrease by 11 %. At the same time, the number and depth of caries lesions decreased (Table 3).

The obtained data are consistent with the results of the study of mineral metabolism in periodontal bone tissues. Under the action of the complex, the activity of alkaline phosphatase phospholipids, the osteoblast marker enzyme, and the content of calcium and phosphorus significantly increased (Table 4).

The activity of acid phosphatase in the bone of the alveolar process decreased twice (Table 5), which resulted in a decrease in the resorption processes.

In the soft tissues of the periodontium, inflammatory processes were reduced under the influence of the complex, as evidenced by a 1.2-fold decrease in acid phosphatase activity in the oral mucosa (Table 5).

Table 3

Influence of the «Cuprum Active» complex on the condition of the tooth-jaw system of rats (M ± m; p)

Indicators	Animal groups	
	model of MS	MC+ «Cuprum Active»
Bone resorption of the alveolar process (%): lower jaw upper jaw	 36,2±1,3 27,4±1,7	 32,1±1,8 p=0,10 24,2±1,3
The number of carious lesions (average per 1 rat)	2,7±0,2	2,0±0,2 p=0,03
Depth of teeth caries lesions (in points)	3,0±0,3	2,1±0,3 p=0,06

Note: p - an indicator of the reliability of differences compared with the group «Model MS»

Table 4

The influence of the complex «Cuprum Active» on the state of mineral metabolism in the bones of the jaws of rats (M ± m; p)

Animal groups	Activity of AP (nmol / s g)	Content	
		calcium (mmol / g)	phosphorus (mmol / g)
model of MS	330±2,90	0,32±0,0015	1,10±0,080
MC+ «Cuprum Active»	348±7,26 p=0,05	0,35±0,0055 p<0,001	1,66±0,07 p<0,001

Note. p - reliability index difference compared to the group «model of MS».

Table 5

The effect of the «Cuprum Active» complex on the activity of acid phosphatase and elastase in serum and periodontal tissues of rats (M ± m; p)

Indicators	Animal groups	
	model of MS	MC+ «Cuprum Active»
	oral cavity mucos membrane	
Acid Phosphatase activity (nkat / g)	22,3±0,81	18,0±0,49 p=0,004
	alveolar process bone	
	24,4±1,82	12,5±2,30 p=0,004
	blood serum	
Elastase Activity (mkat / l; mkat / kg)	157±9,65	130±6,77 p=0,04
	alveolar process bone	
	0,270±0,036	0,187±0,014 p=0,07

Note: p - an indicator of the reliability of differences compared with the group «Model MS»

At the same time, elastase activity in bone tissue decreased by 1.4 times, and in serum – by 17 %.

The results of the influence of the «Cuprum Active» complex on the state of the extracellular matrix of the periodontal connective tissue are presented in Table6.

The level of GAG in the oral mucosa of the rats was almost unchanged under the action of the complex. The «Cuprum Active» complex increased the content of bound hydroxyproline in the mucous membrane by 23 % and did not significantly affect the level of total hydroxyproline.

The decrease in serum sialic acids by 24 % indicates, on the one hand, the anti-inflammatory properties of the complex, and on the other, the restoration of the connective tissue intercellular matrix under its influence.

Table 6

The effect of the «Cuprum Active» complex on the state of the extracellular matrix of the periodontal connective tissue and serum of rats (M ± m; p)

Indicators	Blod serum	
	model of MS	MC+ «Cuprum Active»
	blood serum	
Content: -sialic acids (mmol / l)	2,50±0,05	1,89±0,05 p<0,001
	oral cavity mucos membrane	
Content: - GAG (mg / g)	0,95±0,01	0,94±0,01
-oxyproline (μmol / g) -free	346,0±14,2	340±10,0
- associated	60,0±3,50	74,00±2,80 p=0,012
- general	406,0±10,6	414,0±10,5
-Cuprum (mmol/g)	0,77±0,02	0,800±0,017
	alveolar process bone	
Content: - GAG (mg / g)	0,380±0,096	0,760±0,035 p=0,007
-oxyproline (μmol / g) -free	265,0±3,5	302,0±19,0 p=0,08
- associated	32,3±3,0	41,0±0,16 p=0,016
- general	297,0±14,0	343,0±15,0 p=0,05
- Cuprum (mmol/g)	0,011±0,0017	0,027±0,0015 p<0,001

Note: p - an indicator of the reliability of differences compared with the group "Model MS"

In the bones of the alveolar process of rats, in contrast to the oral mucosa, the content of GAG under the action of the complex was doubled. At the same time, the level of free hydroxyproline increased by 14 %, associated – by 27 %, total – by 15%. The detected increase in the magnesium content in the bone of the alveolar process by 2.5 times confirms the improvement in the state of the extracellular matrix of the bone tissue, since It is known that magnesium is necessary for its normal metabolism (Table 6).

The «Cuprum Active» complex significantly reduced the content of MDA in the serum of rats, which indicates its antioxidant properties. In the bone of the alveolar process, the complex significantly reduced the level of peroxide products and activated catalase and glutathione peroxidase (Table 7).

Table 7

The effect of the «Cuprum Active» complex on the content of MDA and the activity of antioxidant enzymes in blood serum and periodontal tissues of rats (M ± m; p)

Animal groups	Indicators		
	MDA content (nmol/ml; nmol/g)	Activity	
		catalases (mkat/ml; mkat/g)	Glutathione peroxidase (μmol/s·ml; μmol/s ·g)
	blood serum		
model of MS	5,80±0,30	4,47±1,23	1,21±0,70
MC+«Cuprum Active»	4,87±0,09 p=0,01	3,78±0,45 p>0,05	2,29±0,16 p<0,05
	oral cavity mucos membrane		
model of MS	54,70±5,81	65,50±7,23	74,0±12,6
MC+«Cuprum Active»	60,60±1,05 p>0,05	58,60±4,36 p>0,05	60,70±8,58 p>0,05
	alveolar process bone		
model of MS	4,64±0,37	9,96±1,23	30,70±5,52
MC+«Cuprum Active»	3,20±0,23 p=0,013	12,40±0,64 p=0,08	52,20±6,68 p=0,05

Note: p - an indicator of the reliability of differences compared with the group «Model MS».

Conclusions. Studies have shown that the «Cuprum Active» mineral and vitamin complex, under the conditions of the metabolic syndrome model, quite substantially negated the negative effects of its most important components in the form of normalization of glucose and uric acid levels and improvement of the functional status of rat liver.

In terms of modeling the metabolic syndrome, the «Cuprum Active» complex in the bone of the alveolar process significantly improved the condition of collagen and GAG, the basis of the intercellular matrix of connective tissue. A significant increase in the content of Mg in the periodontal bone tissue was a positive fact for its normal metabolism.

As a result of improving the mineral metabolism, the complex significantly reduced

the intensity of the caries process in rats when modeling the metabolic syndrome.

The complex reduced levels of sialic acids, peroxide products and rat serum elastase activity. The antioxidant properties of the complex are more pronounced in the periodontal bone tissue of experimental animals.

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ADHESIVE PROPERTIES OF LACTOBACILLUS SPP. AND BIFIDOBACTERIUM SPP. ISOLATED FROM THE INTESTINES OF THE PATIENTS WITH ALZHEIMER'S DISEASE

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Annotation. *The aim of this article was the study of the adhesive properties of the indigenous microflora representatives (Lactobacillus spp. and Bifidobacterium spp.) of the intestines of the AD patients. During the microbiological inspection of 21 patients with AD it had been found out that at 100% of the examined patients showed the qualitative and quantitative dysbiotic changes of the intestines of different extents and symptoms: in 38.1 ± 0.04% of cases dysbacteriosis of the I degree was registered; in 28.6 ± 0.03% – the II degree and in 33.3 ± 0.03% – III degree. Critically low (p <0,05) quantitative indices of Lactobacillus spp. were registered in the patients with AD and the III degree of dysbiosis (lg 4.48 ± 0.15 CFU), and Bifidobacterium spp. – the patients with the II degree have dysbiosis (lg 3.7 ± 0.2 CFU).*

Key words: *Bifidobacterium, Lactobacillus, microflora, Alzheimer's disease.*

Introduction. Nowadays disorders of the cognitive functions and dementia are one of the most frequent reasons of invalidization among the patients of various age. The constant growth of the prevalence of cerebrovascular pathology and also neurodegenerative diseases is noted. According to the WHO data, all over the world there are 47 million patients with dementia now, by 2030 this number will reach 75 million, and by 2050 it will almost triple [1].

Dementia is the most important reason of the disability and dependence of elderly people all over the world and is a heavy burden of people, families, communities and the countries. Its share is 11.9% of the years, existed with the disability, caused by a noninfectious disease [2]. The Alzheimer's disease (AD) is the most frequent reason of dementia [3]. Alzheimer's type demention (Alzheimer's disease) – primary degenerative dementia of the late age, which is characterized by the gradual, hardly noticeable beginning at pre-senile or senile age, the constant progressing of memory and higher cortical functional disorders up to the total intelligence and mental activity disintegration in general at the remote stages of the disease. It is the most common form of primary degenerative dementias. The mechanism of AD development consists in the exchange disorders of the amyloid precursor protein (APP). APP –is a breaking up enzyme (BACE1) together with β-and γ- secretase hydrolyzes APP with formation of β-amyloid (Aβ) and soluble N-terminal N-APP peptide, which is a specific receptor ligand of the tumor necrosis factor (TNF) and promotes caspase-6 activation – an apoptosis enzyme.

Initially APP metabolism is carried out by means of α-secretase, hydrolyzing this macromolecule. As a result the soluble sAPPα form is formed [4].

In general AD is characterized by a decrease in the number of synoptic contacts and reduction of the pool of functional neurons in the cerebral cortex and the central subcortical area that leads to neuronal network degradation. Recent researches have revealed the involvement of neuroinflammation in AD pathogenesis. In particular, it has been established that an increase in the content of interleukin-6 (IL-6) and C-reactive protein in blood serum is associated with deterioration in the informative abilities of the patients with AD [5, 6]. There are the data on direct participation of the necrosis factor of α-tumor (TNF-α) and interleukin-1b (IL-1b) in development of amyloidosis by stimulation of the whole cascade of cytokines [7].

Studying of the interaction between the gut and the brain, that is a so-called gastrobrain axis (gut-brain-axis), by means of which the brain carries out the modulating influence of the function of the digestive tract and the last one – vice versa, is relevant [8, 9]. At the same time, the main components making the axis of microbiota-gut-brain is the central nervous system, neuroendocrinal and neuroimmune systems, the autonomic nervous system, and the system of nervous ganglia intestines and the intestinal microbiota. These components form the complex of multiple-factor network, by means of which the signals from the brain can influence not only the motor, sensory and secretory performance of the intestine, but also its microbiota. To the contrary, visceral signals about the areas of intestines, formed by the microbiota significantly influence brain functions [10].

So, the ability to adhesion of the pathogenic and conditionally-pathogenic clinically significant strains of microorganisms is an initial component in development of the inflammatory process. This mechanism specifies biding of the pathogen to an intact surface and the further realization of the infectious process, by virulence factor production [11]. On the other hand, the adhesive potential of the indigene microflora is one of the factors of realization of colonization resistance of the mucous coat of the intestines and an obstacle to binding to the receptors of the mucous coat of the pathogenic microorganisms [19]. The antagonistic activity of the normal intestines flora is caused not only by the effect of organic acids, but an ability to synthesize specific antimicrobic substances [12].

In our opinion, the results of the practical studying of the microbe-intestines-brain interaction are also extremely important in development of the principles of prevention and treatment not only intestinal disorders, but also such pathogenetic difficult diseases of the central nervous system as schizophrenia, Alzheimer's disease or Parkinson's disease.

Studying of the adhesive properties of the representatives of the indigenous microflora (Lactobacillus spp. and Bifidobacterium spp.) of the intestines of the patients with AD became the aim of our study.

Materials and methods. During the research the condition of the gut microflora was specified according to the methodical instructions [13].

For the purpose of obtaining of Lactobacillus spp. and Bifidobacterium spp. isolates

we have conducted a microbiological research of the gut microflora of the patients with AD (n = 21), also elderly people (n = 21) at the age of 72±0.3 without AD diagnosis, diabetes mellitus, infectious pathologies were included in the experiment, as a group of control (reference group).

Studying of the adhesive activity of Lactobacillus spp. and Bifidobacterium spp. isolates was carried out according to the technique of V.I. Brilis and coauthors. [14].

The statistical processing of the obtained results was carried out by means of the Statistica 6.1 software package with the use of the parametrical Student's t-test.

Results and their discussion. Studying of the issue of the interaction between the intestines and the brain, that is a so-called enterobrain axis (gut-brain-axis) by means of which the brain carries out the modulating influence on the GIT functions, and intestines – on the contrary – regulates the permeability of some substances through the mucous coat of the intestines is relevant today.

Analyzing the results of the microbiological research of the excrements of the patients with AD we had found out that 100% of the examined patients showed the qualitative and quantitative dysbiotic changes of the intestines of different extents of manifestations (Fig. 1).

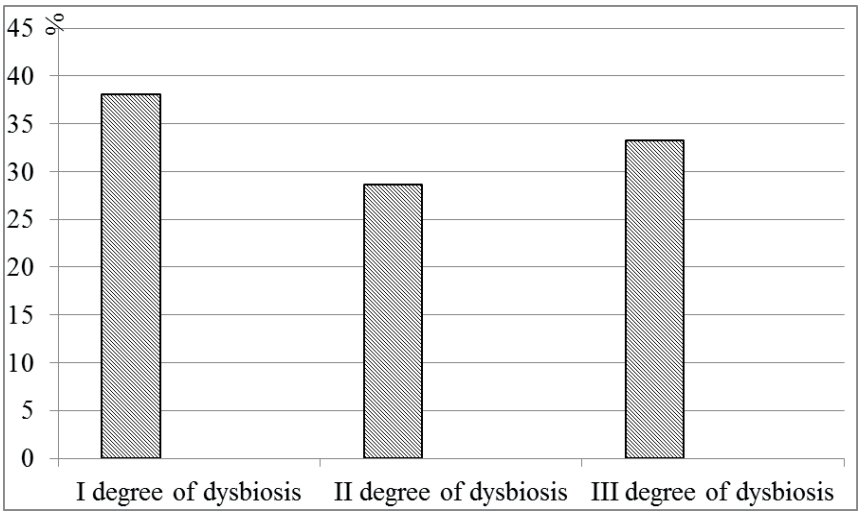

Fig. 1. Frequency and the extent of manifestation of dysbiotic changes of the intestines in the AD-patients.

It should be noted that dysbiotic disorders of the gut microflora in the patients with AD were characterized by the quantitative and qualitative changes in the opportunistic optional and anaerobic and indigenous(bifido-, lactoflora) parts of the gut microflora.

Analyzing the qualitative and quantitative structure of the indigenous microbiota of the patients with AD, it had been established that the most evident qualitative and quantitative disturbances of the content of Lactobacillus spp. and Bifidobacterium spp.

were revealed in the patients with the II and III degree of gut dysbiosis. The quantity of the indigenous microflora authentically decreased ($p < 0,05$) in comparison with the indicators of the reference group: critically low quantitative indices of Lactobacillus spp. were registered in the patients with AD and the III dysbiosis degree (lg 4.48 ± 0.15 CFU), and Bifidobacterium spp. – the patients with the II dysbiosis degree (lg 3.7 ± 0.2 CFU).

It should be noted that bifidobacteria are a "supplier" of a number of irreplaceable amino acids, including tryptophane, vitamins, besides, they have anticarcinogen and their anti-mutagen activity, an ability to reduce the level of cholesterol in blood. The acids, produced by bifidobacteria, bacteriocines interfere with the penetration of microbes into the upper parts of the gastrointestinal tract (GIT) and promote the formation of the nonspecific congenital resistance [15, 16] that is an important component of "the first defense line" of the human body.

Lactobacteria in the course of metabolism produce organic acids (mainly, milk), peroxides, antibiotics and bacteriocines. The formation of these components is regarded as a criterion of the antagonistic activity of lactobacteria that provides their antibacterial effect in relation to the representatives of the pathogenic and opportunistic flora [17, 18].

According to us, such qualitative and quantitative changes in composition of the intestinal microflora of the patients with AD have their serious character: an increase in the degree of semination of intestines by conditionally pathogenic microorganisms (CPM) against the background of a decrease in the quantity of the indigenous (Lactobacillus spp. and Bifidobacterium spp.) microflora breaks the interrelation between making an enterobrain axis (gut-brain-axis) and also can form other pathologies. For example that fact that in $71.4 \pm 0.02\%$ of the patients with AD and the III degree of development of dysbiotic changes of the intestinal microflora a reliable ($p < 0.05$) increase in the degree of the gut C. difficile semination up to 106 CFU was registered against the background of a critical decrease in the degree of Lactobacillus spp. semination can lead to aggravation of the already existing ulcer colitis or to its formation by C. difficile (ulcer colitis in the anamnesis was revealed in $57.1 \pm 0.2\%$ of the patients from the 3rd group).

Such qualitative and quantitative changes in the gut microflora of the patients with AD reduce colonial resistance and can be connected also with a decrease in the adhesive potential of the representatives of the indigenous microflora.

In the course of studying of the indicators of Lactobacillus spp. ($n = 41$) and Bifidobacterium spp. ($n = 33$) adhesion to erythrocytes of blood 0 (1) of the blood type by we have determined that among the isolated strains from the patients with AD there was no one with a high adhesion degree (Fig. 2).

In the analysis of the indicators of the adhesion index of microorganisms (AIM) we have noted differences. So among the "intestinal" Lactobacillus spp. isolates (fig. 2), obtained from the patients with AD, the medium degree of adhesion (AIM values = 3.61 ± 0.05 bact. / red cell.) showed the strains isolated from the patients with the I and II degree of the dysbiotic changes of the intestines. In all the patients with the III degree of the intestine dysbiosis Lactobacillus spp. isolates had their low adhesive activity (AIM

values = 1.93±0.03 bact. / red cell).

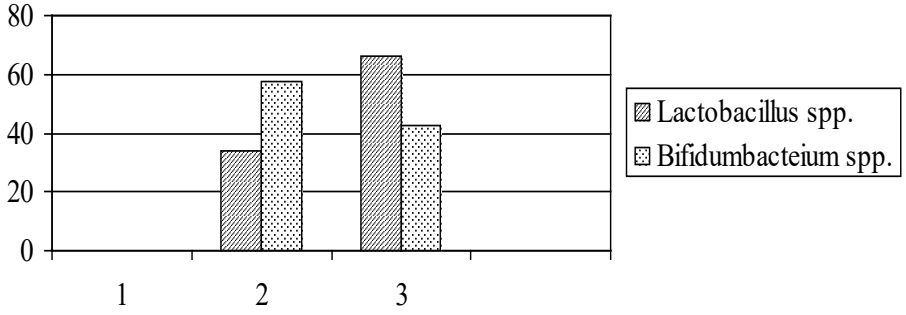

Fig. 2. The quantity of the lactobacteria and bifidobacteria, isolated from the intestines of the patients with AD on the adhesion index (1 – the high AI, 2 – the medium AI, 3 – the low AI).

According to the obtained results on studying of the adhesive properties of Bifidobacterium spp. isolates it has been determined that according to AIM these strains were characterized as low (42.4%) and medium (65.9%) on the level of adhesion (fig. 2), and all clinical Bifidobacterium spp isolates, which had their low adhesive activity (AIM values = 2.12±0.03 bact. /red cell), were isolated from the patients with the I and II degree of dysbiotic intestine changes.

The analysis of the values of the adhesion index of microorganisms of Lactobacillus spp. and Bifidobacterium spp. isolated from elderly people of the reference group has showed: in 76.2% of the examined – Lactobacillus spp. strains had the high level of adhesion (AIM values = 4.15±0.07 bact. /red cell.) and only in 19.04% – the low one (AIM values = 2.23±0.04 bact. /red cell); in 47.6% of the examined – Bifidobacterium spp. strains were high-adhesive (AIM values = 4.23±0.06 bact. /red cell.) and in 28.6% o – low-adhesive (IAM values = 1.93±0.04 bact. / red cell.). Besides, from those elderly people from the reference group we have not obtained the results of the microbiological study of the gut microbiota, which were characteristic of the dysbiotic disorders of the III degree (a decompensation dysbiosis form).

In the second series of the experiment with the isolates of indigenous intestinal microflora, we carried out cultivation of the clinical strains of Lactobacillus spp. and Bifidobacterium spp., obtained from the patients with AD on skim milk within 48 hours: 1 ml of Lactobacillus spp. suspension or Bifidobacterium spp. in the number of 0.5 units, according to the McFarland standard were added to 10 ml of sterile skim milk. After cultivation of these strains their adhesive activity were studied. As a result of the analysis of the obtained results an increase in the adhesive activity of the all studied bacteria in comparison with control is considered to be reliable ($p < 0.05$) (the first series of the experiment – primary isolation from the patients): Lactobacillus spp. and

Bifidobacterium spp. were characterized by the medium adhesion activity. So, the AIM of Lactobacillus spp. (n = 41) in the sampling made 3, 86±0.07 bact. /red cell (from 2.91 to 6.9 bact. /red cell.): 12.2% of lactobacteria had the high adhesive activity, 24.4% – the low adhesive activity and 63.4% – the medium adhesive activity.

In bifidobacteria (n = 33) after cultivation in the sterile skim milk the AIM of Bifidobacterium spp. in the sampling made 3, 86±0.07 bact./red cell. (from 2.91 to 6.9 bact./red cell.): 21.1% were considered as high-adhesive strains, whereas most of them showed the medium (66.7%) adhesion ability and only 12.2% of bifidobacteria strains had their low adhesive potential. The AIM of Bifidobacterium spp. (n = 33) in the sampling made 2.96±0.06 bact. /red cell. (from 2.8 to 5.7 bact. / red cell.)

There are many effects of the gut microbiota on various systems and organs, for example, the bacterial intestinal microflora can directly influence the central nervous system through the products of active mediators: serotonin, melatonin, piperidic acid, catecholamines, histamine and acetylcholine, a part of which are the main neurotransmitters and can influence not only the intestinal nervous system, but also first of all – the central one [20].

The obtained results confirm the individual specific nature of adhesion of the "intestinal" indigenous microflora of the patients with AD. From the practical point of view it confirms a need of the individual selection of probiotics in case of dysbiosis therapy replacement. On the other hand, the pro-biotic microorganisms, introduced in a macroorganism are capable to provoke imbalance in the host's automicroflora owing to antagonism of the indigenous and industrial strains [21]. In our opinion, one of the priority directions of the modern dysbacteriosis therapy and prevention for elderly people can have a creation of the personalized "gut biobank" of the indigenous microflora and the use of autologous strains of microorganisms – the representatives of the protective microflora (autoprobiotic) as probiotics.

Conclusions. During the microbiological inspection of 21 patients with AD it had been found out that at 100% of the examined patients showed the qualitative and quantitative dysbiotic changes of the intestines of different extents and symptoms: in 38.1 ± 0.04% of cases dysbacteriosis of the I degree was registered; in 28.6 ± 0.03% – the II degree and in 33.3 ± 0.03% – III degree. Critically low ($p < 0,05$) quantitative indices of Lactobacillus spp. were registered in the patients with AD and the III degree of dysbiosis (lg 4.48 ± 0.15 CFU), and Bifidobacterium spp. – the patients with the II degree have dysbiosis (lg 3.7 ± 0.2 CFU).

34.1% of strains of Lactobacillus spp. obtained from the patients with AD showed the medium adhesion degree (AIM values = 3.61±0.05 bact. /red cell), obtained from the patients with I and II degree of dysbiotic changes of intestines; in 33.3% of the patients with the III degree of the intestine dysbiosis Lactobacteria spp. isolates had their low adhesive activity (AIM values = 1.93±0.03 bact. / red cell).

Bifidobacterium spp. isolates were characterized by the low (42.4%) and medium (65.9%) adhesion level, and all the clinical isolates, which had their low adhesive activity (AIM values = 2.12±0.03 bact. /red cell.), were isolated from the patients with I and II

extent of dysbiotic changes of intestines.

After cultivation of the "intestinal" strains of the indigenous microflora on skim milk within 48 hours a reliable increase in the adhesive activity of the all studied bacteria in comparison with the control has been revealed ($p < 0.05$) (the first series of the experiment – primary isolation from the patients): Lactobacillus spp. and Bifidobacterium spp., were characterized by the medium adhesion activity.

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TECHNICAL SCIENCES

OPEN GOVERNMENT DATA-BASED SERVICES AS A DIGITAL GOVERNMENT DEVELOPMENT TOOL

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Annotation. *Examples and application directions of open data based services for solving public administration problems in the context of digital government development are considered. Pointed service classification, according to information processing types, sources, mode and data representation methods.*

Key words: *digital government, government data, government data-based services.*

Articulation of issue and recent publications analysis. An important driver in the assurance of public administration performance and openness in the digital world is its reformation and transformation on the modern digital technologies basis, the transition from "electronic" to "digital" government. That implies "the complete transfer of public services into a digital format as from applying for these services to their execution and the reaching of such a state, where the departmental processes are primarily based on data, not documents" [1, p.5].

By providing the "digital government" architecture, advanced countries are focusing on data-related issues: forming national databases, which are available for general access in the public placement, national information infrastructures are complemented by non-governmental organizations datasets for sharing by public, commercial and non-profit organizations. State governments are appointing data directors, implementing an open data policy and data reusing strategy [1].

For the extensive use of government data, which includes open data, it's necessary to create accessible services for working with them on the modern digital technologies basis. For today, several dozen online services have been implemented on the open data basis in Ukraine. In the vast majority there are socially significant (anti-corruption) or commercial ones. In recent years the necessary legislative framework has been designed for the public administration needs services development. It regulates the electronic information interaction organizing of state electronic information resources and electronic identification issues. Implementation of state electronic information resources interactions is among the e-government development priority tasks [2]. Among the initiatives, running in this area, takes place the software applications (API, script, etc.) development competition for the public information disclosure in the open data form or the open data-based services (analytical, informational, interactive, etc.) creation . It is conducted under the USAID / UKAID "Transparency and accountability in public administration and services "(TAPAS) project [3]. Taking the above mentioned into

consideration, the research topic is relevant.

The issue of using government data in the digital government development context had been considered in a number of publications, including The World Bank and OECD studies. Many foreign and domestic scientists and specialists works are devoted to the public information in the open data form provison, among them: L.James explores the "open data" definition [5], B. Ubaldi highlights the main principles, concepts and criteria for the government Initiatives on open data formation and their implementation problems [6], A. Gazin analyzed the factors influencing the open data ecosystems development in Ukraine and elaborated recommendations for the open data policy implementation [7], P. Klymushyn and D. Spasibov outlined the problems with the state data opening in Ukraine and the urgent tasks for the open data-based services[8].

The purpose of the article is to analyze the government data, incl. open data -based services potential for the public administration objectives implementation in the context of "digital government" development.

Statement of basic materials. Public administration authorities collect or produce a large amount of information for their own requirements or on their own activities basis. It's called public information.

According to our studies objectives, among the public information structure elements, can be identified government electronic information resources (GEIR), open data and big data (Fig. 1).

Government electronic information resources (GEIR) –is the information in electronic form, which is in the governmental property and it's necessity to protect is defined by law (electronic registers, national inventories, state and other mandatory classifiers) [9].

Big data is data that cannot be processed with standard tools by the reason of its considerable amounts and requires special software and hardware [6]. In the public sector, big data is accumulated in the public services provision, social benefits management, health care, and so forth.

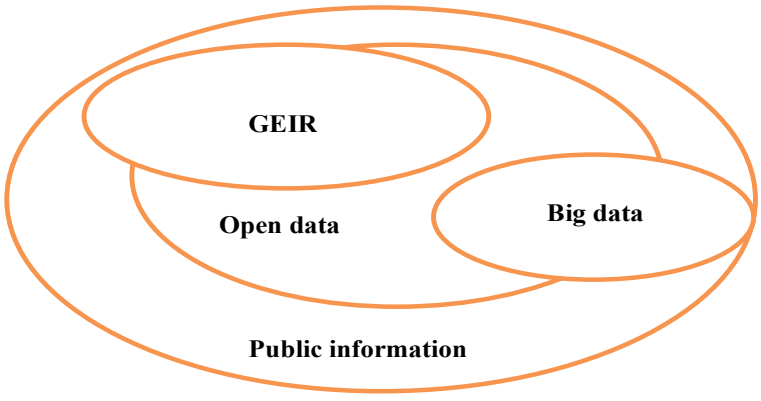

Fig. 1. Public information structure.

Most of the public information, except for data constituting confidential or secret information is published in the open data form.

Open data is data presented in machine-readable formats and is reusable without any publisher control [8]. Usually this is achieved through the use of open-access licenses that accompany open source data arrays. The basic principles for government data opening are set forth in the International Open Data Charter. Those principles are: opening data by default, quality and quantity, using all published data for the managerial efficiency increasing, data publishing for innovations introduction [10].

Data representation in computable formats allows you to use it multiple times with the help of software (services, applications).

Government data-based services (GDBS) can be applied at all stages of the state data value chain, which, as indicated in [6], covers data generation; data collection, aggregation and processing; data distribution, delivery and the use of final data.

GDBS, incl. open data, have strong potential in improving public administration efficiency by digitizing services, automating intra-departmental and interdepartmental operations, expanding the informational and analytical bases and introducing innovative tools for the public administration objectives implementing.

The benefits of using public data-based services in public administration are related to the possibilities of:

- co-processing of various departments databases, which contain primary information;
- other organizations open data (for example, geospatial) connection to processing with public data sets
- creation of new datasets access channels and interdepartmental information communications;
- use of open data-based services developed by commercial and non-profit organizations;
- work with data online;
- visualization of aggregated information;
- start-up projects attraction into service development process.

Using of GEIR (databases and data registries) collected by various institutions at the central, regional and municipal levels allows government data-based utilities to develop digital public services. At the same time, the interdepartmental interaction technology is changing: interdepartmental operations are carried out through direct and secure access to departmental data, without using documents in electronic form. As a result, not only the public services quality is improved due to their complete automation, but also the government employees' repetitive operations and routine tasks dismissal and more efficient data usage.

Among the main public administration objectives, effectiveness and efficiency can be improved through the use governmental data-based services, development and adoption of management decisions, the development of a public policy in a specific field, coordination and control of activities, the state statistical information development,

forecasting and planning, etc. (Fig. 2).

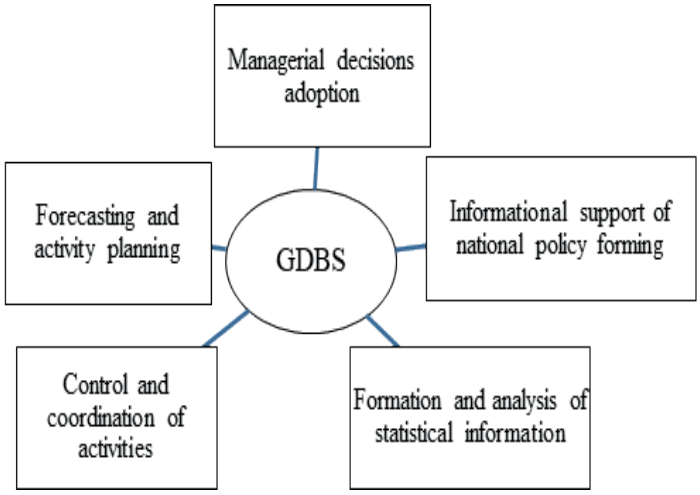

Fig. 2. The use of national data-based services (GDBS) to meet the challenges of public administration

Due to the possibility of the large amount of information, stored in the DEIR and non-state institutions open datasets, analyzing on certain public administration processes, objects, actions, the appropriate services allow to improve the quality of analytical work in developing and management solutions issuance for shaping public policy in a certain area.

For example, the Ukrainian service of first car registration information (texty.org.ua), created on the open data basis of Unified State Register of the Ministry of Internal Affairs, which displays registered vehicles and their owners. The service allows you to compare data on vehicles registration by region, issue date, brand, model, engine capacity, fuel type, etc. Particularly, this information can be used in the formation and regulation of environmental policies.

Government data-based services can be used as a coordinating tool for the various departments' activities at the municipal level, organizing the interaction of government agencies in emergency situations through the use of geospatial data and other information from various sources.

Using direct access to departmental data, which contains primary information, as well as to open data from other sources, can significantly improve the control functions quality, for example, the Zakupivli 2.0 service (z.texty.org.ua) that enables to view the certain state institution or city council purchases, costs, counterparty information since 2008.

The services potential realization in state statistics is associated with the using of various departments data, containing primary information and big data as statistical information tool kits and sources [11].

For example, it's planned to implement an agricultural crop areas monitoring service in Ukraine. Itis already successfully operating in many countries and is aimed to obtain operational information about land resources, crisis and degradation processes, crop condition and yield capability forecasting with the Earth remote sensing tools,. Uptaken with its help, information on the crops acreage can be a statistical source, and at the same time a tool to combat the black economy.

GDBS will help to deduce a deeper understanding of the certain socio-economic processes and phenomena tendencies and interrelations for making strategic decisions in public administration through the aggregation and analysis of data from various sources, including non-governmental organizations and their use in predicative models.

Public, incl. open data-based services for solving public administration problems can be classified by the information handling process, the type and display mode (Table 1).

Table 1

Open data-based services classification

Attribute	Characteristics
1) the information handling process	
Searching	search for information (texts, documents, their parts, factographic records, visual data) stored in electronic form in data warehouses (databases) according to formal characteristics.
Aggregation	converting a group of observations into observations containing aggregated information on the corresponding group, and creating a new - aggregated dataset
Statistical	information representation in a formalized form in accordance with generally accepted principles and methodology, by combining, grouping of primary data, including quantitative and qualitative characteristics of facts and processes
Analytical	generalization and classification of collected information, its analysis and transformation; conclusions, proposals, recommendations and forecasts development
Intelligent analytics	the regularities detecting computational process in large sets of data using methods at the intersection of artificial intelligence systems, machine learning, statistics and database systems
2) Data display type	
Cartographical visualization	images generation, including geo-images, cartographic images and other geospatial data-based graphs
In a report form	graphical, tabular and factual information representation (based on the results of information search, analytical, statistical processing and aggregation)
Mashup	The data, presentations or functions (from two or more sources) using and pooling technology,
3) Data display mode	
In real time mode	Information processing is provided at a close to the real life process speed, records data with the appropriate detecting instruments.
During the monitored period/as of the date	Displays data under a specific time period or for a fixed time point.

An important services advantage is the possibility of flexible virtual integration of government data, without the need for information systems reengineering and centralized

data collection from source databases.

The conditions for the public administration sphere services widespread implementation are the presentation of government data in a constrained data format, providing access to them through application program interfaces (server-side Web API) and the cloud computing technology use [8].

The economic efficiency achievement of governmental data-based service implementation is related to: the development of standardized solutions for use at the municipal, regional levels, the performance of typical tasks in the central authorities work; co-financing of common projects (programs) aimed at the services with state, international, public organizations (funds) development; involvement of start-up projects in the national data-based services implementation.

Among the benefits of creating government data-based services for public administration needs is the motivation enhancing of public information managers on the state data development, including open data as their working tool, in particular, for the state data quality control (completeness, statefulness, purity) and data relevance maintaining.

Among the factors that impede the creation of national, incl. open data-based services for public administration problems solving, which require solutions at the state level in Ukraine, the following should be noted [7]: the lack of a unified data sets register and the national open data development concept ; the lack of a unified approach to the public data collection, storage and management in electronic form; lack of data persistence infrastructure; insufficient public authorities staff training level in working with open data; lack of funding.

Conclusions. Successful realization of the governmental (including open) data potential is a driver for a "digital government" development. It comes with a new quality of services for citizens and businesses and more effective public administration.

Among the new approaches is the common multiple use of government departments databases, the formation of a unified information structure, with the non-governmental organizations open data inclusion and the creation of services, based on them. By complementing and expanding the information systems and electronic document management systems capabilities, GDBS helps to realize the digital format of public services with full administrative processes automation in the public administration authorities activities; to provide a new information and analytical support quality level for managerial decision-making processes and the state policy formation in various fields, coordination and control, statistical accounting, planning and forecasting of activities and so forth.

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