SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

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这些会议文集结合了会议的材料 – 研究论文和科学工作者的论文报告。 它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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CONTENTS

ECONOMICS

PEDAGOGICAL SCIENCES

SOCIOLOGICAL SCIENCES

PHILOLOGICAL SCIENCES

CULTUROLOGY

POLITICAL SCIENCE

PSYCHOLOGICAL SCIENCES

出口禁令对俄罗斯产品产量的影响*
THE IMPACT OF THE EXPORT BAN ON THE OUTPUT OF PRODUCTS IN RUSSIA[1*]

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注解。 在当代经济中，商品的生产、储存和交付存在技术、经济、运输环节。因此，新产品的出现或现有产品产量的增加需要改变其他产品的生产，并通过技术链与该产品相关联。 投入产出平衡的统计数据和模型使我们能够追踪这种联系链并计算不同商品的产量。 本文包含对俄罗斯出口禁令和限制的跨部门影响链的研究结果。 结果表明，某些商品的出口减少对其他一些商品的输出产生负面影响。

关键词：出口，跨行业关系，商品和服务的生产量。

Annotation. There are technological, economic, transport links in the production, storage and delivery of goods in the contemporary economy. Therefore, the appearance of a new or an increase in the volume of production of an existing product requires changes in the production of other products, linked with this one through the technological chains. Statistical data and models of input-output balance allow us to trace such chains of connections and calculate the volumes production of different goods. This paper contains the results of a study of intersectoral chains of influence of bans and restrictions imposed on Russian exports. It is shown that the reduction in the export of some goods has a negative effect on the output of a number of other goods.

Keywords: exports, cross-industry relations, the volume of production of goods and services.

Initial data for calculations

Large-scale anti-Russian sanctions imposed by countries unfriendly to the

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Russian Federation[2] prohibit the export of a wide range of Russian goods (see, for example [3]-[5]). Researchers from a number of countries assess the impact of barriers, prohibitions and restrictions that hinder Russia's foreign trade in different ways [6]-[10]. Based on the intersectoral relations that have developed in the economy of the Russian Federation, let us assess the production of which products will suffer with a decrease in the export of ten domestic goods. We will make an assessment based on data from the Table of the use of domestic products in basic prices for 2019, presented on the website of the Federal State Statistics Service of the Russian Federation (Rosstat) [11][3]. It has 61 products (OKPD 2) and 61 industries (OKVED 2). For the study we selected the products and services, presented in this table, with a significant share of exports in the volume of their production, the export of which is restricted by numerous prohibitions and restrictions from countries unfriendly to Russia, are selected for analysis (Table 1).

Table 1.

The share of product exports in the volume of its use and in total exports in 2019, %

Product	In the volume of use	In total exports
Mining products	49,9	31,7
Chemical substances and chemical products	46,5	5,5
Coke and petroleum products	37,3	13,8
Basic metals	36,3	9,9
Air and space transport services	34,5	2,0
Means of transport and equipment, other	30,7	2,7
Finished metal products, except machinery and equipment	20,6	2,0

Source: the table is compiled by the author according to Rosstat (URL: https://rosstat.gov.ru/statistics/accounts (accessed: May 20, 2022).

Effects of restrictions on exports from Russia

To assess the impact of exports' reduction on the output of other types of products, we decrease one be one the volumes of exports of 10 types of products and services. These ten products were the following: mining products, coke and petroleum products, basic metals, food products, beverages, tobacco products, chemical substances and chemical products, means of transport and equipment, land

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2 The list of foreign states and territories committing unfriendly actions against Russia was approved by the Decree of the Government of the Russian Federation Order No. 430-r, March 5, 2022 [1] and enlarged by Decree of the Government of the Russian Federation Order No. 430-r, July 22, 2022 [2].

3 URL: https://rosstat.gov.ru/statistics/accounts) (accessed: May 2, 2022).

and pipeline transport services, finished metal products, except machinery and equipment, air and space transport services, products and services of agriculture and hunting, food products, beverages, tobacco products. Top seven of them are presented in the Table 1. In each calculation exports of only one group of products and services are reduced by 10 percent. The results of the calculations are shown in the Table 2.

Table 2.

The estimated rate of reduction in the exports and in the volume of gross used product in the Russian Federation caused by a decrease in exports of the products and services by the same specified amount, % (the maximum decline = 100%).

Product	Exports	Volume of used product
Mining products	100,0	100,
Coke and petroleum products	92,6	98,9
Basic metals	64,3	68,2
Chemical substances and chemical products	45,3	47,6
Means of transport and equipment	28,0	30,6
Finished metal products, except machinery and equipment	19,6	20,6
Air and space transport services a	19,1	19,5

Source: the table is compiled by the author according to Rosstat [12].

According to calculations, in the conditions of inter-industry relations in Russia in 2019, the largest drop in output occurs with a decrease in Russia's exports of mining products. These maximum values are taken as 100%[4]. A drop in the volume of Russian exports of basic metals by the same relative value reduces the total volume the Russian Federation's exports by 35.7 percentage points (pp.) and the volume of gross used product by 31.8 pp. less than the decrease in exports of mining products: ,0-64,3 = 35,7; 100,0-68,2 = 31,8. The smallest drop in exports and gross used product occurs when exports of air and space transport services falls: 19.1% and 19.5% of the reduction in the case of a decrease in exports of mining products.

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4 Relative values are sufficient to show the strength of intersectoral chains influence and to show decision makers in the Russian Federation what to pay attention to when making variants of economy development in the conditions of external attempts to isolate the Russian Federation from the world markets of goods, services, finance. The author deliberately does not give absolute figures here in order not to give analysts hostile to Russia the opportunity to assess the damage caused anti-Russian sanctions.

According to the value of the drop in gross used product the products in question are arranged in the following order (from maximum to minimum):
– mining products,
– coke and petroleum products,
– basic metals,
– food products, beverages, tobacco products,
– chemical substances and chemical products,
– means of transport and equipment,
– land and pipeline transport services,
– products and services of agriculture and hunting,
– finished metal products, except machinery and equipment,
– air and space transport services.

A decrease in the volume of exports of each type of goods under study causes a reduction in the output of a number of other products. The calculations made it possible to establish such products and services. Thus, with a decrease in exports of mining products, primarily falls the output of coke and petroleum products, machinery and equipment not included in other groupings, land and pipeline transport services, warehousing and auxiliary transport services, rental and leasing services. A drop in the export of vehicles and equipment entails a reduction, first of all, in the volume of production of base metals, finished metal products, except machinery and equipment, computer, electronic and optical equipment, electrical equipment, machinery and equipment not included in other groupings.

It should be noted that the decline in exports of different types of products and services affects the output of a number of the same products. Some examples are given in the Table 3.

Table 3.

Products and services in the top five goods in terms of the rate of decline in output caused by a decrease in exports of certain products

Exported products and services	Manufactured products and services
Mining products Coke and petroleum products	Land and pipeline transport services; water transport services, rental and leasing services
Chemical substances and chemical products Basic metals	Mining products; land and pipeline transport services; electricity, gas, steam and air conditioning
Products and services of agriculture and hunting food products, beverages, tobacco products	Fish and other products of fishing and fish farming; paper and paper products; chemical substances and chemical products
Chemical substances and chemical products Air and space transport services	Coke and petroleum products; warehousing and auxiliary transport services; mining products

Source: the table is compiled by the author

Concluding remarks

In May 2022, the results of calculations performed by a senior economist at the Bank of Finland Institute for Emerging Economies (BOFIT)[5] Heli Simola were published. Her calculations were made on the basis of t multi-regional input-output table for 2019, compiled by the Asian Development Bank (ADB)[6]. According to this calculations "a ban on imports from Russia hits hardest commodity branches such as mining, oil refining and wood manufacturing" [9, p. 7]. They are they are followed by water transport and base metals.

Our calculations revealed not only the most sensitive commodity groups to the reduction in exports, but also products related to them by technological chains, as well as products and services, the production of which noticeably reacts to a decrease in exports of many types of goods. Knowledge of such dependencies and the power of influence allow calculating the consequences of various restrictions and prohibitions on the export of products and services.

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如何评估和最小化单一目的业务流程执行者的物理和智力资源成本的变化
HOW TO EVALUATE AND MINIMIZE THE VARIATION OF THE COSTS OF PHYSICAL AND INTELLECTUAL RESOURCES OF PERFORMERS OF SINGLE-PURPOSE BUSINESS PROCESSES

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注解。 结果表明，使用原始的劳动强度评估方法可以*确定不同结构部门的人员工作量程度，*经济地评估跨部门重新分配工作的可行性并计算员工人数。 已经确定，使用 IDEF0 和/或 IDEF3 模型和 UML 图的业务流程可视化提供*模拟模型的自动合成，并降低财务和人工成本，以实施与评估业务流程复杂性和劳动强度相关的程序 .
关键词: 资源成本、劳动力资源、劳动强度、IDEFi模型、UML图、资源强度方差

Annotation. *It is shown that the use of the original method of assessing labor intensity allows *to determine the degree of personnel workload in different structural divisions, *to economically assess the feasibility of redistributing work across divisions and calculate the number of employees. It is established that visualization of business processes using IDEF0 and/or IDEF3 models and UML diagrams provides *automated synthesis of simulation models and reduction of financial and labor costs for the implementation of procedures related to the assessment of the complexity of business processes and labor intensity.*

Keywords: resource costs, labor resources, labor intensity, IDEFi models, UML diagrams, variance of resource intensity

Introduction. Currently, it is not customary to assess the real *possibility* of performing a specific business process (technological, managerial) as a whole or with a given probability. But it's no secret that the *relative number* of performers of the same business processes (*single execution under the same conditions*) in different institutions can differ quite significantly (for example, in tax inspectorates in different administrative-territorial entities, in the accounting departments of different universities, ...).

It turns out that *in some organizations*, the implementation of a specific business process for one purpose *requires much less effort from performers, less phys-*

ical and intellectual labor than in others. At the same time, the *actual level of loading* of performers of the same business processes will also be different. True, people are also very different in their creative abilities and skill levels.

It is obvious that a *higher level of loading of performers* of specific business processes (higher costs of physical and/or intellectual resources of performers) in some divisions (departments, sections), their **more intense work compared to performers in other divisions** should be somehow rewarded: such performers could receive compensation, for example, in the form of additional payments to wages, bonuses or additional days for vacation, etc.

But how to detect and evaluate the difference in the *intensity of work* of executors of business processes of the same purpose? How to detect and evaluate the difference in labor intensity *in different departments of the same organization*?

After all, it is known that the existing methods for assessing the intensity of work, having many obvious shortcomings: (*low accuracy and difficulty in interpreting the results of the assessment, a large number of indicators used, large labor costs for conducting experimental studies,* etc.), do not allow solving a number of problems in the field of labor economics, associated with an objective analysis of the *degree of workload* of personnel, identifying the *most labor-intensive* subsets of operations and processes, *comparing* business processes in terms of labor intensity, calculating the *number of employees* necessary to complete a specific business process, identifying *reserves for increasing labor productivity*, providing (*by reengineering*) a given *probability* of performing a specific business process within a certain time. Therefore, it is necessary to develop *more informative* methodological technologies to solve an urgent problem in the field of *labor economics*, aimed at obtaining representative results of the study of labor intensity.

Now the main problem remains: how to *quantify* this *difference in the level of labor intensity*, in the level of workload of performers, the difference in the cost of physical and / or intellectual efforts to perform specific business processes.

Here, an original author's approach to estimating and minimizing the dispersion of the distribution of the level of intensity of labor processes of one purpose is considered. First, we recall that there is a "*dimensionless measure of dispersion of the distribution of a random variable*" [1] - the coefficient of variation, which is "*most often*" defined as the ratio of the standard deviation to the mathematical expectation of a random variable.

The peculiarity of the proposed method lies in the assessment and comparative analysis of the resource intensity of the work (time, labor and financial resources) performed by the business process executor, i.e. an *economic* approach is being implemented to assess the intensity of business processes [2].

1.Estimation and minimization of the dispersion of the distribution of labor costs of executors of business processes of the same purpose. When using

the method of economic assessment of labor intensity to assess and minimize the dispersion of the distribution of costs of physical and intellectual efforts of performers performing the same business processes and / or the same operations, the following steps are assumed:

Step 1. The list of works (business processes) performed by the personnel of the structural unit is determined;

Step 2. Each work (labor process) is divided into elementary operations;

Step 3. Statistical characteristics *of the time spent on performing operations are determined (according to chronometric observations, retrospective analysis or by expert means - the minimum, maximum and most probable execution time are estimated); *number of executions of each elementary operation (per day, month or year).

Step 4. Visual *IDEFi*- and/or *UML*- models of each business process are formed [3-10]. The use of *IDEFi*- and/or *UML*- models provides *a visual representation of the functions* that the team of a particular structural unit performs, allows you to *see* how diverse the set of operations that each specific performer must perform. Indeed, often *business processes* and technological chains of operations are formed in such a way that the management of an organization or its structural unit is *not able* to present a picture of the process **as a whole**, to assess the **interconnectedness** of individual processes and operations. At the same time, the constructed visual models are quite *accessible for understanding* the audience for which they are created - *both for direct* performers *and for heads of structural divisions*.

Moreover, the creation of a converter of *IDEF*0-models into *UML*-diagrams (publication of the algorithm - in 2008, registration of the program with ROSPATENT - in 2009) makes it possible to integrate the converter with the system of automated synthesis of simulation models SIM-*UML*. Options for converting *IDEF*3 models into *UML*- activity diagrams for further modeling in the SIM-*UML* system are presented. The possibility of joint use of *IDEF*0 and *IDEF*3 models allows expanding the range of simulated tasks and introducing additional information about the subject area into the model [3, 4, 6-8]. The development of an algorithm for converting *IDEF*3 models into *UML* diagrams made it possible to use the SIM-*UML* system for express assessment and optimization of the resource intensity of business processes in various subject areas, and contributed to the formation of a universal simulation toolkit.

Step 5. Automated synthesis of simulation models of business processes is carried out, for example, using the developed software products [11]. SIM-*UML* software system allows you to: design a visual model; generate the program code of the simulation model; conduct simulation modeling, obtain statistical characteristics, a table and a histogram of the distribution of labor costs for the imple-

mentation of any business processes. As part of the functions of the SIM-*UML* 2.0 system, *an expression constructor*, a converter from the IDEF3 *notation, a subsystem for collecting statistics based on simulation results,* etc. are implemented.

The use of the developed software systems makes it possible to *reduce the labor costs* for creating a simulation model of a business process *tenfold*.

Step 6. Simulation modeling of business processes performed in the structural divisions of the enterprise is carried out. Moreover, if the model is created using the *IDEF*0 or *IDEF*3 notation, then the model is first converted into *UML*- diagrams, and then the simulation model is synthesized. As a result of modeling, statistical characteristics (mathematical expectation, dispersion, coefficient of variation, kurtosis, asymmetry), tables and histograms of the distribution of the execution time of business processes as a whole for the structural unit and for individual performers are obtained;

Step 7. Determine for each business process and each executor the actual *time required* to perform routine maintenance with a given (selected by the researcher, manager) *probability value, using* the empirical laws of distribution of the execution time obtained as a result of simulation modeling * business processes in the structural unit and *work assigned to individual performers.

Step 8. The *level of labor intensity* in the structural subdivision of the enterprise is estimated by calculating the **ratio** of the calculated *time spent on the performance of routine maintenance* assigned to a specific structural subdivision to the *standard time fund of all employees* of the structural subdivision. Similarly, the level of labor intensity (load) *of each performer separately* is assessed, i.e. the **ratio of the time spent on the performance of work by a specific contractor to the normative time fund of this contractor is calculated**.

APPROBATION of the method: We will show a variant of using the proposed method for assessing labor intensity using the example of *assessing labor intensity* in the structural unit for registration and accounting of taxpayers of the district tax inspectorate.

In accordance with the described algorithm for assessing the intensity of labor in *relation to the selected* business process, in particular, the following was done: *construction of *UML*- models that *visualize the structure* of business processes in the subject area under study; *construction of a *detailed* list of operations performed by employees of the tax inspectorate; *carrying out *timing and expert studies* to assess the *labor costs* for each operation; *determination of statistical characteristics and laws of distribution of the number of requests for operations; *simulation modeling* of business processes to *predict the labor costs* for the implementation of various *subsets* of functional operations.

The process of registration and accounting of taxpayers includes 93 operations. Table 1 shows a fragment of the initial data for modeling; here: n_i – number

of executions **i**-th business process activities, and t_i – execution time (labor costs for this operation).

Table 1

Frequency and time of performance of functional operations by employees of the department of accounting and registration of taxpayers

Frequency of performing a functional operation					Labor intensity (time) of performing a functional operation				
Variable	Unit of measurement	Minimum value	Maximum value	Most likely value	Variable	Unit of measurement	Minimum value	Maximum value	Most likely value
…	…	…	…	…	…	…	…	…	…
n_{1003}	pc./month	155	310	200	t_{1003}	min./oper.	2	5	3
n_{1004}	pc./month	150	300	193	t_{1004}	min./oper.	1	3	2
…	…	…	…	…	…	…	…	…	…
n_{1025}	pc./month	20	40	30	t_{1025}	min./oper.	5	10	7
…	…	…	…	…	…	…	…	…	…
n_{1073}	pc./month	20	30	25	t_{1073}	min./oper.	5	7	5
…	…	…	…	…	…	…	…	…	…

Table 2 shows a fragment of the simulation results. Here: M_T, σ_T, k_v - respectively, the mathematical expectation, the standard deviation and the coefficient of variation in the execution time of the business process operation.

Table 2

Results of statistical (simulation) modeling

Variable	M_{T_i}	s_{T_i}	$T_{i\,min}$	$T_{i\,max}$	k_v	$s^2_{T_i}/M_{T_i}$
...	…	…	…	…	…	…
T_{1003}	736,3	109,4	507,5	1038,3	0,15	16,23
T_{1004}	426.6	107.5	168.6	807.5	0.25	27,1
…	…	…	…	…	…	…
T_{1023}	30,05	4,13	20,6	43,4	0,14	0,57
T_{1024}	223,3	31,6	136,2	317,8	0,14	4,47
T_{1025}	216,3	30,63	135,7	299,4	0,14	4,34
…	…	…	…	…	…	…

T_{1073}	139,03	11,9	108,8	171,6	0,1	1,02
…	…	…	…	…	…	…

Table 3 shows the coefficients of skewness and kurtosis of the distribution of labor costs for the operation T_{1004}, and table 4 – shows the accumulated probability of *time spent* on the operation.

Table 3

Coefficients of asymmetry and kurtosis of the distribution of labor costs for the operation T_{1004}

Parameter	Meaning
Number of iterations	1000
Asymmetry	0.43
Excess	0.018
modal spacing	342.8 : 400.9

Table 4

Characteristics of the distribution of labor costs to perform the operation T_{1004} – the accumulated probability of labor input falling into a specific range of values: X_{min} - X_{max}

X_{min}	X_{max}	Frequency	Probability of falling into a specific range of values	Cumulative probability
168.6	226.7	14	0.014	0.014
226.7	284.8	73	0.073	0.087
284.8	342.8	138	0.138	0.225
342.8	400.9	217	0.217	0.442
400.9	459.0	194	0.194	0.636
459.0	517.1	176	0.176	0.812
517.1	575.2	98	0.098	0.910
575.2	633.3	44	0.044	0.954
633.3	691.4	29	0.029	0.983
691.4	749.5	15	0.015	0.998
749.5	807.5	2	0.002	1.000

Analysis of the results of simulation modeling made it possible to identify the most time-consuming functional operations of the business process of registration and accounting of taxpayers (tab. 5).

*The most time-consuming functional operations of the business
process of registration and accounting of taxpayers*

Designation	M_{T_i} , min./months	Designation	M_{T_i} , min./months
F_{1011}	6299,28	F_{1050}	2309,90
F_{1015}	1995,36	F_{1058}	1889,37
F_{1030}	1617,67	F_{1061}	2101,16
F_{1037}	1826,29	F_{1062}	1610,02
F_{1038}	1820,51	F_{1069}	1744,65
F_{1047}	2100,27	F_{1072}	1994,06

The results of modeling business processes performed in the structural unit for registration and accounting of taxpayers showed that the *total time spent* on the implementation of the entire subset of functional operations is 1150 hours, the normative fund of staff time is 1190 hours. Then the **intensity of labor** in this unit will be determined as the **ratio (1150/1190) equal to 0.96.**

Conclusion. Using the proposed original method for *estimating labor intensity* to **minimize** the dispersion of the distribution of a random variable - *the cost of physical and intellectual efforts of executors* of business processes of the *same purpose* 1) Allows the following **with minimal resources**:

*receive the most *accurate **assessment of labor intensity** in the performance of production and management processes;

*determine the **labor intensity** of each operation of the business process, *identify* the most labor-intensive (*resource-intensive*) *operations*;

*conduct a *comparative* quantitative analysis of labor costs for various options for organizing a business process;

*to choose the economically *reasonable best* option for business process *reengineering* (for example, according to the criterion of minimum labor costs, according to the criterion of the *minimum total cost of ownership of the process*).

2) Information *about the numerical values* of the statistical characteristics of the distribution of the execution time of business processes provides a *number of additional opportunities* for *improving the efficiency of the functioning* of socio-economic processes and objects.

So, depending on the *size and shape* (right-handed or left-handed) of the asymmetry in the distribution of process execution time, both the labor intensity and intensity of the compared business processes can differ significantly; by comparing the data on the probabilities and time of completion of the list of planned works, you can:

*quantify the **level of tension** for the selected probability of performing labor processes (by structural units and performers),

*determine the **degree of workload** of *personnel* in different structural divisions,

*__justify__ the expediency of *redistributing work* among departments and, which is *also very important*, to establish the **number of employees more fairly**.

3) For the first time, the expediency of applying the process-statistical method of accounting for resource costs to *assess the intensity of labor is economically justified*. It is shown that the visualization of production and management processes using *IDEF*0 and/or *IDEF*3 models and *UML*- diagrams **provides**:

*visual representation of the *business process, *description of the concepts of the subject area, *automated synthesis of simulation models and reduction of financial and labor costs* for the implementation of procedures related to the assessment of the *complexity* of business processes and labor *intensity*.

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通货膨胀对内河船舶修理成本的影响分析
ANALYSIS OF THE IMPACT OF INFLATION ON THE COST OF REPAIRING RIVER VESSELS

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抽象的。文章介绍了材料等库存项目（二）价格变动对内河船舶修理成本影响的分析结果。主要成本和维修成本是使用作者开发的电子维修表确定的。

计算了维修工作成本的总变化，分析了主要组别 II 的价格变化及其对 2 艘不同技术和结构特征的船舶总维修成本的影响程度。

对对修船成本影响最大的材料等II类价格变动的影响进行分析。有人建议，可以通过使用渐进式船舶故障检测方法和维修方法来降低通货膨胀对维修成本的影响。

总之，得出了关于在电子维修表中进行计算时控制外部价格因素的可能性和权宜性的结论，以证明客户与维修承包商之间的车队维修合同金额的变化是合理的。

关键词：修船，船舶结构部分，修船材料，修船费用，修理清单，估计修理费用。

Abstract. The article presents the results of the analysis of the impact of changes in prices for materials and other inventory items (II) on the cost of repairing river vessels. The prime cost and the cost of repairs were determined using electronic repair sheets developed by the author.

The total change in the cost of repair work was calculated, an analysis was made of the change in prices for the main groups II and the degree of their influence on the total cost of repair of 2 vessels of different technical and structural characteristics.

The analysis of the impact of changes in prices for materials and other II, which have the greatest impact on the cost of ship repair, is carried out. It has been suggested that the impact of inflation on the cost of repairs can be reduced through the use of progressive methods of fault detection of ships and repair methods.

In conclusion, conclusions are drawn about the possibility and expediency of controlling the external price factor when performing calculations in electronic repair sheets in order to justify the change in the amounts of fleet repair contracts between the customer and the repair contractors.

Keywords: ship repair, structural section of the ship, ship repair materials, cost of ship repair, repair list, estimated cost of repair.

Inflationary processes due to political reasons have had an impact on all sectors of the economy, including the activities of ship repair enterprises.

The purpose of the study was to assess the impact of rising prices on materials (II) used in the repair of river vessels. When determining the cost and cost of repairs, the author used the developments made as part of the implementation of the research report on the development of the organization's standard [1]. In particular, the author of the article created unified forms of the repair list, other documents corresponding to the repair list, developed guidelines for filling out electronic forms of documents and performing calculations in them, and also created an example file for calculating the cost of repairs by compiling a repair list (in MS Excel) for the representative vessel. The creation of an electronic repair list was based on the study of the experience of the leading professors of the university Nikiforov V.G. [2,3] and Lazarev A.N., who were previously the developers of the Rules for the repair of ships of the river fleet [4].

The issues of automating the determination of the cost of production in shipbuilding and ship repair by compiling repair sheets were dealt with by such scientists as: Filko S.V. [5,7], Zykina S.V. [5], Malygin A.N. [6], Zyablov O.K., Funtikova E.V. [8].

Due to the fact that the electronic repair list is a convenient tool for accurately calculating the cost of repairing a vessel, the task was set: - to determine the extent to which the cost of repairing ships of the river fleet has changed due to inflationary processes that occurred in the period from October 2021 to May 2022.

Calculations and justifications were carried out for two projects of river vessels: t/c ex. 711B - self-propelled self-unloading cargo scow, t/c ex. 1577/5876 (1577/550A-LMPP) - river tanker of the "Volgoneft" type.

The composition of the repair work for the two ships under study was determined by groups of constructive breakdown (fig. 1). At the same time, the scope of work on the vessel pr. 711B was determined in an arbitrary order, in order to reflect the maximum possible range of repair work in the repair list. By t/c ex. 1577/5876 "Volgoneft-259", the composition and structure of the repair list were determined based on the actual materials of the fault detection of the ship's hull [9].

Figure 1. Generalized structure of the repair list by levels of constructive breakdown

Analysis of the overall structure of the cost of repair work on t/c 711B

In the process of compiling a repair list to calculate the cost of repairing a ship, complex databases [10] on the ships of this project, as well as information sources [11-13], were used.

Prices for II were obtained as a result of the analysis of a number of Internet sources, subject to wholesale deliveries for ship repair enterprises [14–21]. When calculating the cost of repairs, it was also assumed that the tariff rates for works remained unchanged. Norms of overhead (indirect costs) also remained unchanged.

The calculation showed that in the prices of October 2021, the cost of repairing the ship was 951,374 rubles, and in the prices of May 2022 it increased to 1,082,870 rubles. This ensured an overall growth rate of the cost of repairs in the amount of 113.9% (an increase of 13.9%).

Next, the structure of the cost of repairs was analyzed according to the structural sections of the vessel. The composition of structural sections for t/c 711B was adopted in accordance with the data [11]. As can be seen from the diagram in fig. 2, due to inflation, the cost structure has not changed significantly - at the level of a percentage or tenths of a percent. The most significant costs are associated with structural sections: "Wood and non-metallic materials in the body. Premises equipment" (30.7% - in May 2022 prices) and "Metal building and superstructure" (29.8% - for the same period).

Comparison of the growth rates of material costs for the structural sections of the vessel, caused by the increase in prices, showed that almost all groups of the structural breakdown of the vessel experience an increase in cost (fig. 3). As can be seen from the diagram, the structural section "Anti-corrosion protection"

showed the largest increase in the cost of repairs, despite the fact that in the overall structure of repair costs, this section accounts for 4.6% according to October 2021 and 6.7% according to May 2022. This is due to a record increase in prices for paints and varnishes and finishing materials.

Growth rates above the average for the entire vessel (13.9%) were shown by such constructive sections as "Metal Hull and Superstructure" and "Wood and Non-Metal Materials".

Repair cost structure for t/c ex. 711B for structural sections
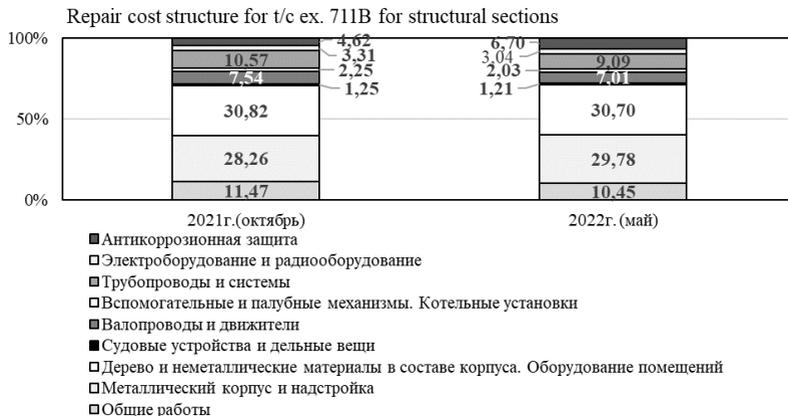
Figure 2. *Changing the cost structure of repairs t/c ex. 711B*

Growth rates of repair costs t / c ex.711B by design sections
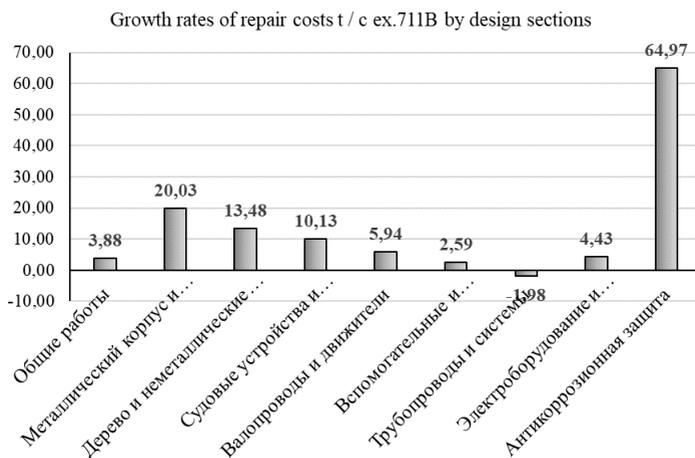
Figure 3. *The rate of increase in the cost of structural sections t / c ex.711B*

Analysis of changes in prices for materials and other inventory items

When repairing t./c. project 711B, 93 items of inventory items were used. In order to simplify the task, all IIs were combined into 20 enlarged groups. The total increase in the cost of ship repairs under the economic element "Material costs" amounted to 18.89%.

The results of calculating the growth rates of average prices for materials grouped into groups are shown in the diagrams fig.4-fig.6.

So, in the diagram in fig. 4 shows the increase in average prices for those II, the growth of which exceeds the average value of 18.89%. In fig.5. the growth rates of prices for II are given, the growth of which is below the average value. And, finally, in fig.6. material assets are presented that showed a decrease in average sales prices in 2022 compared to 2021. The largest increase in average prices is observed for raw wood needed for the manufacture of scaffolding. At the same time, treated wood showed a decrease. The rise in prices for raw wood is due to general inflationary trends. The export of raw wood from the Russian Federation was banned back in 2021 and, due to the growth in demand from processing enterprises, prices have increased. As for processed wood, its price after the introduction of a ban on the export of unprocessed wood increased (at the beginning of 2022), but by the end of May it decreased again, because with the introduction of sanctions on Russian goods and the ban on the entry of Russian ships into foreign ports, the export of processed timber to European countries has ceased. This led to the appearance of excess supply of this product in the domestic market and led to a decrease in prices. Thus, the difference in prices for processed wood and unprocessed wood has decreased.

II with above-average price growth rates (%)
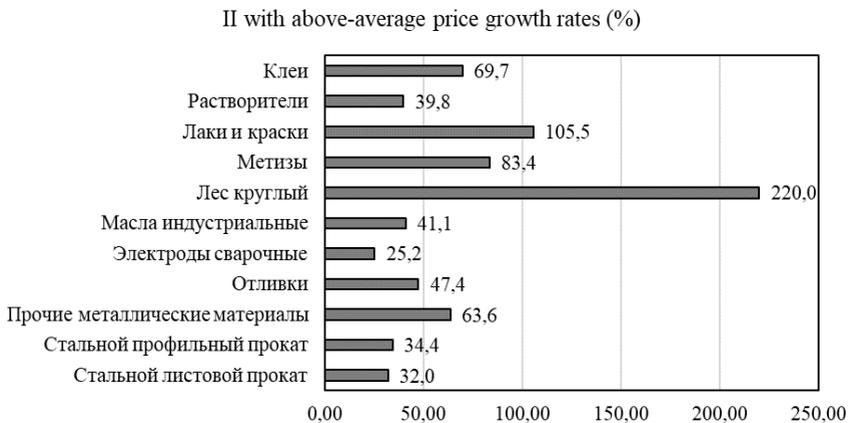
Figure 4. Material assets that showed the largest increase

Significant growth (40% or more) was shown by the products of chemical industries: "Varnishes and paints", "Solvents", "Adhesives" due to the large share of data export II, and the use of a number of foreign-made components in the production of these materials by Russian enterprises.

Sheet steel and profile steel are the main material used in the repair of ship hulls. Despite the fact that almost all rolled steel is domestically produced, this group II also shows a significant increase - more than 30%. Prices for other metallic materials (for example, copper and other light metals) rose even faster.

II with below-average price growth rates (%)

Прочие ТМЦ	8,9
Подшипники	15,5
Отделочней материалы (листовые)	18,2
Поковки	6,7
Листовой прокат оцинкованный	9,9
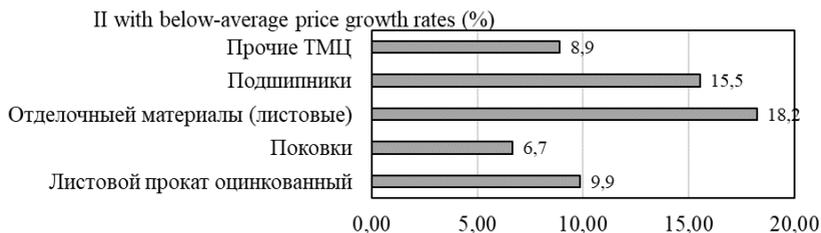
Figure 5. *Material assets that showed the smallest increase*

The growth in prices for sheet finishing materials (linoleum, chipboard, plastic, etc.) is at an average level due to the presence of a sufficient number of domestic producers).

A 15% increase in prices for bearings is mainly due to average global inflationary trends, as well as the need to change the logistics of supplies, since the supply of this product is carried out by domestic firms or China.

II, showing a decrease in average wholesale prices (%)

-6,18
-3,05
-13,09
-18,44

☐ Кабель; электроиз.материалы ☐ Трубопроводная арматура
☐ Доска (обрезная и необрезная) ■ Трубы

Figure 6. *Tangible assets that have shown a decrease in value*

It should be noted tangible assets, the cost of which on average decreased in May 2022 compared to October 2021. These are: cable and electrical insulating

materials (mainly made in China), pipes and pipeline fittings (domestic analogues are used without loss of quality).

Analysis of the general structure of repair costs for t/c "Volgoneft-259"

By calculating the repair list, the cost of repair work was obtained: - 1,776,369 rubles in October 2021 prices and 1,926,654 rubles in May 2022 prices. The overall growth rate of the cost of repair work amounted to 108.5% (an increase of 8.5%).

The main part of the repair work consists of work on measuring residual thicknesses and determining the parameters of other hull defects, presented in the "General work" section and work on replacing part of the hull structures: section "Metal hull and superstructure". A large proportion of the "General Works" section can be explained by the fact that, in accordance with the requirements of the Russian River Register, a detailed flaw detection must be carried out on the ship's hull. Given that the Volgoneft-type motor ships are quite large, the number of measurements is significant.

The volume of replacement of hull structures is small. This is explained by the fact that most of the "Volgoneft"-type motor ships were modernized in the period from 2014 to 2020. Thus, t/c Volgoneft-259 was upgraded in 2014 under project 1577/550A-LMPP. During the renovation of the vessel, a significant part of the hull structures in the cargo area was replaced with high-strength steel.

An analysis of the general structure of the cost of repair work showed that the share of the structural section "Metal hull and superstructure" increased by 1.5% due to inflation. At the same time, the share of "General Works" decreased.

The highest growth rates of repair costs in 2022 compared to 2021 were shown by such structural sections as: - "Anti-corrosion protection", "Metal hull and superstructure", "Wood and non-metallic elements in the hull. Room equipment".

Conclusions:

The study performed, *firstly*, showed that:

— electronic repair list is a convenient tool for costing and determining the cost of repairs;

— electronic repair list easily adapts to the specifics of the vessel design;

— allows you to analyze the impact of changes in prices for materials and other II, which allows the repair contractor to justify the cost of the contract for the repair of the ship when agreeing on the amount and volume with the customer.
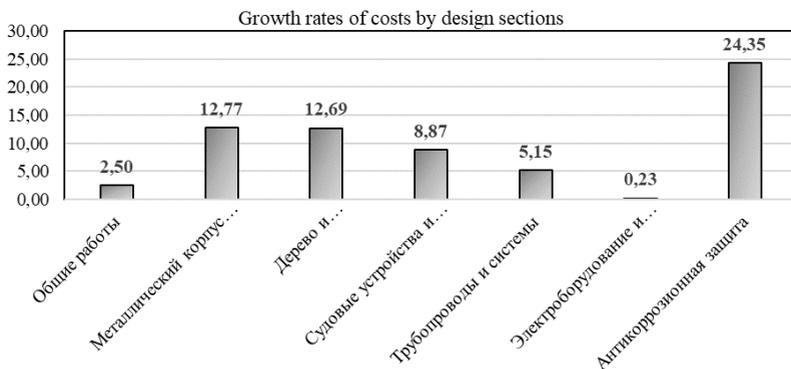
Figure 7. *The rate of increase in the cost of structural sections t / c ex.711B*

Secondly, According to the general effect of inflation on the cost of repairs, it can be concluded that in the current economic situation, the overall growth rate of the cost of repairs is (equally) influenced by both the inflation factor and the structure of the cost of repairs by design sections. The approach to hull inspection and ship repair method also have a significant impact. So, in particular, for t/c "Volgoneft", the cost of repairs is significantly increased: - the need for detailed fault detection, which is not advisable [22], as well as laborious detailed replacement (by sections).

The higher the share of the so-called "industrial" (more efficient and economical) repair methods in the total amount of repair costs, the lower the impact of inflation on the cost and cost of repair work.

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上合组织在现代国际经济和科学关系体系中的地位
SCO IN THE SYSTEM OF MODERN INTERNATIONAL ECONOMIC AND SCIENTIFIC RELATIONS[1]

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抽象的。世界经济和国际经济关系中发生的现代过程具有复杂性和不确定性。这在很大程度上是由于当前世界面临着国际经济关系体系的变化，地缘政治因素和数字化带来的运输、物流和价值链的转变。本文的主要目的是确定上海合作组织在国际经济关系体系中的作用，以及分析该组织成员国之间研究联系的扩展。研究得出的结论是，上合组织框架内的互动在现代地缘政治现实中尤为重要；显示了参与国对实施有助于该区域平衡经济增长、社会和文化发展的多边研究项目的兴趣。
关键词：科技合作、上合组织、联合倡议、社会经济增长。

Abstract. *Modern processes taking place in the world economy and international economic relations are characterized by complexity and uncertainty. This is largely due to the fact that at present the world is faced with changes in the system of international economic relations, the transformation of transport, logistics and value chains caused by the geopolitical factor and digitalization. The main purpose of this article is to determine the role of the Shanghai Cooperation Organization in the system of international economic relations, as well as to analyze the expansion of research ties between the member states of the organization. The study resulted in conclusions that interaction within the framework of the SCO is especially important in modern geopolitical realities; the interest of the participating countries in the implementation of multilateral research projects that will contribute to balanced economic growth, social and cultural development in the region is shown.*

Keywords: *cooperation in science and technology, SCO, joint initiatives, socio-economic growth.*

Global challenges (pandemic crisis; post-pandemic recovery of the world economy; rapid development of digital technologies accelerated by the effects of COVID-19; new threats and risks caused by anti-Russian sanctions and Russia's military special operation in Ukraine, etc.) pose difficult challenges for states, international and integration organizations tasks that can be solved only by collective efforts, including by developing multilateral cooperation. In this regard, the study of the role of the Shanghai Cooperation Organization (SCO) in the system of modern international economic and scientific relations may become an important direction in research.

Based on the analysis, the possibilities of deepening cooperation in the areas of science and technology of interest to the participating countries in the SCO space through the development of the digital economy and the use of scientific and technological achievements were identified and justified. At the same time, the use of synthesis helped to identify key points and the sequence of ongoing changes and additions, and generalizations helped to formulate sound conclusions.

It should be noted that since its inception (2001), the SCO has become a significant actor in international economic relations, both from an economic and political point of view. First of all, due to the significant territorial and economic potential. Thus, the total territory (more than 34 million km²) of the countries included in the organization is 60% of the territory of all of Eurasia; the total population of the SCO countries as of 04.08.2022 is approximately 3,322 million people, that is, it approaches half of the world's population (fig. 1).
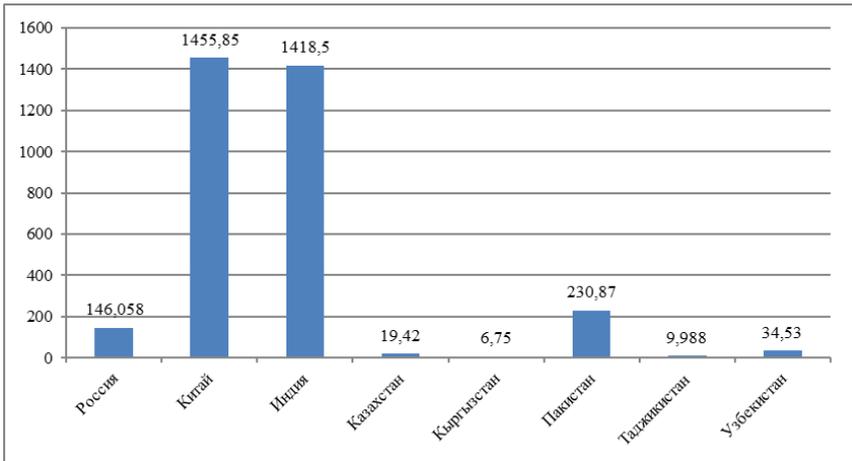
Figure 1. Population of the SCO countries as of August 2022, million people
Source: compiled from: [3]

According to the SCO Secretariat, the total size of the economies of the SCO member states is about $20 trillion, positioning itself as one of the largest consumer markets in the world. To date, the total volume of GDP has reached about ¼ of the global indicator (29.97%). According to forecasts, by 2030 this figure may increase to 35-40% [6].

In addition to significant human capital, the region has huge reserves of raw materials, which is confirmed by official data. For example, in the statistical report of the Organization of the Petroleum Exporting Countries (OPEC) for 2022 [8], it is noted that the oil reserves of the SCO countries amount to 619 billion barrels, which is equal to 40% of all proven reserves of this resource on Earth. The export of crude oil and oil products of this group of countries is practically comparable to the export of oil by the OPEC countries (29.1% and 33.2% of world exports, respectively). In addition, the SCO is ahead of OPEC in terms of oil production (43.9% and 37.1%, respectively). The oil refining capacity of the SCO member countries (34.6%) is almost three times higher than the capacity of such industries in the OPEC countries (12.1%), i.e. more than 1/3 of the world's oil refineries are concentrated in the countries of the Shanghai Cooperation Organization. An equally important resource is natural gas, half of which is also concentrated in the SCO countries (50.1%). It should also be noted that 35.1% of the world's gas reserves or 1.39 trillion m^3 are produced in the SCO space; the share of these countries in the world export of natural gas is 20.9% (259.7 billion m^3) [8].

The SCO countries occupy leading positions in the world food markets. For example, according to the Food and Agriculture Organization of the United Nations (FAO) [9], in 2020 they produced 4.24 billion tons of crop and livestock products (about 38% of the world production of this type of product) (the world indicator in this period was 11.19 billion tons). In particular, the SCO accounts for 53.5% of world rice production, 31.6% for meat, 51.2% for wheat, 29.2% for sugar, sugar beet and cane, 27.0% for corn, 10.0% - soybeans. A significant share of food production is exported. For example, the share of the SCO countries in world sugar exports in 2020 was 12.5%; rice - 42.9%; wheat - 21.9% [1, 9]. Based on the available data, it should be noted that the SCO member countries are implementing measures aimed at ensuring food security. This is confirmed by the development of the "Concept of interaction between the SCO member states in the field of "smart" agriculture and the introduction of agro-innovations" and measures aimed at reducing poverty in the region. Thus, on July 25, 2022, the VII Meeting of the Ministers of Agriculture of the SCO Member States was held, where proposals were considered aimed at activating "points of growth" and unlocking the potential in the field of agriculture. In particular, the Minister of Investments and Foreign Trade of the Republic of Uzbekistan Zh. Khodzhaev emphasized that it is necessary to introduce "high-tech technologies and innovations, digitalization,

exchange of accumulated experience and knowledge, and provide comprehensive support for the development of household plots and horticulture". An important place in the joint work is given to the training of qualified personnel. As noted during the meeting, the development of agro-ecological agriculture can become a priority for all countries in the region. In this regard, it is very important to carry out close interaction between higher educational institutions specializing in agriculture. That is, partnerships should be developed in the field of technology, mutual investment in research and development (R&D), personnel training and the creation of the necessary infrastructure [4, 5].

All taken together contributes to the expansion of economic, scientific and technical cooperation between the SCO member states. On the desire of the participating countries to strengthen cooperation in trade, production, transport, energy, financial, investment, agricultural, customs, telecommunications, scientific, cultural, humanitarian and innovation spheres, may indicate the discussion of priority areas for the development of science, technology and innovation in the SCO space and the approval of relevant documents. Thus, at the Sixth Meeting of the Heads of Ministries and Departments of Science and Technology of the SCO Member States (April 8, 2022, Tashkent), the heads of delegations approved the "Action Plan for Scientific and Technical Cooperation in Priority Areas for 2022–2025" and the "Cooperation Program for the Development of Artificial Intelligence", and also approved the mechanism for the implementation of joint multilateral research and innovation projects within the framework of the SCO [7]. The implementation of the main provisions set out in these documents will make it possible to introduce new innovative and technological developments in priority sectors of national economies and promote multilateral cooperation between countries.

Interaction in the SCO space is especially important in modern realities, including in the period of post-pandemic recovery and a difficult geopolitical situation, and it is technologies and innovations that can be one of the main drivers for overcoming crisis situations with the least losses. In this matter, it should be noted that the SCO countries have a great potential for the development of technologies and innovations. For example, China is not only the largest economy in the organization, but also the most active supporter of economic cooperation in the SCO space. Currently, China is pursuing an active policy to develop the Belt and Road project and new areas of cooperation (digital economy, green energy, low-carbon projects, artificial intelligence, information communications, modern agriculture, cross-border e-commerce, etc.), and as well as liberalization and facilitation of trade and investment procedures. As experts note, in an effort to optimize the structure of trade with the SCO member states, China stimulates the entry of more goods from these countries into the Chinese market. Indeed, there are more and more goods from the SCO countries on the Chinese market, especially agricultural

products from Russia and the countries of Central Asia [2]. It should also be noted that there is a huge potential for the development of technology and innovation in India. The country ranks third in terms of the number of publications in prestigious international scientific journals and is among the top 50 innovative economies in the world. Currently, one of the priority areas is the development and implementation of projects in the field of ecology and renewable energy sources [6].

The fact that the member countries of the organization are interested in cooperation is also evidenced by the volume of mutual trade. So, for example, in 2021, the trade turnover between the SCO member states (including Iran[2]) exceeded 651 billion US dollars [10], which is 10.25% of the total foreign trade turnover of the SCO countries. It should be noted the special status of Russia, which continues to be an important trading partner for all SCO member states. The intensification of trade cooperation was largely influenced by a number of factors (both political and economic). However, one can agree with the opinions of experts that the transit potential has been actively developing within the framework of the SCO recently. This is largely due to the development of a coordinated transport management system in the region, "the creation of effective economic transport corridors, the formation of an integrated transport management system", etc. [6]

At present, the SCO member states still face many unresolved tasks. There is a lot of work to be done to ensure coordinated R&D activities, expand ties with the scientific and public communities, and encourage exchanges of views between scientists and experts in the fields of politics, security, economics, ecology, new technologies, humanitarian and other fields. Given the emerging expansion of the SCO, it can be assumed that the organization can become a multilateral platform for the joint development and implementation of mutually beneficial initiatives in various areas, up to the green economy and digital transformation.

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2 The decision to start the procedure for his admission to the organization was made at a meeting of the SCO CHS in Dushanbe in September 2021, and in September 2022 it is expected to sign a Memorandum of Commitment in order to obtain the status of a SCO member state

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俄罗斯轧管企业经济安全的外部威胁及其负面影响
EXTERNAL THREATS AND THEIR NEGATIVE CONSEQUENCES FOR THE ECONOMIC SECURITY OF RUSSIAN PIPE-ROLLING ENTERPRISES

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抽象的。 以国民经济的基础部门之一——轧管业为例，揭示了当前关于新兴的 COVID-19 大流行对俄罗斯经济领域发展的影响的热点问题．在 COVID-19 大流行造成的制裁和封锁的背景下，对管道行业发展的外部威胁进行了分析，并确定了它们在公开市场上对该行业的负面影响． 概述了国家和企业的一些优先任务，这些任务需要紧急战略决策来克服对管道行业和俄罗斯经济安全的负面危机后果。
关键词：经济安全、管道公司、封锁、制裁、COVID-19

Abstract. *The topical issue of the present time about the consequences of the impact of the emerging COVID-19 pandemic on the development of the economic sphere in Russia is revealed, using the example of one of the basic sectors of the national economy - the pipe rolling industry. An analysis was made of external threats to the development of the pipe industry in the context of sanctions and lockdowns caused by the COVID-19 pandemic, and their negative consequences for the industry in an open market were identified. A number of priority tasks for the state and business are outlined, which require urgent strategic decisions to overcome the negative crisis consequences for the pipe industry and the economic security of Russia.*

Keywords: *economic security, pipe companies, lockdowns, sanctions, COVID-19*

Introduction

In the conditions when the Russian Federation is helping the sane part of Ukraine to end the bloody eight-year civil war, carrying out the tasks of its demilitarization and denazification, the authorities of the satellite countries of the United States are destroying the European economy, blindly trusting the security guarantees that the United States promises them, while trying to inflict maximum harm to our state. The consequences of a short-sighted European policy are already in sight, and 2022 may enter Western historical dictionaries as a sobering year. Back in 1948, the English philosopher and historian Arnold Joseph Toynbee wrote: "The West is the arch-aggressor of the modern era. He occupied Russia in 1610, 1709, 1812, 1915, 1941, sold Africans into slavery, destroyed the indigenous population of North America in order to clear a place for Western European uninvited guests and their African slaves. Fear of Russia and China is proof that the West is not used to suffering at the hands of the rest of the world the way the rest of the world has suffered at the hands of the West." [1, p. 252]. Previously, Russia adhered to a policy of strategic minimalism, that is, until the end of 2021, it responded to threats to economic security asymmetrically, after the fact, and only in the absence of another way out. Many in the West took this approach as a manifestation of weakness - "Russians will endure everything". But on February 24, 2022, Russia showed that it can be just as maximalist in its demands for security guarantees and launched a preemptive strike in time.

The logistical chaos that began as a result of the COVID-19 lockdowns is now becoming more and more horrifying as a result of numerous sanctions.

Economic security of the state in modern conditions

The economic security of the state is characterized by the possibility of its constant economic development, maintaining its self-sufficiency in any crisis situations, including the military situation, accompanied by challenges, risks and threats due to the constantly changing world and domestic market conditions.

Properly balanced indicators of the volume and structure of domestic production allow the state to maintain its self-sufficiency in the stochastic system "export-import".

The preservation of national interests and economic security force the state to solve the problems of identifying threats, identifying risks and their consequences in the constant dynamics of modernity. Moreover, these decisions should be directly related to backbone industries and businesses for their innovative development, while minimizing economic losses.

The State Strategy for the Economic Security of the Russian Federation [2], developed to address such key issues, determines the strategy of the state on the world stage: identifying existing and potential threats and, as a result, developing countermeasures to clearly develop and develop competitive advantages.

Today, the Russian economy is facing new long-term systemic challenges, internal and external threats in the economic sphere, reflecting both global trends and internal development barriers.

A significant change in economic conditions on the market is a consequence of the "Special Operation" of the Russian Federation in Ukraine. Many companies have become unable to enforce transactions, both internationally and domestically.

The first challenge is the intensification of global competition, accompanied by an increase in geopolitical rivalry, including for control over raw materials and energy resources. This competition extends both to traditional markets for goods, capital, technology and labor, as well as to systems of national governance, support for innovation and human development. It should be noted that for Russia the transformation of the world economy creates new opportunities for the development of foreign economic integration, strengthening and expanding positions in world markets, importing technology and capital.

The second challenge is the expected new wave of technological change, which will increase the role of innovation in socioeconomic development and reduce the impact of many traditional growth factors. That is, the transition of the world economy to a high-tech way of life, which leads to an increase in the role of human capital as the main factor in economic development and state security.

The third challenge is the possibility of negative trends in the development of human potential associated with a reduction in employment in the sectors of the economy, a decrease in the quality of training of qualified specialists in relation to European countries, the lack of mechanisms for enterprises to be interested in training workers for specific industries, filling the labor market with cheap labor force from neighboring countries, which leads to a significant lag in the application of innovative production methods, as well as a decrease in the availability of high-tech medical services for the general population.

In connection with the transition of the world economy to alternative forms of energy, which is lobbied by the Western idea of "zero carbon dependence" which has not been economically calculated, a fourth challenge arises related to the need to invest large material resources in the modernization of existing and the construction of new enterprises with modern efficient technologies.

But the main challenge of today is the historical all-encompassing Russophobia of the Western world.

The financial, economic and socio-political situation in Russia is subject to the negative influence of the policies of the US and the EU, the main thread of which is the artificial creation of crisis phenomena aimed at undermining the fundamental principles in ensuring the national security of the Russian Federation. The Energy Security Doctrine of the Russian Federation [3] characterizes emerging challenges and threats and develops measures to counter these processes.

Economic security of the pipe industry

The pipe-rolling industry of the Russian Federation is included in the structure of its industrial complex as one of the strategically important ones, influencing the sustainable financial and economic development of the entire state. Therefore, ensuring the economic sustainability of the development of these enterprises depends on the introduction of high-tech production methods and modern economic management technologies that need to be developed directly in our country, which is once again confirmed by sanctions from the West on the ban on the export of innovative technologies [4].

Issues related to the economic security of the sustainable development of individual enterprises and entire industries are set out in the scientific works of many Russian and foreign experts in the field of economics: T.N. Agapova [5], V.I. Barylenko [6], S.Yu. Glazyev [7], [8], O.V. Efimova [9], N.N. Makarova [10], M. Porter [11], A.E. Suglobov [12], [13], A.D. Sheremet [14], J. Schumpeter [15] and others.

Despite a wide range of issues resolved in the framework of the studies published in these papers, the problem of identifying the main external economic threats and their consequences for the pipe industry has not received significant development. The result presented in this article is the interpolation of the main threats to the economic security of the state and pipe production, as a result of which the main negative consequences for the industry were identified, which require prompt regulation and consistent strategic neutralization.

Let us illustrate with a diagram the volumes of the market for pipe products, calculated as the total revenue of companies for the tax period based on the official statistics of Rosstat, the workload of production capacities according to the annual reports of large pipe-rolling enterprises and inflation of the ruble.
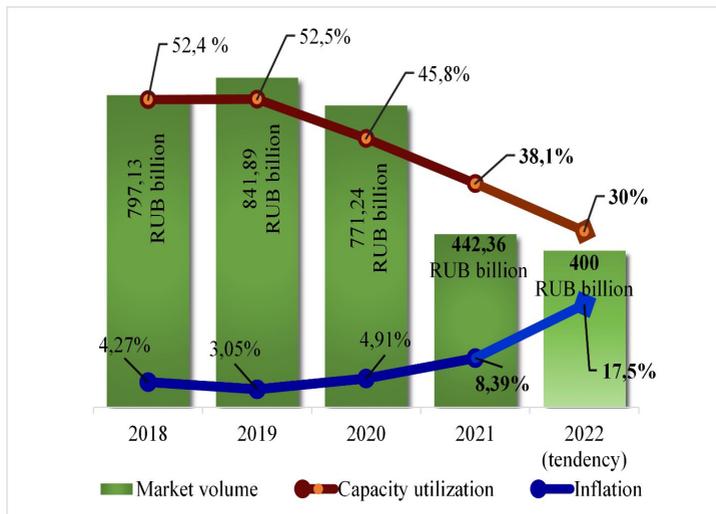
Figure 1. Dynamics of changes in the volume of the market of the pipe-rolling industry of the Russian Federation for 2018-2022. Source: compiled by the author according to Rosstat [16], StatBuro [17], official websites of pipe rolling enterprises (annual reporting)

In 2021 and forecasts for 2022, there is a sharp drop in the volume of the pipe products market amid increased ruble inflation and a sharp decrease in production capacity utilization. There is an urgent need to analyze the impact of external threats on the economic security of Russian pipe-rolling enterprises.

Research results

To build an effective system of foreign economic security of pipe rolling enterprises, it is necessary to identify the most dangerous external threats that need operational regulation or consistent strategic neutralization (*Table* 1).

Table 1

External economic threats and consequences for pipe rolling companies

Threat	Consequence
Negative changes in the structure of foreign trade associated with the sanctions regime and lockdowns from a new wave of the COVID-19 pandemic.	Destruction of foreign economic partnerships between countries exporting pipe products. There is nothing to replace the break in the external supply chain in the domestic market.

Decrease in prices and consumption of energy resources in the world market depending on the political situation	A decrease in the flow of investments in the pipe-rolling industry, which negatively affects the financial activities of enterprises and, as a result, losses in tax deductions to the budget funds of the Russian Federation.
Increasing the dynamics of the movement of factors of production abroad	«Flight» of capital to more developed economies. Loss of funds due to the seizure of key assets, as a result of political decisions.
Protectionist policy of the states of the Anglo-Saxon world	Unfair competition, expressed in the inability to sell pipe products in countries with protectionist policies.
Negative impact of international economic organizations and transnational companies	The conquest of the domestic market by foreign firms and, as a result, the growing dependence of the industry on imports (equipment, technology, etc.). Elimination of pipe-rolling enterprises (bankruptcy) in favor of competitors abroad. Leaving the domestic market of foreign companies under the pressure of political sanctions.
Monetary and financial relations and speculative games in the stock markets	Increase in industry budget expenditures for its maintenance. Decline in the value of shares of enterprises, leading to their bankruptcy.

Source: Compiled by the author.

Thus, the primary destructive consequences for the pipe-rolling industry from the most dangerous external threats are indicated (*tab*. 1), which require urgent measures to neutralize them with a common interest from both business and the state.

Conclusion

The article attempts to identify the main external economic threats and their consequences for the pipe industry in a free market. The priority tasks are outlined, requiring urgent decisions on the part of the state and business to ensure the economic security of one of the backbone industries and the state as a whole.

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现代条件下俄罗斯管道工业有效发展和经济安全的机遇
OPPORTUNITIES FOR EFFECTIVE DEVELOPMENT AND ECONOMIC SECURITY OF THE RUSSIAN PIPE INDUSTRY IN MODERN CONDITIONS

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抽象的。本文考虑了主要的外部威胁及其对俄罗斯联邦轧管企业经济安全的影响，这些企业需要运营监管和持续的战略中和。审查俄罗斯联邦确保经济安全的立法框架，旨在组织国家应对外部挑战、威胁和风险的工作，并制定一系列与俄罗斯经济安全直接相关的措施建议管业。在 COVID-19 大流行的制裁和封锁的背景下，石油、天然气和管道行业之间有效互动的重要性，每个行业的定性发展，及时的战略指导方针的定义和国家的支持，被揭露。考虑了克服对管道行业和俄罗斯经济安全的负面危机后果的可能方法。

关键词：经济安全、管道公司、封锁、制裁、COVID-19。

Abstract. *The article considers the main external threats and their consequences for the economic security of the pipe-rolling enterprises of the Russian Federation, which are in need of operational regulation and consistent strategic neutralization. A review of the legislative framework of the Russian Federation for ensuring economic security, aimed at organizing the work of the state to counter external challenges, threats and risks, is made, and a set of measures that are directly related to the economic security of the pipe industry is proposed. The importance of effective interaction between the oil and gas and pipe industries in the context of sanctions and lockdowns of the COVID-19 pandemic, the qualitative development of each of them, with the definition of timely strategic guidelines and the provision of support from the state, is revealed. Possible ways of overcoming the negative crisis consequences for the pipe industry and the economic security of Russia are considered.*

Keywords: economic security, pipe companies, lockdowns, sanctions, COVID-19.

Introduction

The Russian pipe-rolling industry is an exporter of its products to more than 80 countries of the world [1]. In 2018, Russian pipe-rolling enterprises supplied 2.5 million tons of steel pipes abroad. In 2019, exports decreased by 15.3% and amounted to only 2.1 million tons of products. According to statistics, 2020 was characterized by an even greater drop in exports, already by more than 26% compared to 2019, which amounted to only 1.5 million tons. The rate of decline in sales has decreased and in 2021 by more than 27% compared to 2020 [2], [3]. A significant decrease in exports of pipe products is expected in 2022, associated with the announcement of an embargo by Western countries. All this is the result of severe economic sanctions and the negative impact of lockdowns.

For the successful economic development of the Russian pipe-rolling industry and the neutralization of negative changes in the structure of its foreign trade, only joint, mutually beneficial actions of the state and business can achieve a policy of effective regulation and strategic planning in the global market for pipe products.

And, if sanctions are a practically unpredictable, uncontrollable process that "hit the sick" (dependence on imported equipment, technologies, etc.), which can only be combated by counter-sanctions and an emphasis on import substitution of high-tech pipe-rolling industries, the consequences of the COVID-19 pandemic, accompanied by numerous lockdowns, have almost already led to a global crisis. In one of his speeches, Marriott International CEO Arne Sorenson said that today's global economic situation, caused by the coronovirus pandemic, is causing more financial damage than after the September 11, 2001 attacks and during the 2008-2009 crisis combined [2], [3]. Therefore, this situation requires urgent action:

- Tough mobilization measures, including: the growth of scientific medical research and the creation of innovative technologies for early diagnosis, treatment of COVID-19 and its consequences, the cost of improving the quality and accessibility of medical care for the population, equipping treatment centers with modern equipment, providing the necessary, high-quality pharmaceuticals, the training of qualified medical professionals who are guaranteed the highest level of safe work.
- Continuous work and exchange of scientific achievements with international organizations related to research in the field of preventing the spread of the pandemic and treating coronovirus infection.
- Monitoring the epidemiological situation of countries with biolaboratories of the US armed forces located on their territories and / or with a high level of infection with various strains of coronavirus.

Impact of price volatility, global energy consumption and political environment on the pipe industry

The decline in the consumption of steel pipes in the world market is also due to restrictions on the OPEC + deal, where the ministers of the participating countries came to an agreement to minimize oil production until December 31, 2022 [4]. The volatility of energy prices, and, accordingly, the export of Russian pipe products was also negatively affected by numerous lockdowns from another stronger wave of the COVID-19 pandemic. The countries of the EU and the former socialist camp, inspired by the ideas promoted by the so-called "Green Movement", are trying to switch to renewable energy (wind and solar), forgetting that the manufacture of equipment for its accumulation and further use requires serious energy-intensive production, which in turn increases the cost of the energy received. And also the political creed of the United States is intimidation by dependence on cheap oil and gas supplies from Russia and lobbying for the supply of its own expensive liquefied gas. Against the backdrop of all these events, our state needs to reorient itself towards the internal development of the fuel and energy pipeline network, the construction of new plants with deep processing of raw materials, which guarantee high added value [5]. This idea is confirmed by today's decision of the European Union to refuse the use of Russian energy resources in the near future.

Foreign investors in the construction and reconstruction of Russian oil refineries (OR) before the start of the special operation in Ukraine were the largest foreign companies. But with all the positive aspects of such an investment, there is one most vulnerable for our state and, accordingly, suppliers of pipe products, a place - under the influence of unprecedented sanctions, many of these companies, succumbing to political pressure, despite huge financial losses, curtail their activities in our country.

It is also necessary to remember that the economy is directly dependent on politics, and by placing fixed assets in the form of OR abroad (for example, OR in Serbia), we risk losing our long-term investments in the event of political volatility of the elites, as was the case with the South Stream pipeline to Bulgaria. Therefore, it is necessary to solve at all levels, from business representatives to government leaders, the main task - moving away from the export of raw materials to a high-tech, competitive economy. An example of this strategy can be considered the construction and launch at full capacity in 2020 of the ZapSibNeftekhim petrochemical complex, the raw materials for which come from the northern gas processing plants through a single product pipeline [3].

Consequences of the "outflow" of capital and the movement of factors of production abroad

One of the ways to withdraw capital abroad is the creation of transnational corporations (TNCs), which have the opportunity, through investments in produc-

tion, to underestimate the prices of raw materials and semi-finished products sent to subsidiaries abroad and, conversely, to overestimate them for components and equipment supplied to our country [6].

Consider, for example, TNK PJSC Pipe Metallurgical Company (TMK). For the period of 2018, it included 3 divisions [7]: American - with a revenue of 1349 million dollars and a number of employees of 2000 people; European - with revenue of 308 million dollars and the number of employees also 2000 people; Russian - with revenue of 3442 million dollars and the number of employees of 38000 people [3].

With a simple calculation of productivity per employee (*fig*. 1), we get: in the American division - $ 670 thousand; in the European division - $150,000; in the Russian division - $ 90 thousand.

The "Chelyabinsk Pipe Rolling Plan" (CPRP) PJSC group worked according to the same scheme, the enterprises of which are located both in Russia and in the Czech Republic, and in the United Arab Emirates [8], [9, p. 53].

As a result of a change in the political situation in early 2020, PJSC TMK sold the American division at a loss, which once again proves the dependence of the economy on politics [10], [11]. And the enterprises of the PJSC CPRP group became part of PJSC TMK in 2021.

At the end of 2021, PJSC TMK came out with the following results (*fig*. 1): European - with revenue of $434.27 million and also 2,000 employees [12]; Russian - with a revenue of 4547.78 million dollars and the number of employees 42160 people [13, p.42].

The graphs (*fig*. 1) illustrate that the situation in terms of productivity per person does not change from year to year across divisions: it is much higher abroad. At the same time, as in general in the entire pipe-rolling industry of the Russian Federation, at the enterprises of PJSC TMK there is a decrease in such an indicator of the performance of each employee as wages in dollar terms, with a slight increase in ruble terms (*fig*. 2.3).
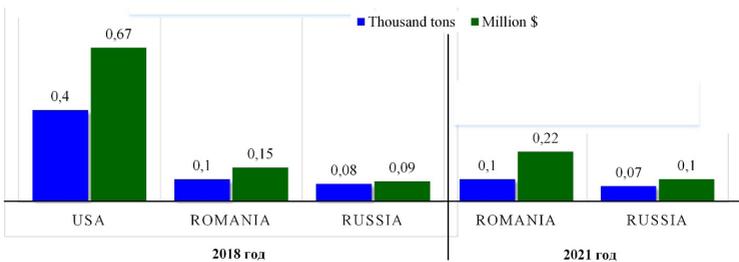
Figure 1. *Summarized chart of productivity per person in the TMK divisions for the period of 2018 and, merged with CPRP, for the period of 2021 (without the sold American division)*

Source: Compiled by the author

But at the same time, it is necessary to take into account inflation in the country, which, according to official data, reached 8.26% by the end of December 2021 (with a target value of about 4%). Today, the Central Bank of the Russian Federation has significantly raised its inflation forecast in Russia for the whole of 2022 to 18-23%. As of July, it is 17.6% with a constant wage in the Russian division.

Figure 2. Dynamics of average wages across «TMK» Group enterprises (% of the previous year without the American division)
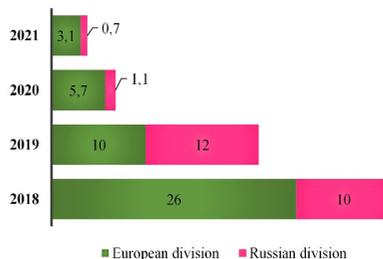
Figure 3. Growth dynamics of average wages across "TMK" Group enterprises in national currency (% to the previous year)

Source: compiled by the author according to [14], [15]

Another way to withdraw capital abroad and, accordingly, avoid paying taxes is offshore. With the help of simplified taxation in offshore zones and many one-day firms (laying), the possibility of withdrawing capital abroad increases many times over. Unscrupulous businessmen take advantage of this, justifying their actions by the absence of bureaucracy, all kinds of restrictions in doing business, justifying their actions by the fact that this has a beneficial effect on the business as a whole. Thus, PJSC TMK and its constituent enterprises PJSC CPRP have offshore companies in Cyprus [7], [9], [14 p. 62, 116-117]. To combat the negative manifestations of the financial activities of enterprises, Federal Law No. 376-FZ "On Amendments to Parts One and Two of the Tax Code of the Russian Federation (with regard to taxation of profits of controlled foreign companies and income of foreign organizations)" was adopted (as amended by Federal Laws dated November 12, 2018 N 412-FZ) [16].

The dependence of the foreign economic security of the pipe industry on the protectionist policy of states

Starting from the 90s of the last century, capitalism emerging in our country began to act according to European and American rules, creating structures with cross-border capital, competing in international markets with long-established

international corporations, thereby forcing the Anglo-Saxon countries to apply anti-dumping measures in their markets, which, of course, contradict the basis of capitalism - healthy competition. Thus, the decision of the US Department of Commerce at the request of the French pipe manufacturer Vallourec - Vallourec Star (headquartered in Houston, Texas) about the "unfair" competition of "Volzhsky Pipe Plant" JSC (Volzhsky city, Volgograd Oblast, Russian Federation) supplier of pipe products for In the United States, which is part of PJSC TMK, import duties of 210% were introduced, which, naturally, knocked our company out of the American market.

Despite Russia's membership in the WTO, Western countries, trying to slow down or stop the development of the economy of our country, under various, mostly political, pretexts impose sanctions on our enterprises, forcing them to leave certain markets.

So, unable to withstand unfair competition, PJSC TMK left the American market, which sold its subsidiaries IPSCO Tubulars to the Italian company Tenaris. The same thing happened with PJSC "Severstal" (Public Joint Stock Company "Severstal"- is a Russian vertically integrated steel and mining company that owns dozens of enterprises located both in Russia and abroad.) and PJSC "Mechel" (Public Joint Stock Company "Mechel" - is the largest mining and metallurgical company in Russia, headquartered in Moscow, Russian Federation).

Recent political events in the world show that, despite the change of Administrations in the United States, the attitude towards Russia and its business will always be negative, with the use of double standards and discrimination at all levels of political and economic reality.

As the practice of the world economy has shown, the creation of transnational companies, with the help of which it is possible to evade protectionism and unfair competition, did not live up to expectations. As a result, the political conjuncture of the world market outweighs the economic expediency. So on March 2, 2022, the EU introduced a sanctions list for the import of a wide range of Russian steel products, which included welded and seamless pipes of various diameters. European divisions are experiencing huge difficulties caused by the blocking of accounts. And new projects in the Middle East and the expansion of gas pipelines to China, which can partially compensate for the loss of other markets, can be expected no earlier than 2023-2024.

The influence of transnational companies on the country's economy and the foreign economic security of pipe-rolling enterprises

The Russian economy, like the economies of almost all states, is under a serious threat of the negative impact of international economic organizations and transnational companies.

Thus, a vivid demonstration of the negative impact of TNK is the activity of the largest representatives of the Russian pipe industry, such as "Severstal" PJSC,

"Mechel" PJSC, EVRAZ Company (EVRAZ), NLMK Company (NLMK), PJSC TMK, which, having conquered the domestic market, have the main production assets abroad. Their development leads to the bankruptcy of enterprises that are still operating independently or even enterprises that are part of TNCs, but on the territory of Russia. Thus, their functioning, with insufficient legislative state control, can only be transformed into self-enrichment, causing damage to the country's economy.

The sanctions war of the West has revealed today a whole layer of problems in the pipe industry of the Russian Federation. So many managers, both enterprises and government agencies, do not understand or do not support the need to move to new methods of production management (mobilization economy, strategic state planning carried out jointly with business, etc.). After the introduction of personal sanctions, many heads of the largest companies left all assets and resigned from their duties as public leaders. [17]. This suggests that it is urgent to move to a company management model where oligarchs work for the state, and not vice versa. That is, Russia needs a powerful initiating impulse (collapsed financial sanctions of the States and their satellites) in the forced formation of a new technological order and the formation of institutions of a new world economic order. But first, the cleansing of the state administration system from the irresponsibility of officials and the criminalization of a number of the most important institutions for its regulation. What is happening now with the help of "natural filtration".

Thus, the rapid development of transnational companies in our country, many of which no longer hide their legal and state nihilism, simply obliges our Russian politicians, economists and lawyers to oppose this phenomenon with such decisions, the ability to bypass which will not be beneficial for either the business community, nor the state, that is, its steady implementation will be legislatively ensured.

Dependence of foreign economic security of pipe-rolling enterprises on stock markets and monetary and financial relations

The main problem in the activities of financial authorities that affect the foreign economic security of the pipe industry is the blind copying of similar structures "in the West". Thus, joining the International Monetary Fund (IMF) and the implementation of all its recommendations did not bring positive results. The Central Bank of the Russian Federation, instead of controlling the withdrawal of funds by banks accountable to it abroad, which flow annually in the amount of 3% of the Gross Domestic Product (GDP), maintains the discount rate at a high level. This automatically turns on the inflationary mechanism. The Russian Central Bank, by overestimating the yield of government debt, creates fertile ground for foreign speculators to rampage and keep the money supply in speculative circulation, which blocks lending to manufacturing enterprises. Which is fully confirmed

by the actions of the Central Bank of February 28, 2022, which set the discount rate at 20%.

Another problem that affects the foreign economic security of pipe-rolling enterprises, as well as the entire Russian economy, is speculative games in the stock markets, which often lead to crises.

The heavy administrative burden and difficulties with financial support contribute to the fact that some enterprises are registered in offshore zones, and this, in turn, negatively affects the overall financial climate, placing enterprises not associated with offshore zones in an unequal position. Large transnational corporations can serve as an example of such a policy.

The unstable political situation in the world also affects the monetary and financial relations between business partners, forcing them to look for new payment systems, and even a new reserve currency. The sooner this problem is resolved, the easier it will be in the future for us to survive the impending crisis, which will inevitably engulf the entire dollar system.

Conclusion

To ensure economic security and effective development of pipe rolling enterprises, it is necessary to immediately address issues related to the identification and neutralization of external threats and their consequences. The production of pipe products is a science-intensive, high-tech, strategically important and backbone link for the entire industrial complex of Russia. It is necessary for the dynamic development of both the entire fuel and energy complex and agriculture, engineering and construction. Therefore, overcoming the crisis that has arisen requires the constant attention of both the entire Russian business and government agencies responsible for economic development. That is, it is necessary to consolidate the efforts of all sectors of the economy, to ensure the planning of strategically important areas at the state level, using all available resources for this. In order to achieve the highest competitive advantages of pipe-rolling enterprises and ensure the maximum results of their economic security, the state authorities, with the interest and joint participation of business, should ensure the control of financing, monitoring, coordination of development programs, strategic planning and preferential taxation, that is, the improvement of the regulatory legal framework. Protection from threats to the economic security of the state should include the creation of a system in which, together with the implementation of currency control in the conditions of increasing turbulence in the world financial markets, clear protective mechanisms of the financial, distribution and property systems should be provided. As you know, Russia has been harnessing for a long time, but the time has come for a fast ride, when the full mobilization of production, economic and political means is urgently needed.

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阿巴坎侨民家庭的民族文化传统作为对年轻学童进行精神和道德教育的资源
ETHNO-CULTURAL TRADITIONS OF THE DIASPORA FAMILIES OF ABAKAN AS A RESOURCE OF A SPIRITUAL AND MORAL EDUCATION OF YOUNGER SCHOOLCHILDREN

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抽象的。 本文阐明了一项实证研究的结果，该研究旨在确定生活在哈卡斯共和国的侨民家庭中发挥作用的民族文化传统。 数据处理采用对话、问卷调查和内容分析等方法，总结出多民族在校儿童的精神道德教育需要考虑民族和文化传统的教育潜力。 和多元文化地区。
关键词：民族文化传统，小学生，精神道德教育，侨民家庭。

Abstract. The article illuminates the results of an empirical study aimed at identifying functioning ethno-cultural traditions in diaspora families living in the Republic of Khakassia. The methods of conversation, questionnaire and content analysis were used in data processing, which made it possible to summarize that it is necessary to consider the educational potentials of ethnic and cultural traditions of peoples for the spiritual and moral education of children attending school in a multiethnic and multicultural region.

Keywords: ethno-cultural tradition, junior school pupil, spiritual and moral education, diaspora family.

Purpose of the work: to acquaint the pedagogical community with research results on the state of spiritual and moral education of children in families of ethnic diasporas living in the Republic of Khakassia.

This paper presents some of the results of a collective study under the RFBR grant obtained in the period from 2021-2022. Among the scientific tasks of our work, significant was the identification of the features of the ethnocultural family traditions of the diasporas living in Khakassia and, in particular, in Abakan. In addition, we are studying the influence of these traditions on the social well-being

and education of children in our multinational republic and in the South Siberian region as a whole. The Republic of Khakassia, as an independent subject of the Russian Federation, located in the South Siberian part, in the basin of the Abakan and Yenisei rivers, is interesting not only for its geolandscape originality, but also for the preserved centuries-old ethno-cultural traditions that convey the accumulated experience of the spiritual and moral education of young people. Limiting ourselves to the format of the article, we will consider the key concepts that make it possible to meaningfully interpret research data.

Ethnocultural tradition in the most general sense is a tradition, an organic component of the ethnic culture of a people and a nation as a living mechanism for transferring the accumulated sociocultural experience through the native language consciously or on a subconscious level (G.N. Volkov [1], A.B. Pankin [3], K. I. Sultanbaeva [6]). As a rule, an ethno-cultural tradition lives in a family, community or society, it often transforms along with the consciousness of the bearers of ethnic culture, significantly affects the ethnic identification of a person. Ethno-cultural tradition is a phenomenon of the spiritual culture of an ethnic group, first of all; affects the material sphere of human existence.

As for the concept of "*spiritual and moral education*", scientists and theologians define it ambiguously, since it is the subject of study of all disciplines of the humanities cycle from various methodological positions. In general terms, spiritual and moral education is aimed at searching for the highest meanings of life, value-semantic orientations of a person, leading to the highest moral deeds and allowing a conscious moral choice to be made according to conscience, the inner motivation of the individual. Of course, this is a process of moral self-improvement of a person throughout his conscious life. One of the natural human needs is the need for self-realization through creativity and work, the need for a comfortable living space. At the same time, the ethno-cultural traditions of the family organize the sphere of life, provide value orientations for young people in the process of familiarization with family and everyday values, and preserve the historical precepts of their ancestors, i.e. perform the functions of spiritual and moral enrichment of the individual.

Migration processes around the world require an understanding of what an *ethnic diaspora* is. In the modern explanatory dictionary of the Russian language, the diaspora is "a large group of people as an ethnic community, for various reasons living outside the country of the main settlement in the position of a national-cultural minority" [5]. A sociological dictionary gives a more complete definition: "this is a stable set of people of a single ethnic origin (of one or related nationalities) living in a different ethnic environment outside their historical homeland (or outside the area of settlement of their people) and having social organizations for the development and functioning of their historical generality" [5]. Ethnic dias-

poras largely contribute to the development of a multinational and multicultural society.

The transition of modern societies to digital technologies undoubtedly affects the modern family, causing its transformation, including ethnocultural traditions. From the point of view of folk and cultural traditions, researchers note changes in the structure of the family, in the style of parent-child relationships, in the distribution of roles between parents, a decrease in the importance of physical punishment of children, the education of the qualities in a child necessary to achieve social success and well-being, and at the same time - decrease in knowledge and observance of national traditions, leveling of traditional values, more flexible adaptation of young people to modern conditions. Our research data generally do not contradict these findings.

And in such changing conditions, it is important to understand what kind of *identity* we want to form in *children*. Our research in Khakassia showed that the following particular factors play an important role in the process of interaction between teachers and children in a multicultural educational environment:

- knowledge by local educators and teachers of the peculiarities of ethnic culture, language and the basics of religious etiquette of children and students of migrants and their consideration in the pedagogical process of educational institutions;
- benevolent and tolerant attitude towards the language accent and poor knowledge of the Russian language by migrant children and their parents;
- knowledge of the basics of folk etiquette and the attitude to teaching on the part of parents - migrants, internally displaced persons;
- taking into account the degree of adaptation of ethnic representatives to the social conditions of life and educational institution; social status and status of families in which children of the diaspora group live;
- manifestations of bilingualism in speech communication and writing of children and adolescents. At the same time, it is important to distinguish between the specifics of the language and other ethno-cultural manifestations of representatives who arrived from different countries and regions.

As of January 01, 2021, 45 ethnic organizations operated in the Republic of Khakassia (including 32 organizations duly registered by the Office of the Ministry of Justice of the Russian Federation for the Republic of Khakassia, 13 organizations operating without state registration) [2]. In order to study the ethno-cultural traditions of the family and their influence on the well-being of younger schoolchildren, a local study was conducted of representatives of ethnic diaspora groups attending elementary school. The study covered children of primary school age from MBEI "Secondary School № 3" and Secondary School № 11, № 30 of

the city of Abakan of the Tuvan, Kyrgyz, Uzbek, Azerbaijani diasporas, since they belong to the most numerous ethnic groups living in the city of Abakan.

The study involved 60 children of primary school age 8 - 10 years old, of which: 30 boys (50%), 30 girls (50%); 29 (48%) Tuvans, 17 (28%) Kyrgyz children, 8 (13%) Uzbeks, 6 (10%) Azerbaijanis. The main research method was the author's questionnaire with 26 questions, as well as a conversation with individual parents and teachers who teach children of ethnic diasporas. The opinions of teachers did not always coincide with the answers received by the respondents. Accordingly, a more in-depth study of emerging contradictions in educational practice becomes a promising task.

The students-respondents are mainly from large families. 22 families from among the surveyed (36.6%) have three children; 15 families (25%) - 4 children; 11 families (18%) have 5 to 9 children. All children live in complete families, with their parents (87%), only 3% live with their mother. Grandparents (10%) and other relatives (20%) live in many families. 76.6% of the children-respondents noted that they have close relatives with whom they often communicate. 20% - do not communicate very often. 3.3% of junior schoolchildren showed that they do not communicate with relatives at all.

A special question concerned the language of communication in the family. The following was found:
- 89% of junior schoolchildren noted that parents communicate with them in two languages: "native and Russian";
- 11% of parents speak to their children only in their native language.
- There is no data on the communication of parents with children in Russian in Kyrgyz families.

In general, the study of the well-being of younger schoolchildren in the conditions of a multicultural and multiethnic society in the city of Abakan shows that a favorable picture is emerging in most families, characterized by the presence of parental love and attentive attitude towards children, close relationships with relatives who take care of each other. Most children experience a comfortable state not only in the family, but also at school. They are friendly, have many friends, among whom there are children of other nationalities, and the nationality of a friend does not matter to most. Younger schoolchildren of ethnic diasporas are socialized, they attend a swimming pool, a gym, an art school, have hobbies, go in for sports, a computer, and fine arts. The active functioning of bilingualism shows that the adaptive processes of younger students have positive prospects in a multicultural community. There is hope that representatives of ethnic diasporas will eventually show a willingness to accept the existing socio-cultural traditions of local peoples: Russians and Khakass.

We studied what traditions are observed in the family itself. Generalized responses vary in content and number. Respondents' responses are ranked in ascending order of choice, with the exception of the answer "I don't know". This can be clearly seen in figure 1 below.

соблюдение народных традиций в семье

не знаю	3,18%
наказания	0,49%
сохранение традиций	0,98%
общение с природой	1,47%
патриотическое воспитание, служба в армии	0,24%
национальная одежда	0,49%
знание родного языка	1,47%
гостеприимство	6,61%
соблюдение этикета, правил поведения	1,71%
пример предков	11,76%
изготовление национальных блюд	1,47%
общение с детьми, родственниками	0,98%
приучение к труду	12,90%
праздники, гуляния	25,90%
уважение к старшим, к семье	30,10%

Figure 1. The results of the study of folk traditions functioning in families

It is important to clarify that representatives of the Tuvan and Kyrgyz diasporas more often than others pointed to their own national traditions. However, in a number of responses from both parents and children, the celebration of the birthday of family members is attributed to folk traditions. Most respondents associate family tradition with holidays: Chyl pazy and Tun payram among the Khakas, Shagaa (New Year) and Naadym among the Tuvans, Eid al-Adha, Eid al-Adha and Navruz among the Kyrgyz and Uzbeks. The celebration of the New Year, Christmas, birthdays, March 8 and February 23 are singled out as national holidays [4].

It follows from our study that the priorities of parents are given to such traditions as respect for elders and family. The value of the family is unambiguously perceived by all respondents, regardless of ethnic and social affiliation. Then - accustoming to housework, joint holidays and festivities, observing guest etiquette. A significant part of the parents showed uncertainty and lack of knowledge of folk and family traditions. The ethno-cultural traditions of the diaspora family should indeed be perceived as a resource for moral education and spiritual enrichment of a growing personality, since most of them are based on folk wisdom, on common sense in family communication. Of course, the multicultural environment makes its own adjustments, hence we once again recall the problem of the formation of ethnocultural identification of children.

The main problems of raising children in a modern family of ethnic diasporas (Kyrgyz, Tuvans, Germans, Azerbaijanis, Tatars, Uzbeks) are identified:
- the strong influence of modern Internet technologies on the processes of interaction between parents and children, causing concern as a factor that destabilizes the educational impact of parents;
- decrease in children's interest in outdoor games, communication with peers,
- increased anxiety of schoolchildren in connection with the prospect of getting a "deuce", as well as friction in relationships with peers;
- a decrease in interest in their native ethnic culture among children studying in a multicultural school, etc.

Thus, it is quite obvious that it is impossible to ignore the educational and educational problems of bilingual children, younger schoolchildren, who require a slightly different pedagogical approach than monolingual students living in a multicultural educational environment. In the spiritual and moral education of younger schoolchildren from diaspora families, a significant role is played by the older generation with original ethno-cultural traditions, customs and religious beliefs.

Psychological and pedagogical support is required for children of ethnic diasporas at the stage of adaptation to schooling. As follows from a conversation with teachers, children whose parents have a residence permit in Russia tend to be more tolerant than new arrivals. In the intercultural communication of children of a multicultural children's team, various degrees of mutual understanding and cooperation are also manifested, this task requires special coverage.

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在专业教育中考虑和呈现设计作为实际技术的背景
CONTEXTS OF CONSIDERATION AND PRESENTATION OF DESIGN AS AN ACTUAL TECHNOLOGY IN PROFESSIONAL EDUCATION

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抽象的。 本文认为有必要综合职业教育理论与实践（管理、文化和科学）中提出的三种设计语境，以便从理论上理解和确立设计的文化实践作为一种管理活动的程序和实践的主要方法。 以科学为导向，并按照现代方法论、文化、科学、心理学、社会教育学的规定，设计作为一种社会文化现象出现。
关键词：专业教育、设计、管理背景、文化背景、方法论方法、设计实践。

Abstract. The article considers the need to synthesize three design contexts presented in the theory and practice of vocational education (managerial, cultural and scientific) in order to theoretically comprehend and establish the cultural practice of design as a procedure of managerial activity and the main method of practice-oriented science, and in accordance with modern methodological, cultural, scientific, psychological, socio-pedagogical provisions design appears as a socio-cultural phenomenon.

Keywords: professional education, design, management context, cultural context, methodological approaches, design practice.

Having originated in the field of technical activity, such a socio-cultural phenomenon as design has been decisively spreading in recent years to traditionally humanitarian activity systems, including education.

The global operational characteristic of design is its focus on transformation, "design always acts as the transformation of some existing objects into a new form" [5, p. 134].

At the very beginning of the conceptual embodiment of the idea of designing social systems, representatives of the methodology of systems of social activity drew attention to the fruitfulness of project activity for pedagogy as a science and practice. With regard to the first circumstance, G.P. Shchedrovitsky pointed out the need for methodological research as the first stage of the organization of pedagogical developments. It is the methodological foundations "that should give us a general project of pedagogical science and a roadmap for all upcoming pedagogical research, according to which the order and pace of all private developments will be established" [6, p. 69]. At the same time, it is very important and essential that natural science knowledge about "man", from whatever point of view they may be introduced and no matter how complex and synthetic they may be, cannot replace pedagogical projects of "man". Therefore, along with the study of people living now or who lived in the past, there remains a special activity of pedagogical design of a "person". The last quote contains another (along with an indication of transformation) design characteristic - the appeal of the project and the projected transformations to the future. The design was included in a broader management context as a special procedure.

The management context was developed in sufficient detail by representatives of the methodology of the systems of my activity, starting with the distinction between the concepts of "management" and "management", introduced by G.P. Shchedrovitsky, and ending with the presentation of the technological cycle of management activities with the inclusion of the design procedure, designed by O.S. Anisimov.

At the same time, in line with the considered methodological school, another design context was set - the context of culture. At the same time, the emphasis is placed on the culture of thinking and activity of the designer as a necessary condition for the implementation of the manager's activities. That is, the cultural context was introduced in the same management framework. However, already in the early 90s, social changes obviously actualized the line of design consideration in the context of culture. It is not by chance that N.G. Alekseev identifies two stages, two situations of representation of the reality of design.

The first period is associated by the author with the general social changes in the country and is characterized through the provision of freedom of activity, including, above all, design activities (in the context of management). This stage is marked by a massive surge in the practice of spontaneous design, especially evident in the field of education. The "projects" of development are put forward by multi-level subjects of education: starting from a separate school and ending with entire educational regions. The finale of the described situation revealed the absence of cultural design practice and led to the realization of the need to give it a cultural form, which was the essence of the second period of the existence

of design in the field of education and that gave rise to the designation of project activity as a cultural form of innovation. This (cultural) context of understanding design as a mass, albeit spontaneous, practice attracted attention and required the efforts of not only methodologists, but also representatives of science, primarily psychological.

The essence of the second way is the theoretical understanding of the laws and patterns of specific activities for the creation of educational development projects. But since life required decisive and immediate transformations, and the traditional type of scientific knowledge could not directly influence the development of practice, design was introduced into the context of practice-oriented science. "In these conditions, every scientist working in the field of education finds himself in a rather difficult situation. He suddenly realizes that the research he conducts does not determine the state of affairs with education and does not turn education into a subject of practical action. The narrow subject interests of a scientist turn out to be incredibly important for the development and change of the scientific culture itself, but at the same time they turn out to be isolated and disconnected from the development of educational practice" [2].

Design was put forward as the main method of a new type of scientific approach, which some authors (V.V. Rubtsov, V.I. Slobodchikov) call practice-oriented science, while researchers of methodological orientation (Yu.V. Gromyko, etc.) express through the concept of a program-project approach. In the sphere of pedagogical science proper, the most complete ideas about design belong to G.K. Selevko [3]. Relying on the works

A.S. Makarenko, the researcher introduced the concept of "pedagogical technology" into the scientific and pedagogical context; filled the concept of "concept" with additional content, considering the latter as a basic component of the pedagogical project; he revealed the essence of the project activity regarding the training and education of students, including in the design formulation and description of the purpose of the future pedagogical system, planning of the didactic process based on the allocation of intermediate goals, selection and justification of the content of training and education, indicating the time for its study, selection of educational technologies with their objective methods of quality control of the educational process, description of organizational conditions for its implementation. At the same time, the author focused on presenting the components of the project, but not on the design process itself; actually identified the concepts of "concept" and "project"; turning the project into the future, recognizing its focus on development, relied on "standard technologies"; used the concept of "project" as arbitrary, which often led to its inadequately wide application in everyday meaning is a possible, preliminary option.

In accordance with modern methodological, cultural, scientific and psychological, sociological and pedagogical provisions, design appears as a socio-cultural phenomenon, the main characteristics of which are: the focus of targeted efforts on pre-planned transformations; turning to the reality of the future, which is born in thinking and is provided through reflection; focus on the development of the projected object.

Design is included in the context of managerial activity, practice-oriented science and is considered as a cultural form of innovation in education.

At the same time, the three mentioned contexts, both in theory and in practice, are presented in isolation so far (although, undoubtedly, they have a common basis, expressed through the characteristics noted in the definition). This circumstance, combined with the special relevance of design, associated with the active reform of both the state and social structure, and education, inevitably require a theoretical understanding of the very essence of design, on the one hand, and ways of mastering it by educational practices, on the other. Thus, we come to the problem of the need to synthesize the three design contexts presented in the theory and practice of education (managerial, cultural and scientific) in order to theoretically comprehend and establish in education workers the cultural practice of design as a procedure of managerial activity and the main method of practice-oriented science.

The managerial context of the reality of design, which we have called, could more accurately be designated as methodological, since its source, the place of generation is methodology, namely, the methodology of systems of mental activity. Its representatives (N.G. Alekseev, O.S. Anisimov, O.I. Genisaretsky, Yu.V. Gromyko, A.G. Rappoport, V.M. Rozin, Shchedrovitsky, P.G. Shchedrovitsky, etc.) have accumulated a whole range of knowledge about how the activity is organized, in what ways it is possible to influence and transform it. In accordance with this knowledge, its norms act as the governing regulators of activity, they determine the type, nature and content of a particular activity. Norms are representations of activities that have the nature of prescriptions for implementation.

There are different types of norms that determine the content of the activity with different completeness. These include (according to O.S. Anisimov):

• the approach is the fundamental basis of activity, something that remains unchanged when analyzing and constructing any particular phenomenon of normalized activity;

• principles - generalized representations that act as a means of specifying the approach;

• the goal is the simplest type of activity norm, an indication of its result (product), a description of the characteristics of qualities, properties of the final product of activity (in the field of education - a person);

• a plan is a sequential series of identified and described intermediate products of an activity on the way to achieving its final result (product).

At each stage of achieving the result, it is assumed to receive its own (intermediate) product, which acts as a goal for this part of the unified activity.

In order for the activity to be launched, the regulatory contents defining it must be transferred to the contractor. The more types of norms the implementer of the activity has, the more guarantees of achieving the intended end result.

Thus, management is an activity over an activity, and the object of managerial work is another activity. It is the development of managed activities that is the goal of management. Directing attention to its object - controlled activity, management has its norms and socio-cultural forms of organization as the subject of influence. Management procedures include methodological analysis of managed activities, analysis of the socio-cultural situation and norm-building. Becoming an organizational attitude to the object of management, the manager transforms such norms of managed activity as approach, principles, goal, plan, technology, identifies resources more appropriately, i.e. carries out design, on the basis of which he develops a program for the performer (carrier of managed activity) and programs his own actions. The implementation of these procedures is ensured by the availability of means, which, first of all, include knowledge about the norms of activity, socio-cultural forms of its organization, norm-building, the main directions of development of the sphere of its existence, the requirements of the socio-cultural situation. The listed knowledge is designed to provide management.

The algorithm of management actions (procedures) is a continuous cycle of the management process. It begins with the acceptance of an order or the implementation of a self-order for management activities in connection with the inconsistency of the norms of activity identified by the manager with the requirements of the socio-cultural situation. The result of acceptance, understanding The purpose of the order is the manager's idea of the final product to be obtained within the framework of the managed activity. This is how the simplest norm of future activity is formulated - its goal. This is done on the basis of the approach and principles defined by the manager. Next, he must present the entire path from the source material of the activity to the intended final product. The sequence of obtaining intermediate products is fixed in such an activity norm as a plan. Describing the characteristics of the procedures and means that ensure the receipt of each of the selected intermediate products, the manager builds the technological characteristics of the stages of activity fixed in the plan. The technological characteristics compiled on the basis of the plan collectively represent the technology of future activities. The presence of this norm gives the manager the opportunity to identify and fix appropriate resources. The manager, who built up such norms of future activity as the goal, plan, technology, and fixed activity resources within the framework of the approaches and principles defined by him, carried out the design.

The presence of the project allows the manager to proceed to the following procedure: to program the actions of the executor of the managed activity and his own for the implementation of the project, i.e. the development of the activity. As soon as the norms established by the manager become the property of the performer, the created activity begins to function. The circle of management procedures has closed. Further, the manager should carry out the same procedures (methodological analysis of the managed activity, analysis of the socio-cultural situation, correction of norms or norm-building) in order to monitor the progress of the managed activity. In accordance with our plan, it is possible to combine the processes of creating norms (rationing activities) and transferring regulatory contents to future performers of activities by including them in the design process. Thus, the carrier of the activity develops its norms for himself.

Here it is necessary to point out another management function - coordination. Each well-established activity sphere, including education, has the character of a complex system that includes various types of activities. Each figure of the system perceives its own norm as a separate whole. For the manager, these standards act as parts of a single, integral norm. When dealing with the activity system, the manager must bring all possible complications of the activity into line with the receipt of the final product. Since each of its components functions within its own goal-setting, the absence (or "incontinence") of an integral norm can lead to a mismatch in the system. To avoid this, the manager must constantly regulate the relationship between the various activities of the integrated system.

In the domestic education system, individual units of holistic activity have long been firmly autonomous. The situation is further aggravated by the fact that each link of the conveyor, in addition to its leader, has received its own manager. To restore the integrity of the activity is one of the primary tasks of education management. To resolve it, at least, there should be a position of a manager who is able to build an image of continuous human education activities from preschool to adulthood through the design of its normative contents - the approach, principles, ultimate goal, plan and complete technology that are uniform for all educational levels. In more familiar language, this is called ensuring the continuity of education. This can and should be done at different scales of the educational sphere. So far we have been talking only about the initial, or basic, activity of the education system, about its division into links, the device on the principle of a "conveyor". In education, such a basic process is the activity of teaching and educating a growing person. But in addition to the basic, in each activity area there is still a fairly large number of service or service processes designed to provide basic activities with the necessary resources. These include research activities aimed at obtaining knowledge that fixes the patterns of the phenomena being studied. The relations of research activity with the practice of teaching and upbringing are mediated

by management activities, i.e. it is management that serves as an intermediary between science and practice. Autonomous activities can be in different types of relationships with each other. The manager's concern is primarily related to the establishment and support of cooperative links between the basic and service activities of the system.

In addition to the described procedural characteristics, management, and, consequently, design in the context under consideration, should have a number of other qualities. First of all, it should be of a collegial nature, that is, a group of people should take part in management activities, each of whom has the right to express his point of view on the issue under discussion. If the decision-makers wish, these opinions can be taken into account.

Thus, in the managerial (methodological) context, the main procedural characteristics of design as a special procedure of managerial activity aimed at the development of the object of management of the managed activity are set. It is within this context that design is provided technologically for the first time.

In the cultural context, design acts primarily as a way of rationing and broadcasting innovations. However, in order to do this, a certain organizational type of culture must develop in childhood. Designing as a cultural form of innovation in any field of activity and, in particular, in education, during the transition to a technological way of organizing society and culture, allows us to overcome a number of contradictions that have developed within the framework of the previous, professional, type of organization. Among them V.A. Nikitin refers to the following circumstances: division of the unified scientific picture of the world into at least two - natural science and humanities; creating ideas about changing scientific paradigms; a sharp increase in the fragmentation of established professional fields into specialties; multiculturalism and the impossibility of co-organizing a "mosaic" society by means of modeling, able to highlight the common, but not adapted to the retention of different; the massive nature of the project creation activity, which is based not on modeling, but on design the readiness of practitioners for it in connection with the provision of design is not so much theoretical knowledge as analytical work; a sharp increase in the availability of professional knowledge and the destruction of the boundaries of professional communities that "guarded" the theoretical core, which was especially pronounced in the creation of a publicly accessible international computer network Internet.

The material for the production of projects are symbolic forms generated by professional culture: theories, models, concepts, formulas, algorithms, etc. Technologies developing in the fields of mass communications, management and finance, information services, and education have become the leading way of their organization at the present stage. Since no profession, theory or subject area of science can provide the entire technological cycle, their capacity is determined by

the very possibility of competently being included in it. Hence, self-determination in modern technological culture is understood as a designation of one's place in the creation and implementation of a project (or program).

To realize the possibility of self-determination, the subject must have the ability to occupy one of five hypothetical positions in the cultural cycle: the keeper, distributor, systematizer, creator and organizer of cultural forms. The main function of the keeper is to preserve all traces of cultural activity, a kind of cult of these traces, denial of innovations, the distributor in all the variety of innovations gives preference to one new phenomenon and actively participates in its promotion, giving it cultural and social significance. The main purpose of the systematizer is to create theories, typologies and systematics of cultural innovations in order to neutralize the actions of distributors. The function of creating innovations is assigned to the position of the creator. The organizer is called upon to coordinate and co-organize the activities of these cultural and technical cycle positioners. For the activity of pedagogical design as a cultural form of innovation in education, the positions of systematizer, creator and organizer are particularly interesting.

The position of the systematizer becomes particularly relevant due to the fact that the modern material of pedagogical design (paradigms, theories, models, concepts of pedagogy) is in dire need of, so to speak, inventory.

In the course of designing with a focus on the data of pedagogical systemology, the value-paradigm self-determination of the subjects of project activity should occur. Having identified five main paradigms in modern pedagogical reality (natural science, technocratic, humanistically oriented, esoteric and transitional polyphonic), O.G. Prikott identified an example, demonstrated a sample and revealed the methodological foundations of the activity of the systematizer of pedagogical culture [4].

The position of the creator of culture in our view coincides with the position of the designer, for him "... culture is a place of self-expression, the embodiment of his attitude to the world and the experience of being in it, the struggle for his understanding and the right to present it" [1]. And here the value-paradigm foundations come to the fore, and the principle of their coordination in the team of designers is the principle of communication and, possibly, personal relationships. At the same time, communication can be understood as a specific exchange of the contents of professional positions in the means of natural language. The characteristic features of communication as a special form of human social existence are: a common subject of discussion, equality of positions of all participants, the sharing of value orientation by all to understand the point of view of the other.

New to our mentality is the position of the organizer, for whom culture is, first of all, a place of struggle between tradition and innovation. The conflict between the old and the new can have seven directions of unfolding: expansion, assimi-

lation, development, creation, exchange, repetition and annihilation. But, taking into account such a sign of design as a focus on development, we will clarify its understanding in the layer of cultural forms. In the cultural context, development appears as the formation of a new phenomenon in the case of coordination of tradition and innovation in a common framework. The organizer of culture is primarily interested in the means and mechanisms of the very design and implementation of pedagogical projects. And here an important circumstance is the "place of work" of the organizer, from which, in our opinion, the choice of the method of rationing and broadcasting of project activities depends on him. If the traditional type of culture represented by communal groups with their separation according to the principle of "friend-foe" is a priority in the organizer's place of action, then the design here acquires a ritual character. For a place with a priority corporate-craft type of culture with its rigid hierarchical structure, the main way of rationing project activities will be a sample of a viable project and a recipe for its reconstruction. Along with the predominantly professional type of culture, such a way of rationing project activities as theoretical understanding, conveyed in the form of a text, is most appropriate. Finally, the modern, technological, type of culture in the place where it turns out to be a priority, suggests a new way of introducing design into the cultural context, namely, technological in the form of transfer of technological schemes of project activity. In contrast to the text as the basic idea of transmitting content in professional culture and the sample in craft culture, the basic idea of the screen is used within the framework of technological culture. This correlates with one of the leading design features, since the transformation procedure was applied specifically to the screen, unlike the sample (reconstruction procedure) and the text (reconstruction procedure). The idea of a screen can best be implemented using such a semiotic means as a scheme, which, unlike a model, allows you to project different things onto one image.

Thus, in the context of culture (or rather, technological-type culture), design is considered as the main way of rationing and broadcasting innovations with an emphasis on the value attitudes of cultural and technical cycle positioners, consistent on the principle of communication and personal relationships, using the idea of a screen and a technological scheme.

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根据"2 + 2"模式为乌法国立石油科技大学商业生态系统和创意产业研究所的学生设计一个教育空间

DESIGNING AN EDUCATIONAL SPACE ACCORDING TO THE «2 + 2» MODEL FOR STUDENTS OF THE INSTITUTE OF BUSINESS ECOSYSTEMS AND CREATIVE INDUSTRIES OF THE UFA STATE PETROLEUM TECHNOLOGICAL UNIVERSITY

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注解。 本文考虑了根据"2 + 2"模型为乌法国立石油技术大学商业生态系统和创意产业研究所的学生在 09.03.03 应用信息学、38.03.01 经济学课程下设计教育空间的经验 ， 38.03.02 管理，38.03.04 国家和市政管理，41.03.01 外国区域研究，43.03.02 旅游，43.03.03 酒店业务。 该模型建立在生态系统发展的原则之上，作为教育过程实施的一部分，同时考虑了竞争环境的形成和发展。

关键词："2+2"学习模式、基础教育课程设计、文科教育模式、联邦州教育标准、通用能力、一般专业能力、数字能力、基于项目的学习。

Annotation. *The article considers the experience of designing an educational space according to the «2 + 2» model for students of the Institute of Business Ecosystems and Creative Industries of the Ufa State Petroleum Technological University under the programs 09.03.03 Applied Informatics, 38.03.01 Economics, 38.03.02 Management, 38.03.04 State and municipal administration, 41.03.01 Foreign regional studies, 43.03.02 Tourism, 43.03.03 Hotel business. The model is built on the principle of ecosystem development as part of the implementation of the educational process, taking into account the formation and development of a competitive environment.*

Keywords: *«2+2» learning model, design of basic educational programs, Liberal Arts Education model, federal state educational standards, universal*

competencies, general professional competencies, digital competencies, project-based learning.

The events taking place in the world over the past 3 years have clearly shown the ripe need to transform the modern system of Russian higher education, one of the stages of transformation was the transition to the model of education according to the «2 + 2 + 2» scheme. The «2 + 2 + 2» system implies that the first two years of study will be devoted to fundamental knowledge and the formation of a comprehensive picture of the world among students, the second two years to profiling, and the last two years, already in the magistracy, to deepening knowledge.

The new scheme is deciphered simply: for the first two years, students receive a broad education, and they will be able to finally decide on the direction of training after the second year of study. The next two years are devoted to more focused training in accordance with the chosen direction. The last two years have been the master's program, which should be redesigned for the new logic of the undergraduate program and not repeat its content, as is happening now. At the same time, for a master's degree, it is recommended to change the university in order to gain access to new ideas and methods.

It should be noted that today the «2 + 2 + 2» scheme is not yet mandatory, but voluntary, so a total transition to this model should not be expected.

Despite this, since 2021, the Ufa State Oil Technical University has also begun preparations for the introduction of training according to the «2 + 2 + 2» scheme. So, for example, at the Institute of Business Ecosystems and Creative Industries, this scheme will be introduced from September 2022 for students in 5 areas of training - Tourism, Hotel business, State and Municipal Administration, Economics, Management, Foreign Regional Studies, Applied Informatics. These transformations have several goals - the design of basic educational programs (hereinafter referred to as BEP) with modules that form digital skills, interdisciplinary modules of project-based learning, the design of modular disciplines, the individualization of educational trajectories with the opportunity for students to choose options for multi-level disciplines, the organization of forms of this choice.

The process of preparation and implementation of this scheme took place in several stages.

The first stage was the work on the processing of the common core (CORE) for educational programs for admission in 2022, while the task was to maintain the synchronism of the educational process as part of the development of universal and general professional competencies. Further, there was an adaptation of the competency matrices for the blocks of universal competencies and general professional competencies (hereinafter referred to as GPC) for 7 areas of training - Tourism, Hotel business, State and municipal administration, Economics, Management, Foreign regional studies, Applied informatics.

The next step was the development of a curriculum template according to the «2 + 2» scheme for 7 areas of training - Tourism, Hotel business, State and Municipal Administration, Economics, Management, Foreign Regional Studies, Applied Informatics.

Further, a block of minors (additional mini-specializations) was developed, as well as programs of additional professional education identical to them, and a catalog of elective courses was formed to enable the implementation of educational programs according to the Liberal Arts Education model.

Liberal Arts Education (from the Latin "*liberalis*" - free and "*ars*" - arts) is a system of education that has found the greatest distribution in US higher education institutions in the middle of the 20th century. A feature of this educational system is the freedom to choose subjects. The student creates his own curriculum. This can achieve a unique interdisciplinarity and greatly expand the scope of skills and competencies acquired in the learning process.

As a result, when forming curricula according to the «2 + 2» scheme, 5 main components of the blocks were identified:

1) An interdisciplinary cross-cutting module aimed at the formation of design competencies in 1-2 courses, as well as a module that forms professional design competencies in 3-4 courses.

2) A block of compulsory disciplines that form universal competencies according to federal state educational standards (hereinafter - FSES), Hard Skills, Soft Skills.

3) Block of elective disciplines and minors.

4) A block of modular disciplines that form groups of general professional competencies that are mandatory for 7 areas of training.

5) A block of professional disciplines that form the professional competencies of each area.

Обязательная часть BEP формирует универсальные компетенции и включает обязательные по FSES дисциплины - философия, история, безопасность жизнедеятельности, иностранный язык, физическая культура, а также дисциплин, формирующих «Hard Skills».

Further, to form the core, an analysis was made of the closest similarity and the possibility of classifying the GPC on similar grounds for the areas of study Economics, Management, State and municipal administration, Applied informatics, Foreign regional studies, Hospitality, Tourism. 5 main categories of GPC were identified in all areas: law, management decisions, analytics, information technology, project activities. It became clear that most of the GPCs can be grouped into these categories, however, a number of GPCs are quite profiled for the areas of training - this is especially noticeable in the areas of Applied Informatics, Tourism, and Hotel business.

As a result, a clear set of disciplines and modules was defined, selected so that all common for 7 GPC areas were formed, which generally cover the study of applied technologies for service maintenance and territorial development.

At the 5th, 6th and 7th semester, students begin studying in the Minor block - an additional specialization with the opportunity to receive a diploma of professional retraining in parallel with a diploma of higher education, subject to its successful completion. Taking into account the current conditions of the labor market, 8 blocks of minors were proposed for the following tracks - digitalization, green technologies, economics, law, the service sector, mobile services. Thus, the student will be able to choose a major that is generally different from his main profiling.

This is followed by a block that forms the competencies of project activities. Design workshops is an inter-departmental cross-cutting course for 1-2 years, fully aimed at project-oriented learning. Projects are formed according to the problematic tasks of the institute and the university and the territory as a whole, which students solve in teams while working on the project.

Professional design workshops - a discipline for 3-4 years, also aimed at project-oriented education, work is being done on a pool of gaps, formed for the tasks of graduating departments for 3-4 years.

Another important element is educational and industrial practices, as well as work on a diploma, which are now so embedded in the educational process that they are a logical continuation of projects and work begun in junior years as part of project activities.

All disciplines are selected taking into account the requirements of FSES in all areas presented.

As a result of the work carried out, draft curricula were formed, synchronous for the first joint two years of study for all seven areas of training.

An extremely important factor in this approach to the formation of BEP is the fact that the model is built on the principle of ecosystem development - norms and rules are established that will lead to the fact that only competitive courses developed by highly qualified teaching staff will enter the educational space.

过度正当化的影响——现代地缘政治条件下社会管理的相关现象
THE EFFECT OF EXCESSIVE JUSTIFICATION – A RELEVANT PHENOMENON OF SOCIAL MANAGEMENT IN MODERN GEOPOLITICAL CONDITIONS

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抽象的。多危机条件下人们社会行为的自我调节机制平衡问题的文献分析。假设在现代地缘政治条件下，社会意义行为转变的刺激和抑制机制之间的平衡被打乱，根据悖论原理，过度的积极外部刺激导致行为模式从建设性转变为破坏性，即有助于过度合理化的效果。该假设以参与专业活动的人员进行自我测试以确保综合安全为例进行了测试（n = 445 名受访者）。通过 SAN 方法（健康、活动、情绪）经验性地使用在线测试。对于经验材料的比较处理，采用了变分统计、配对相关分析的方法。显示了根据用于组织社交活动的算法的受访者的异质性。过度合理化影响发展的风险群体由在克服困难方面具有有限社会经验的年轻受访者组成。建议考虑到容易受到过度合理化影响的目标群体人口中的存在，并将这些知识纳入不同国家旨在巩固其在该领域的联合活动的最佳公共政策结构中和平与综合安全。
关键词。地缘政治、多重危机、悖论现象、复杂的安全、公共政策、公共活动。

Abstract. *The analysis of the literature on the issue of the balance of the mechanisms of self-regulation of the social behavior of people in the conditions of multi-crisis. It is hypothesized that in modern geopolitical conditions, the balance between stimulating and inhibitory mechanisms for the transformation of socially significant behavior is disturbed and, according to the paradox principle, excessive positive external stimulation causes a transition from a constructive to a destructive model of behavior, i.e. contributes to the effect of overjustification. The hypothesis was tested on the example of self-testing of persons involved in professional activities to ensure integrated security (n=445 respondents). Empirically using online testing by the SAN method (Health, Activity, Mood). For comparative processing of the empirical material, the method of variational statistics, paired*

correlation analysis, was used. The heterogeneity of respondents according to the algorithm for organizing their social activity is shown. The risk group for the development of the effect of overjustification consisted of young respondents with limited social experience in overcoming difficulties. It is proposed to take into account the presence among the population of target groups that are vulnerable to the development of the effect of overjustification and build this knowledge into the structure of the optimal public policy of different countries aimed at consolidating their joint activities in the field of peace and integrated security.

Keywords. *Geopolitics, multicrisis, paradox phenomenon, complex security, public policy, public activity.*

Russia and China are countries with a rich history. Each of them has its own unique experience of successful socio-economic transformations. For example, in the book [1; p. 143] describes in stages a complex mechanism for implementing a comprehensive reform of the country's economy, which requires "a clear understanding of the starting conditions; …carrying out a comparative assessment of various medium- and long-term target models; …exploring the main direction of reform for the coming years, …development of concrete policies to support reform measures, including the use of indirect methods of regulation and control; ...carrying out detailed calculations and justification, so that already at the stage of drawing up a reform project, problems that may arise can be excluded or kept under control; ... strengthening feedback so that in a timely manner, in accordance with the specific situation, make the necessary adjustments and improve the overall project".

The modern historical moment in the development of human civilization is characterized by a unique combination of a number of factors that affect the ability of the population to perceive new changes and include them in the models of their socially significant behavior. Such factors, in our opinion, include global changes in the architecture of international relations, the modification of social and personal priorities, the general digitalization of the life of the planet's population, which is carried out in different regions of the world at an unequal speed and increases the cognitive and informational heterogeneity of the population of different countries and regions. The listed factors of socio-economic transformations are carried out at an unprecedented speed, which, according to many experts in the field of social psychology, can exceed the speed of a person's psychophysiological adaptation to a changing environment. It is known that excessive external stimulation causes a natural phenomenon of inhibition of nervous processes in the human body. This psychophysiological effect, as well as the effect of creating a dominant in the structure of mental processes, was described at the beginning of the XX - XXI century, supplemented our knowledge of models of socially modeled human

behavior with such phenomena as imposed rhythms and the release effect. The first, among other things, describes the need for the presence of low-frequency rhythms in human activity for the effective perception, assimilation and translation of high-frequency ones. The second, the release effect, indicates a high risk of inappropriate risky behavior after the termination of some relatively long period of restriction of social, territorial and geographic mobility. However, the result of the interaction of these phenomena in the process of transforming the social behavior of people has not yet been analyzed in detail, although the attention of researchers to the creation of a data bank of models of dangerous behavior of people in the era of digitalization is obvious. A priori, it can be assumed that the spontaneous combination and interaction between mechanisms that accelerate and inhibit the creation of new forms of social behavior among the population is fraught with unexpected and unpredictable results.

According to the provisions of the theory of evolution and their application to human evolution, adaptation to changing environmental factors can be expressed in three scenarios: positive, neutral and negative. In the conditions of geopolitical multicrisis, a transition from progressive to regressive evolution is possible. According to the formulations stated in the book [2; p. 258], "with fairly rapid changes in the environment, the struggle for existence becomes much more acute, ... with the introduction of new eliminating factors to which the organism was not adapted," progressive evolution is replaced by "neoteny" (general underdevelopment) or even regressive evolution, "catamorphosis". The transition from one form of evolution to another passes through the stages of functional transformations of both an individual organism and entire communities. With regard to the sphere of international relations and public policy, such a negative transition is undesirable. Therefore, the search for optimal forms of social management of the progressive development of countries is closely related to the psychophysiological readiness of the population as a whole and its individual groups to successfully adapt to a rapidly changing environment, to conditions of multi-crisis, risk and uncertainty.

In our opinion, effective management of the activities of target groups of the population in the field of international and public policy should be based on taking into account the optimal balance of stimulating and inhibiting mechanisms for transforming people's social behavior.

The disruption of the creation of a multipolar world in modern conditions can be facilitated by such a phenomenon as the effect of excessive justification. The overjustification effect occurs when an expected extrinsic stimulus, such as money or prizes, reduces an individual's intrinsic motivation to complete a task. The effect is also manifested in the fact that the personal initiative emanating from the individual and conditioned by his humane need to be integrated into a progressive

society can be extinguished by socially organized excessive measures aimed at supporting the initiative proposed by the individual. The paradox of the situation is explained by the fact that if the planned events generate similar activity in most people, incl. who do not have an individual need for the proposed initiatives, then the role of an individual, who initially became the source of an innovative model of social behavior, is significantly diminished and loses its attractive power. The process of paradoxical transformation of a positive model of behavior into a negative and even destructive one occurs spontaneously, is difficult to correct and predict; however, requires close attention and study. In our opinion, this thesis is, first of all, relevant for the social management of volunteering and volunteerism, which are characterized by a wide variety of their forms and content and, in recent years, have been actively spreading, incl. on the sphere of international relations and humanitarian assistance in emergency situations.

Volunteer activity as an object of study of the effect of excessive justification and the phenomenon of paradox in the form of the transformation of positive models of social behavior into negative ones seems to be quite timely. This is confirmed by the following publications. There are works devoted to spontaneous volunteering [3]. The fact of the formal attitude of the majority of school volunteers to participation in public events and the absence of their subjective identification with the volunteer movement after many years of popularization of volunteerism among young people was recorded [4]. It has been established that among the volunteers who are preparing to provide assistance to victims of disasters, only a small percentage of the participants in the movement are sincerely interested in obtaining the necessary professional skills; and the majority participate in training courses in order to expand the circle of acquaintances and communication [5, 6]. The trend towards a spontaneous transformation of social relations in the era of digitalization and global modernization of the architecture of international relations has been designated by a number of experts as a transition from a welfare state to a social society [7], which develops according to its own laws that are not amenable to direct directive control. The team of authors designated this process as "self-regulation of the life of young people" [8, 9].

In this study, the author's attention is focused on the analysis of the algorithm of non-verbal communication of future rescue volunteers under conditions of social stress. Three situations were analyzed as social stress: leaving for mass sports competitions with international participation, passing an examination session after the first year of study at a departmental university, and being at preparatory courses before entering a university of the Russian Emergencies Ministry. It seemed to us theoretically important and practically significant to study the algorithms of social communication among young people in the context of a change in lifestyle. As a control group, employees of rescue services with professional experience of

five years or more, as well as senior cadets of the Ural Institute of the State Fire Service of the Ministry of Emergency Situations of Russia, who are successfully mastering the curriculum, were examined. The empirical database included 445 observations. The collection of empirical data was carried out using the HAM (Health, Activity, Mood) test. The test allows you to describe the bodily, emotional and active components of the socially significant communication of the individual. The quantitative nature of the test makes it possible to use it as a sociometric tool, highlighting the specific features of the communicative activity of the target population groups. In our study, for a comparative analysis of groups of respondents, the method of variation statistics and paired correlation analysis were used.

Earlier, we showed that when going on a business trip, the models of non-verbal communication of young rescuers undergo significant changes, while the perception of the future and the algorithm for planning it are not the same for young professionals and their mentors, which complicates the process of transferring experience across generations and reduces the accuracy of predicting expected actions in both age groups.

In the present study, clarifying data were obtained. It was found that the indicators of the three scales of the HAM test are interconnected by strong positive pairwise correlations among respondents who belong to the group of successful senior cadets and to the group of professional rescuers with five years of work experience or more. For these groups of respondents, it is possible to predict the level and success of their social activity based on subjective self-assessment of well-being and mood. Thus, the internal and external control loop of the social activity of these two groups of respondents constitutes a single integral system of communication with the outside world. Young respondents with limited social experience of overcoming difficulties (applicants of preparatory courses and cadets of junior courses during the session) showed a dissociation of the external and internal circuits of managing socially significant behavior. The absence of correlations between activity and mood, between activity and well-being was recorded. This means that the pattern of social behavior of the respondents of the last two groups in extreme situations requiring a personal decision will be dictated mainly by external incentives without taking into account internal reserves for the implementation of the decision. This self-regulation algorithm can reduce the effectiveness of the social activity of young rescuers in a multi-crisis environment. Dissociation of the integral system of non-verbal public communication, its so-called dissipation, creates conditions for the realization of the effect of excessive justification. Such an effect among vulnerable groups of the population may arise when public policy measures are redundant and / or inadequate, aimed at the widespread activation of volunteer actions.

Conclusion. The analysis of the literature and author's empirical studies allows us to conclude that the algorithms for self-regulation of social activity of target groups of the population, designed to participate in minimizing damage from emergency events and disasters, are heterogeneous. The computer method of express diagnostics HAM (Health, Activity, Mood) allows monitoring vulnerable groups of people who have an increased risk of developing the effect of overjustification. Taking into account the presence of such a category among the population opens up new prospects for the formation of an optimal public policy of different countries aimed at consolidating their joint activities in the field of peace and integrated security.

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丹·布朗的阴谋小说《天使与恶魔》中的艺术世界观
THE ARTISTIC WORLD VIEW IN THE CONSPIRACY NOVEL "ANGELS AND DEMONS" BY D. BROWN

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抽象的。本文旨在界定美国记者兼作家 D. Brown 创作的阴谋小说《天使与恶魔》中艺术世界观的特征。该研究的创新方面与侦探小说散文的一个新的子类型——阴谋小说的研究密切相关。在构建小说的艺术世界观时，作者创造了自己的反映。这些特点反映了作家的世界观。艺术世界观的特点是故事的类型、作者的世界观、艺术家的个人风格、故事的创作时间和主题。小说《天使与恶魔》的艺术世界观建立在宗教和科学领域的对立之上。作者是后非经典时期科学发展的杰出代表。为了发现我们世界的本质，将非理性和理性的方法结合起来的时期。因此，这些特点有助于作者在他的小说中创造出一种独特的艺术世界观。艺术家世界观中宗教和科学领域的结合激发了人们从语言部分研究这部小说的兴趣。
关键词: 艺术世界观、世界观、阴谋小说、二元性、个人艺术家风格。

Abstract. The aim of this article is to define characteristic features of the artistic world view in the conspiracy novel 'Angels and Demons' created by American journalist and writer D. Brown. The innovative aspect of the research is closely connected with the studying of a new subgenre of the detective stories prose – the conspiracy novel. When constructing the artistic world view of the novel, the author creates his own reflection of it. These characteristics mirror the writer's world view. The artistic world view is characterized by the genre of a story, the author's world view, the individual artist style, the time of creating of the story and its theme. The artistic world view of the novel 'Angels and Demons' constructed on the opposition of religious and scientific spheres. The writer is an outstanding representative of post-nonclassical period of the development of science. The period when irrational and rational methods are combined in order to discover the nature of our world. Therefore, these peculiarities help the author to create an exceptional artistic world view in his novel. The opposition

and combination of religious and scientific spheres within the artist world view generates interest in studying this novel from the linguistic part.

Keywords: *artistic world view, world view, conspiracy novel, duality, individual artist style.*

The study of the artistic world view is one of the leading trends of philology nowadays. The term 'artistic world view' was firstly used by B.S. Meilach. In the contemporary linguistics, such synonyms like 'artistic world model', 'artistic world image' and 'artistic reality' are also used to replace this notion. But only 'artistic world view' in comparison with the term 'artistic reality' has to reveal cognitive possibilities of the art and the depth of understanding of the objective reality. The works of l. P. Grunina, Juri Lotman, B.S. Meilach are devoted to the study of the artistic world view. The artistic world view is characterized by the genre of a story, the author's world view, the individual artist style, the time of creating of the story and its theme [1].

Taking into account the genre of this novel, a new subgenre of the detective stories prose – the conspiracy novel should be mentioned there. This term was firstly used by Bulgarian-French structuralist literary critic – Tz. Todorov. In his work, he suggested the term 'roman à énigme' (conspiracy novel) [2]. There is a major difference in the plot structure of the conspiracy novel and the classical detective story. In comparison with the classical detective story structure, the conspiracy novel contains conspiracy theories. That's why the reader is not interested in searching for a criminal but has the feeling of involvement into a global conspiracy, and it keeps the reader even after having finished reading the story. The conspiracy novel 'Angels and Demons' created in 2002 by famous American journalist and writer D. Brown attracts a great interest because this literary work reflects a unique artistic world view in the new subgenre of detective stories. The novel could be characterized as 'a mix' of myth, thriller and a detective story.

The artistic world view becomes for an author that very place to create his artistic world view. From the cognitive aspect, artistic world view may be considered as one of the author's methods to present his own understanding of the world. Brown's novels include historical themes and Christianity as recurring motifs, and as a result, have generated controversy. Thus, a large number of priests and religious representatives met his works with hostility. In response, Brown states on his website that his books are not anti – Christian. He adds that he is on a 'constant spiritual journey' himself. D. Brown considers his book The 'Da Vinci Code' 'an entertaining story that promotes spiritual discussion and debate' and suggests that the book may be used 'as a positive catalyst for introspection and exploration of our faith' [3]. The desire *to explore the faith* creates a contradiction. Science and

religion have been two opposed spheres in all the cultures around the world for a long time.

The artistic world view is always regarded as a part of a general world view. The artistic world view reflects the features of the author's world view. The childhood, the family and the time of birth influenced the writer's world view formation greatly. Dan Brown was born and raised in Exeter, New Hampshire, USA [3]. He grew up on the campus of Phillips Exeter Academy where his father was a teacher of mathematics. His mother was serving as a church organist. Both of Brown's parents were also musicians and served as church choir masters. Brown was raised as an Episcopalian.

Brown's interest in secrets and puzzles stems from their presence in his household as a child, where codes and ciphers were the lynchpin tying together the mathematics, music and languages in which his parents worked. The young Brown spent hours working out anagrams and crossword puzzles, and he and his siblings participated in elaborate treasure hunts devised by their father on birthdays and holidays [4]. The interest for conspiracy theories and secrets must have begun that very time. On Christmas, for example, Brown and his siblings would not find gifts under the tree, but would follow a treasure map with codes and clues throughout their house and even around town in order to find their hiding place.

The main character of this novel is Robert Langdon – a professor of symbology at Harvard University. He is flown to CERN to help to investigate the murder of Leonardo Vetra – a scientist working there,

'Leonardo was a Catholic priest,' Kohler said. Langdon turned. 'A priest? I thought you said he was a physicist.' 'He was both. Men of science and religion are not unprecedented in history. Leonardo was one of them. He considered physics God's natural law. He claimed God's handwriting was visible in the natural order all around us… He considered himself a theo-physicist.' [5, p. 63]. From this example, one can understand that the sphere of activity of the characters in the novel is based on the opposition between science and religion. Leonardo Vetra was a scientist at the scientific center in Switzerland, but he was also a Catholic priest. Robert Langdon is a professor, but, at the same time, he is interested in a religious symbology.

The physicist was murdered, his chest branded with an ambigram of the word 'Illuminati'. Illuminati in the novel is a milestone secret society. Many great minds considered themselves as members of this secret society. For example, '…yes, Galileo was an Illuminatus. And he was also a devout Catholic. …. He held that science and religion were not enemies, but rather allies – two different languages telling the same story, a story of symmetry and balance…heaven and hell, night and day, hot and cold, God and Satan.' [5, p. 51].

The main character Langdon visiting CERN in Switzerland regarded a scientific laboratory as a church. The image typical for a religious sphere (cathedral, religion) is used in a scientific context and thus acquires other sense characterizing the value of physics for the scientific society. The laboratory building is presented as the Glass Cathedral. The science of physics is like the religion there,

"He had a fond love of architecture. '*The Glass Cathedral'*, the escort offered. 'A *church*?'

'Hell, no. A church is the one thing we don't have. *Physics is the religion* around here.' [5, p. 35] .... *The Glass Cathedral,* Langdon mused, gazing upward toward heaven." [5, p. 37];

The members of conspiracy society Illuminati compared churches with the altars of science '…The Illuminati called these four churches by a very special name. *The Altars of Science*' [5, p. 210];

According to the novel plot, someone has stolen the antimatter from CERN. The antimatter is a substance with destructive power comparable with the nuclear weapon. After the scientific center in Switzerland Langdon and Vittoria Vetra, the adopted daughter of Leonardo Vetra, went to the Vatican. The inner structure of the Catholic Church is described in detail.

One of the basic features of Brown's artistic world view created in the novel is that this novel is based on the opposition of religious and scientific spheres. The writer is an outstanding representative of post-nonclassical period of the development of science. The period when irrational and rational methods are combined in order to explore the environment. The text of the novel is based on the eternal contradiction of science and religion as two opposed spheres of human life. Scientists and religious representatives are fighting for so called 'absolute truth'. In science truth can be discovered, disproved or proved. On the contrary, in religion you ought to believe. Therefore, the title of the novel reflects duality, *Angels and Demons*, who do you stand for? The concept TRUTH, due to its historic formation features, reflects scientific and religious truths at the same time with distinctive feature – the absence or the presence of the definite article "the". That's why a lexical unit with the definite article denotes 'scientific truth' that can be found and proved. And a lexical unit without the definite article denotes 'absolute truth' [6, p. 8]. The precedential world created by D. Brown in his novel reflects the individual artist style. The text is a place for the realization of the author's intention. For realization intertextual action the existence of two texts is obvious – the original text and the receiver (recipient) one. Among the original texts, there are such texts as precedential ones. They have not lost their relevance from the moment of their creation. The Bible, classical literature, scientific works and others can be mentioned there [7].

For example, '…you're telling me that CERN dug out millions of tons of earth just to smash tiny particles? Kohler shrugged. *Sometimes to find truth, one must move mountains*' [5, p. 77]. From one hand, the lexeme *truth* means absolute truth. The phrase *one must move mountains* is a shifter of a biblical precedential expression *faith no doubt moves mountains*. From the other hand, the lexeme *truth* combined with the verb *to find* is typical for a scientific communication. The context describes the situation from a scientific sphere and connected with scientists' research work. The search of truth is not mandatory in the religion, truth should be only trusted. So, these features reflect duality and raise doubts on the appreciation of the situation.

'He hoped to prove that *science and religion* are two totally compatible fields – two different approaches to *finding the same truth*.' [5, p. 89]. In this example science and religion serve as the method of finding the same truth. The lexeme *truth* reflects both religious and scientific spheres. The verb *to find* makes it complicated to understand which one of truths is mentioned there, scientific or religious one? The opposition of *science* and *religion* complicates readers' understanding of the type of truth is mentioned above.

'...*Science and religion* support *the same truth – pure energy is the father of creation.*' [5, p. 93]. The lexeme truth can be applied to both scientific and religious truth. In the phrase *pure energy is the father of creation, pure energy* characterizes a scientific notion and *the father of creation* reflects religious aspect and symbolizes God as the godfather to humanity (*The Father of Creation, The Creator* and etc.). The use of the phrase from a small letter *the father of creation* connects this notion with scientific truth, limited with human mind, thus reflecting immediate participation of the Creator in a human life.

In conclusion, the artistic world view becomes for the writer that very place for the creating and realization of his author's intention. The artistic world view is always regarded as a part of a general world view. In analyzing the artist world view of a novel, the genre of a story, the author's world view, the individual artist style, the time of creating of the story and its theme are the basic characteristics of this structure. The artistic world view reflects the features of the author's world view. The childhood and the surrounding produce a great impact on the writer's world view. The author's world view is an inevitable part of the artist world view. The author creates his own reality with the help of lexical units. The reader perceives hidden senses and reproduces his own realization of the writer's intention. The artistic world view of 'Angels and Demons' was created in the time of post-nonclassical period of the development of science. The childhood and the teen age influence the author's world view greatly. D. Brown was surrounded by codes and ciphers in his family. During his studies he was interested in the history of arts, particularly the artworks and life of Leonardo Da Vinci. The genre of the

conspiracy novel helps the writer to shift readers' focus from the search of a criminal to the secret conspiracy societies. The lexical realization of the opposition and combination of religious and scientific spheres in the artistic world view mirror the author's world view, thus confusing the reader's appreciation of the religious representatives and scientists.

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梵语分词的使用特点及其俄语翻译（根据《博伽梵歌》文本）
FEATURES OF THE USE OF PARTICIPLES IN SANSKRIT AND THEIR TRANSLATION INTO RUSSIAN (BASED ON THE TEXT OF THE BHAGAVAD GITA)

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抽象的。本文讨论了梵文《博伽梵歌》文本中分词的使用特点以及这些结构的俄文翻译模式。为了进行比较分析，还考虑了将《博伽梵歌》翻译成英文的情况。根据比较分析的结果，可以确定在梵语中，与大多数古代印欧语系一样，并列比合意更胜一筹，因此更多地使用由分词短语复杂的简单句来代替复杂句。古典梵语有一个广泛的分词形式系统，涵盖了整个时态和语音范式：现在、过去和未来。过去分词以四种形式呈现，使用频率最高：不定过去时（主动和被动）和完成时（主动和中位）。在将不定过去分词和完成分词翻译成俄语时，有时会混淆它们的含义，因为现代俄语只有一种过去时形式。古典梵语中的分词短语经常与 Sandhi 结合使用，有时与分词短语结合使用，以表示附加动作。

关键词：梵文、分词、半表语结构、《博伽梵歌》。

Abstract. This article discusses the features of the use of participles in the text of the Bhagavad Gita in Sanskrit and the patterns of translation of these constructions into Russian. For comparative analysis, the translation of the Bhagavad Gita into English is also considered. Based on the results of a comparative analysis, it was possible to establish that in Sanskrit, as in most ancient Indo-European languages, parataxis prevailed over hypotaxis, therefore, instead of complex sentences, simple sentences complicated by participial phrases were more often used. Classical Sanskrit had an extensive system of participial forms that covered the entire tense and voice paradigm: present, past and future. The past participles, which were presented in the form of four forms, had the highest frequency of use: aorist (active and passive) and perfective (active and medial). When translating aorist and perfect participles into Russian, sometimes there is a confusion of their meanings, since modern Russian has only one form of the past tense. Participial phrases in classical Sanskrit were often used in conjunction with sandhi, sometimes in combination with participial phrases in the sense of an additional action.

International Conference

Keywords: Sanskrit, participles, semi-predicative constructions, Bhagavad Gita.

The Bhagavad Gita is rightfully considered one of the most studied and most translated texts in the history of world literature. Appearing in post-Vedic India, it has left its mark as a standard, almost universal work of the Hindu tradition. It also interested and eluded translators outside of India for more than two centuries. Some are fascinated by her contribution to the development of linguistics; others are interested in understanding the many philosophical and religious implications of this work. Part of the Gita's appeal as a foundation, in India and abroad, lies in its multivalent quality: it clearly promotes numerous teachings, some of which appear to be contradictory, and has been used in support of various others that have arisen since its composition. It has been interpreted in all sorts of interpretative modalities, most of which can be considered more or less authentic and legitimate.

In Sanskrit, as in most ancient Indo-European languages, parataxis prevailed over hypotaxis, therefore, instead of complex sentences, simple sentences complicated by participial phrases were more often used. Here are some examples of this use of participles in the text of the Bhagavad Gita.

1. O Sanjaya, what did my sons and the sons of Pandu do when they gathered in the sacred place, Kurukshetra, desiring battle? [2, 1.1.]

धर्मक्षेत्रे कुरुक्षेत्रे dharmakṣetre kerekṣetre
समवेता युयुत्सवः। सामावेता yuyutsavaḥ
मामकाः पाण्डवाश्चैव māmakāḥ pāṇḍavāś cāiva
किम् अकुर्वत संजय ॥ Kim akuruvata saṁjaya [3, p. 73]

In the line "समवेता युयुत्सवः। **samavetā** yuyutsavaḥ" the first word is the past participle (aorist) of the passive voice in the form of the nominative masculine plural, fully consistent with the adjacent substantivized adjective meaning "thirsty to fight, willing to fight". Thus in the Sanskrit text we have a semi-predicative participial phrase replacing the clause of tense, which was quite common in Sanskrit, since this ancient language tending to synthetism in such cases showed the predominance of parataxis over hypotaxis, like most ancient languages. Translated into Russian and English, in this place there is an adverbial temporal construction introduced by the subordinating conjunction "when": "When they were in the field of virtue, in the field of the Kurus, Assembled together, desiring to fight, What did my army and that of the Sons of Pandu do, Sanjaya?" [3., p. 73].

2. "O teacher, look at this great army of the sons of Pandu, skillfully built by the son of Drupada, your able student!" [2, 1.3.]

पश्यैतां पाण्डुपुत्राणाम्   paśyaitāṁ pāṇḍuputrāṇām
आचार्य महतीं चमूम् ।   ācarya mahatīṁ camūm
व्यूढां द्रुपदपुत्रेण   **vyūḍhāṁ** rdupadaputreṇa
तव शिष्येण धीमता ॥   tava śiṣyeṇa dhīmatā [3., p.75]

In the Sanskrit example in the third line, the past participle (aorist) of the passive voice in the form of the accusative case of the feminine gender is used in the function of the coordinated definition, which almost completely (except for the gender) corresponds to the form of the Russian translation. Aorist participles in Sanskrit were among the most common participial forms and were characterized by syntactic and semantic multifunctionality, like similar past participles in Russian.

3. Then Arjuna, whose banner depicts Hanuman, looked at the sons of Dhritarashtra, lined up in battle array, and raised his bow, preparing to shoot [2, 1.20]

अथ व्यवस्थितान् दृष atha vyavasthitān dṛṣṭvā
धार्तराष्ट्रान् कपिध्वजः । dhārtarāṣṭrān kapidhajaḥ
प्रवृत्ते शस्त्रसंपाते pravṛtte śastrasaṁpāte
धनुर् उद्यम्य पाण्डवः ॥ dhanur udyamya pāṇḍavaḥ [3, p. 58]

Participial phrases in Sanskrit, as a rule, were not separated into separate constructions. Since word order was free, as in most synthetic languages, this construction demonstrates the superposition of participial and participle constructions. The adverbial participial phrase includes components that are in different lines: व्यवस्थितान् "vyavasthitān" + धार्तराष्ट्रान् "dhārtarāṣṭrān" "the sons of Dhritarashtra lined up in battle formation" and adverbial participial phrase अथ दृष "atha dṛṣṭvā" "Then seeing".

4. Due to the mixing of estates, the entire clan and the destroyers of the clan are plunged into hell; their ancestors will fall, deprived of the memorial offerings of food and water [2, 1.42]

संकरो नरकायैव saṁkaro narakāyāiva
कुकघ्नानां कुलस्य च । kulaghānāṁ kulasya ca
पतन्ति पितरो ह्येषां patanti pitaro hyeṣāṁ
लुप्तपिण्डोदककिया: ॥ luptapiṇḍodakakriyāḥ [3, p. 80]

The past participle of the passive लुप्त "lupta" "devoid" in the sandhi लुप्तापिण्डोद–कक्रियाः "luptapiṇḍodakakriyāḥ" is a classic case of a common participial definition.is a classic case of a common participial definition.

5. And we heard from the scriptures, O Janardana, that people who violate the tribal laws are plunged into hell for a long time [2, 1.44]

उत्सन्नकुलधर्माणां utsannakuladharmāṇāṁ

मनुष्याणां जनार्दन। manuṣyāṇāṁ janārdana

नरके ऽनियतं वासो narake 'niyataṁ vaso

भवतीत्यनुशुश्रुम ॥ bhavatītyanuśuśruma [3, p. 82]

In this case, the participial turnover is represented by one large conjunction उत्सन्नकुलधर्माणां "utsannakuladharmāṇāṁ" "traversing generic laws", where the past participle itself is उत्सन्न.

6. Then Madhava and Arjuna, **standing** in a majestic chariot drawn by white horses, blew their divine conch shells [2, 1.14].

ततः श्वेतैर् हयैर् युक्ते tataḥ śvetāir yukte

महति स्यन्दने स्थितौ । mahati syanane sthitāu

माधवः पाण्डवश्चैव mādhavaḥ pāṇḍaścāiva

दिव्यौ शङ्खौ प्रदध्मतुः ॥ Divyāu śaṅkhāu pradadhmatuḥ [3, p. 52]

Here we see the past participle of the passive voice युक्ते "yukte" "harnessed" in the form of the locative case as part of a common definition expressed by the participial phrase. This is well reflected in both Russian and English translations:

"Then, standing in the great chariot Yoked with white horses, Krishna and Arjuna Sounded forth their divine conch horns" [3, p. 52].

7. When Arjuna saw his relatives gathered together, he was filled with compassion and said, lamenting [2, 1.27.]

श्वशुरान् सुहृदश्चैव śvaśurān suhṛdaścāiva

सेनयोर् उभयोर् अपि। senayor ubhayor api

तान् समीक्ष्य स कौन्तेयः tān samīkṣya sa kāunteyaḥ

सर्वान् बन्धून् अवस्थितान् ॥ Sarvān bandhūn avasthitān [3, p. 65]

Here is a participial phrase with the past participle of the passive voice अवस्थितान् "avasthitān" together with dependent words forms the participial phrase

"lined together in a row". In our opinion, the English translation of this passage is somewhat closer to the original than the Russian one:

"Arjuna saw fathers-in-law, companions, In the two armies, And contemplated All his kinsmen, arrayed" [3, p. 65]

8. I want to see those who have gathered here to fight, desiring to please the wicked son of Dhritarashtra [2, 1. 23]

योत्स्यमानान् अवेक्षे ऽहं yotsyamānān averṣe 'haṁ

य एते ऽत्र समागताः। ya ete 'tra samāgatāḥ

धार्तराष्ट्रस्य दुर्बुद्धेर् dhārtāṣṭraya durbuddher

युद्धे प्रियचिकीर्षवः ॥ yuddhe priyacikīṣavaḥ [3, p. 83]

In this passage, you can see an example of the use of the future participle of the active voice, which conveyed the intention to perform an action योत्स्यमानान् "yotsyamānān" "those who are going to fight".

This form was not widely used in Sanskrit texts. The future participle with the meaning of the intention to perform an action is not widespread in the languages of the Indo-European family, although in some ancient languages, for example, in Latin, similar forms are found. In Russian, this form does not have a synthetically expressed analogue, therefore, in translation it is often replaced by a subordinate attributive construction.

Conclusions

Based on the results of a comparative analysis of the use of participles in the text of the Bhagavad Gita and its translations into Russian and English, the following conclusions can be drawn. Classical Sanskrit had an extensive system of participial forms that covered the entire tense and voice paradigm: present, past and future. The past participles, which were presented in the form of four forms, had the highest frequency of use: aorist (active and passive) and perfective (active and medial). When translating aorist and perfect participles into Russian, sometimes there is a confusion of their meanings, since modern Russian has only one form of the past tense. Sanskrit present and future participles had three voices: active, medial and passive (six forms in total). The participles of the active voice of all tenses were declined according to the mixed type of adjective declension (m. and n. gender - according to the consonant type on –t, f. gender – according to the vowel type on –ī); participles of the passive and medial voices changed according to the vowel type of adjective declension into –ā. Aorist participles were often used in a sentence instead of a conjugated verb form as a predicate. The passive participle of the future tense has the meaning of obligation [1, p. 198]. Participial phrases in

classical Sanskrit were often used in conjunction with sandhi, sometimes in combination with an adverbial participial phrase in the sense of an additional action.

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信息时代媒体文化作为整合系统的传播策略
COMMUNICATIVE STRATEGY OF MEDIA CULTURE OF THE INFORMATION AGE AS AN INTEGRATING SYSTEM

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抽象的。 本文探讨了作为信息时代整合系统的媒体文化的传播策略。 同时，不仅揭示了其在 XX–XXI 世纪之交的特殊性和发展过程，而且还揭示了将媒体文化分析为全球化世界现象的跨学科方法。 作者证明了将媒体文化作为一门综合科学进行研究的可能性尚未耗尽，因为今天是她在引领媒体人作为新历史文明的人格形成的过程。
关键词：媒体文化； 信息时代；沟通；沟通策略； 综合概念，集成系统。

Abstract. *The article deals with the communicative strategy of media culture as an integrating system of the information age. At the same time, not only its specificity and development processes at the turn of the XX-XXI centuries are revealed, but also an interdisciplinary approach in the analysis of media culture as a phenomenon of the globalized world. The author proves that the possibilities of studying media culture as a synthetic science have not yet been exhausted, since today it is she who leads in the process of forming a media person as a personality of a new historical civilization.*

Keywords: *media culture; information age; communication; communication strategy; synthetic concept, integrating system.*

Introduction

Each era gives rise to new leading forms of culture, which are the most in demand by society. The information age, conditioned by the formation of the global media environment, actualizes the idea of E. Toffler about new parameters of the structure of society, "based not on wealth or violence, but on the intellect and knowledge that information provides" [Toffler, 2003, p. 8]. In this regard, the leading role of media culture in the modern "knowledge society" is a real fact.

The terms "media" (from Latin medium - means, intermediary) and "media culture", introduced by the Canadian sociologist G.M. McLuhan in the second

half of the 20th century, were originally used by researchers to analyze mass (replicated) culture and as a new communicative concept. At the same time, his research is especially relevant and significant as one of the first media theorists. McLuhan devoted his main works to the analysis of communication channels in culture and explored the daily life of a person in the information society, a world created by the latest mass media [McLuhan, 2003, 2005].

The contribution to the study of the phenomenon of media culture at the turn of the XX-XXI centuries was made by the works of both foreign (T. Adorno, A. Bazin, R. Barthes, V. Benjamin, J. Baudrillard, N. Bolz, J. Deleuze, G. Marcuse, M. Castells, N. Luhmann), and Russian (M. Bakhtin, L. Vygotsky, Yu. Lotman, V. Bibler, K. Razlogov, M. Yampolsky et al.) researchers. The works of these authors are basic studies of media culture as a new paradigm of the information age.

The purpose of this article is to analyze the communicative strategy of media culture as a synthetic concept, which makes it possible to comprehensively explore the features of the media sphere and the evolution of media culture as "a set of information and communication tools developed by mankind in the process of its historical development, influencing the formation of public consciousness and the process of socialization of the individual [Kirillova, 2022, p. 17].

Research results

McLuhan's cultural typology, as you know, turned the whole official theory of culture upside down. McLuhan did not draw a dividing line between "mass" and "elite" cultures, but focused on the loss in the XX century of humanistic ideals, the enlightenment illusions of the past. He taught to look at media culture without contempt, with attention to this new "hybrid" (technology and creativity) of the information age.

McLuhan perceived technical innovations as metaphors: "All means of communication are active metaphors"; "Media language, like any other language, is a technology"; "Being an artist means managing metaphors" [McLuhan, 2003]. McLuhan was the first researcher to note, back in the early 1960s, that new technologies had led to an "information explosion" [ibid., p. 5], thanks to which the world has turned into a "global village" [ibid., p. 7].

The book of Roland Barthes "Mythologies" is also devoted to the analysis of the influence of media culture on public consciousness. True, instead of the term "media" the researcher uses the definition "modern myths"; moreover, in his understanding, the myth loses the function of interpretation and acquires the ability to disguise ideology. Barth's myths serve not to resolve social contradictions, but to "naturalize" them, which makes it possible to see some duality in the use of the word "myth" and perceive the media sphere as a media shell of "mythological reality" [Bart, 2008, p. 233-234].

Media culture, therefore, is not only a communicative, broadcasting channel built on the ideological, emotional and even subconscious expectations of the audience, but also an environment in which "cultural codes are produced, aestheticized and broadcast" [Savchuk, 2001, p. 25]. This is the synthetic basis of media culture as the relationship between technology and creativity, communication and ideology. Moreover, the communication (from Latin communication – message, transfer) strategy is decisive, since "along with general scientific significance, it acquires a sociocultural meaning associated with the specifics of information exchange in society" [Istoricheskaya culturologiya, 2015, p. 313]. There are three approaches to explaining this phenomenon: the first is really connected with the communicative side of media culture; the second gives the media a leading role in the implementation of social functions; the third is semiotic, due to which media culture is considered as a language, as a system of symbols and signs.

Media culture is a complex concept, it is not only a system of mass communication, it is technologies or "intermediaries" that make significant changes in a person's communication with the outside world, reorganizing the ways of his perception of the world and forming a "picture of the world".

And although in the modern sense, media culture combines all types of print, auditory, visual and audiovisual media, audiovisual information comes to the fore, the hypertrophy of which was noted not only by G.M. McLuhan, but also J. Baudrillard, N. Bolz, N. Luhmann, K. Razlogov and others. In their opinion, the media sphere is an area of culture associated with the transmission of dynamic images that have become widespread using the latest technical means (we are talking not only about cinema, television, video, but also multimedia products, cellular communications, computer channels, social networks, etc.).

The specificity of media culture as a synthetic concept is determined by its semiotic nature and the technical capabilities of the means of its implementation: high information capacity, ease and persuasiveness of sensory (figurative) perception, the dominance of productive possibilities over reproductive ones, the speed and breadth of broadcasting and replication, mass character and accessibility, form the social functions of media culture: information, communication, relaxation, normative (ideological), creative, aesthetic, integration, mediation.

From a semiotic point of view, media culture appears in three main aspects: as a system of artifacts (from Latin arte - artificial and factus - made), as a system of symbols and signs. And "any system that serves the purposes of communication," Yu. M. Lotman argued, "can be defined as a language" [Lotman, 1998, p. 18-19]. Applying the methods of linguistics in the study of the language of works of art, Lotman, as you know, proved that any cultural phenomena should be considered as texts containing information and meaning. Since the text is a multi-valued concept, from the point of view of modern media culture, it means not only a written

message (book, newspaper or magazine article), but also any information carrier. For example, a movie, TV or video film, comic book, TV program, video clip, Internet site, etc.

The language of media, like the media text, has gone its own way of evolution. It is known that G. M. McLuhan identified four epochs in the history of human civilization, and hence in the history of media culture: 1) the era of preliterate barbarism; 2) a millennium of phonetic writing; 3) "Gutenberg Galaxy" - five hundred years of printing technology [McLuhan, 2005]; 4) "Marconi Galaxy" (electronic civilization). The fifth item on this list was the definition of the sociologist M. Castells "Galaxy of the Internet" [Castells, 2004].

Different media arose each time as a way to fulfill the two most important human needs: they promised greater freedom of choice and communication in the world around. Today, new (digital) media increasingly perform the function of an integrator of a large-scale media environment.

However, the mass nature of modern media culture does not prevent it from performing an aesthetic function, periodically giving samples of "high art" to humanity. Moreover, the aesthetic potential of media culture makes it possible to reveal its semiotic basis. The specifics of media culture are signs and sets of signs (texts) in which social information is encrypted, i.e. the content and meaning embedded in them. To understand this or that phenomenon of media culture means to "read" its invisible subjective meaning. Only a meaningful text becomes a fact of culture [Lotman, 1998, p. 5].

According to the theory of M. M. Bakhtin, the text is then dialogic when it has a support: the "unity of consciousness" of the author and the consumer, the subject of influence. Only in this case is a dialogue possible that guarantees the truth of a certain ideology [Bakhtin, 2017, p. 384]. And according to Yu. Kristeva, the text is polyphonic, it does not have its own ideology. "This special device is a platform where different ideologies come out to bleed each other in confrontation" [Kristeva, 2004, p. 21]. It should be noted that the works of Y. Kristeva became a sensation in their time also because she enriched media theory by introducing the terms "hypertext", "genotext", "intertext", "phenotext" into semiotics, which are linguistic mechanisms of integration.

Another important detail: the texts of media culture, "codifying reality", preserve social memory. At the same time, each group of types of media culture has its own sign system. But in order for the sign system to function, a code is needed as "a designation of a set of rules or restrictions that ensure activity" [Social Philosophy, 2018, p. 147].

The synthetic basis of media culture makes it possible to see the differences between written, auditory, visual and audiovisual sign systems.

The fundamental principle here is writing, a system of recording signs of natural language, oral speech. The invention of sign systems of notation is one of the

greatest achievements of human thought. Writing, as you know, opened the way to the reproduction of texts - printing, and it, in turn, became a condition for the preservation of linguistic traditions and the continuity of the existence of culture.

The *letter* became the sign of written culture, and the *note* became the sign of auditory culture. Traditional visual arts (painting, graphics, posters) are dominated by iconic sign systems.

Audiovisual (screen) media culture, reproducing reality, is associated, as L. Delluk argued, with "photogeny" - the aesthetics of the frame [Delluk, 1924]. This property is not only photography, but also the most effective audiovisual means of communication - cinema, TV, video, computer graphics, animation, social networks, etc. Here there is a process of integration, synthesis of all previous sign systems, also due to the fact that new types of media culture each time are a derivative of technical progress.

Understanding the figurative potential of audiovisual arts is connected with the understanding of the frame not as an element of montage, but as its cell. In the end, this led to the formation of that new way of figurative thinking, which was most adequate to the new vision of reality, which spread through the use of the aesthetics of an instant photo frame. It is no coincidence that S.M. Eisenstein saw in the screen way of reproducing reality that technical "first phenomenon", on the basis of which the poetics of screen culture arose, facing history, capable of helping viewers learn to "dialectically think" [Eisenstein, 1956, p. 199].

Thanks to the transformation of the language of media culture in the digital age, the process of synthesis of modern humanities is underway and their new media equivalents are emerging ("digital humanities", "media pedagogy", "online education", "media aesthetics", etc.), testifying to the actual innovations of media culture as an integrating system of the information age.

Conclusions

Summing up the analysis of the communicative strategies of media culture as an integrating system of the information age, we can conclude that media culture is not only a synthesis of technology and creativity, which includes the culture of production and transmission of information, as well as the culture of its perception; it is also an indicator of the level of development of a person who is able to "read", analyze and evaluate media text, engage in media creativity, acquire new knowledge through the media, which today is an important factor in the ideological and educational system. At the same time, it should be borne in mind that the development of media culture in a globalized world is a historically determined process, natural from the point of view of the theory of evolution.

The possibilities of studying media culture and its integration with other humanities have not been exhausted, since in the XXI century it is a kind of "loco-

motive" in the process of forming a humanistic personality as a phenomenon of a new historical civilization.

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美国主导亚太和东南亚国家政策的结果：谢尔盖拉夫罗夫和南希佩洛西的飞行
THE RESULTS OF THE POLICY OF AMERICAN DOMINANCE IN THE ASIA-PACIFIC AND SOUTHEAST ASIAN COUNTRIES: THE FLIGHTS OF SERGEY LAVROV AND NANCY PELOSI

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抽象的。 在拟议的文章中，作者评估了世界主要大国在亚太地区日益加剧的集团对抗的风险，这些大国正试图确定经济未来并形成能够接受全球多中心政策的新精英 秩序并创建一个数字和军事基础设施，以平衡对这一进程感兴趣的所有国家的利益。
关键词：SV Lavrov、Nancy Pelosi、APR、NWO、多中心、多极、军事集团、AKUS、ANZUS、RCEP、核潜艇、俄罗斯、美国、中国、日本、台湾、韩国。

Abstract. *In the proposed article, the authors assess the risks of a growing bloc confrontation in the Asia-Pacific region of the world's leading powers, who are trying to determine the economic future and form a new elite capable of accepting the polycentric policy of the global world order and creating a digital and military infrastructure that balances the interests of all states interested in this process.*

Keywords: *S.V. Lavrov, Nancy Pelosi, APR, NWO, polycentricity, multipolarity, military bloc, AKUS, ANZUS, RCEP, nuclear submarines, Russia, USA, China, Japan, Taiwan, Korea.*

The SMO of Russia in Ukraine launched the processes of uncompromising confrontation between the West and the Axis countries of the colonial countries against the states that adopted the pro-Russian vector of development, changing the balance of power between the Atlanticists and the Heartland.

This agenda was proclaimed on December 15, 2021 by the President of Russia V.V. Putin from the position of revising the "red lines" of the North Atlantic Alliance, which, in 5 waves of its expansion, approached the borders of the Russian Federation with its infrastructure and made the continued existence of the Russian people, subject to direct and indirect external military threats and the total destruction of the Slavic ethnos, very probable and expected [1].

At the same time, the potential front for creating a bloc delimitation of the world is moving from the European continent, fading in its capabilities of the Old World, to the Asia-Pacific region, clarifying new theaters of military operations (TMO), previously formed by the United States under the guise of the Indo-Pacific strategy, which risks, like shagreen leather, to decrease to the Asia-Pacific block zoning. For development, since September 2021, from the standpoint of AUKUS, has not become a cradle for the latent or gradually promised accession of Japan to the matrix platform of the Eastern NATO being created, perplexed by the phantom pains of the revival of the former imperial power and eager to be included in technological cooperation with the United States, Great Britain and Australia, not only through the production of new nuclear submarines for the farthest continent, but also by attempts to scientific and technological inclusion in the register of unified certification and hosting of its technologies in the field of high-speed quantum calculations and elements of a hypersonic software-element set of components in products in V and VT of British-American gunsmiths. And the point here is not only the current Constitution of Japan and the creeping militarization of its self-defense forces strongly encouraged by the United States, and fastening them to the point of bilateral infrastructural growth along the corresponding axes: Japan-South Korea-USA, Japan-India-USA and Japan-Australia-USA, which have long established themselves in the research, defense and ICT industries. The point here is the ability to throw the puck into the middle zone and strike "accidentally", but pointwise and according to those desired priorities that are not customary to talk about, but the further development of the state, with its obvious military orientation, is hardly possible. Increasing dislike on the part of China even more, Japan begins a maneuver towards North Korean politicians, guaranteeing them "normalization of relations" in the event of abandoning the missile and nuclear programs, which Japanese Prime Minister Hirokazu Matsuno strengthens in his loyalty under the onslaught of the hysteria of American experts about allegedly preparing nuclear tests in Pyongyang. And Kim Jong-un proudly reports in July 2022 that he is ready for war with the United States itself, in case they threaten the

national security of North Korea. The United States itself is cleaning up and correcting its fading synergistic effects in the Indian quartet with Japan and Australia in the APR format, which, like the Quadrilateral Security Dialogue, has taken on strategic importance in balancing the aggravated Sino-American relations in the APR, but has not grown to the size of the new military bloc due to the neutrality of South Korea, which did not dare to such an obvious polarization of its foreign policy and direct confrontation with the PRC in collaboration with the Yankees under the Stars and Stripes flag. At the same time, the July 2022 NATO summit on the expected membership of Sweden and Finland gave Seoul the opportunity to think about its place in the ranks of the militant Atlanticists, as the victorious pro-American government, leading the Asian tiger, took time to consider her puzzle involvement in such an architecture and the risks of participating in an anti-Asian bloc structure [2].

After the provocative visit of the Speaker of the Lower House of the US Congress Nancy Pelossi to Taiwan in early August 2022, which had no analogues since 1997, all Asia-Pacific countries understood the peremptory desire of the United States to put the squeeze on the anti-China strategy in the region, as the only true and dominant over other thoughts about a more peaceful and polycentric world, so often discussed at the APEC or ASEAN summits, in anticipation of confirmation of its neutrality and unpreparedness for involvement in the upcoming showdown between the superpowers in the waters of the two oceans. And the search for the United States on the basis of AUKUS and within the Asia-Pacific region for allies to expand the zones of presence of the nuclear triad of strategic nuclear forces (nuclear deterrence forces) and new members of the nuclear club (otherwise, why would Australia need nuclear submarines capable of carrying nuclear charges without these charges?) as a formation of TMO preferences in the zone of Uncle Sam's growing strategic ambitions. At the same time, the status of "non-alignment" for the states of the region becomes an unattainable luxury, because the Soviet-American "cold war" ended in August 1991, and its new 2.0 format, announced by Joe Biden, does not imply a "third option" of non-participation, otherwise the resources of each of participants can be expropriated or mobilized through colonial ties to certain tasks of sprawling blocs of the past, such as ANZUS, for example, or can be attracted to trade and investment areas gravitating either to the United States or China, centers of future competencies and scientific laboratories of an all-consuming digital transformation. And this means that geoeconomics will determine both the choice of real sources of financing and the protection of protectionist clusters from bioresources to electronic component microcircuits and chips that guarantee their sovereign place to everyone in the MRT and in the MEO of Industry 4.0., tied geographically and to the markets for these products, and to the transfer of investment flows and to the technologies of

the new stages of the Marshall and Mac Arcturus plans for the post-war world order of the Asian industrial world. And the stagnation in these processes, or the sanctions impact on any high-tech industry, on each individual state of the region, will result in a fatal lag and growing unemployment of inflationary and industrial types, as hostages of the unfolding post-COVID translogistic production chains of TNCs of corporatocracy global governance. And the power of banksters and netocrats in these processes is difficult to overestimate, because the ideology of the evolutionary further growth of the most dynamic region of the planet will be determined not only by young and surplus labor resources and the wandering business practices of West-Eastern cooperative conglomerates, but will ultimately come down to a dilemma : who won in the confrontation between China and the United States? And the losers will pay their price, even a price that is unbearable for them, because the winner, as you know, takes everything ... It was these threats that Russian Foreign Minister S.V. spoke about. Lavrov during his tour of Asian countries in August 2022.

Therefore, the drift of states around the archipelagos of their own illusions about zones of a nuclear-free and pacifist-shaped space in the world ocean, as well as unrealizable dreams about the screens of bilateral treaties, not to tease the two leading players in this process, can lead to a departure from reality and not to the metauniverse of emerging ecosystems of business, leisure and flow management, but to the catastrophe of their own economic failure and complete colonial and currency dependence on the dominant players in the Asia-Pacific region.

Add to this the problem of the poorest player in the region of Afghanistan, re-surgent by the Taliban from the plagues of overseas democracy and occupation by the countries of the Western world and with the full support of the PRC, growing production costs with further consideration of the human factor during the onset of the 7th scientific and technological order of machine intelligence and big data bases, automation of production chains and the creation of cyborgs and robotics of the maximum level of efficiency. The parliamentary coup in Pakistan, which was carried out in the region, also did not do without the participation of American ideologists, who are trying to keep both India and Pakistan itself in the zone of their interests, manipulating their mutual contradictions and showing obvious failure in drawing them into the anti-Russian sanctions agenda, tireless fighters for democracy.

At the same time, formats other than ASEAN, such as the RCEP (Regional Comprehensive Economic Partnership), the Chamber of Commerce and Industry (Trans-Pacific Partnership) set multidirectional trends for the entire region and polarize countries from the standpoint of their priorities not only in choosing their place in the MRT or in setting national development goals towards China or America, but also make the political discourse itself and the proclaimed cross-country

content a platform for further concentration of contradictions that can blow up the Asia-Pacific region from the inside, put pressure on the Asian NATO, to the options of a world policeman, ready for anything, for the sake of his, fading before our eyes, hegemony of Anglo-Saxon global dominance.

In addition, according to the UN World Investment Report 2021 regarding the RCEP and APEC countries, one can see that with a large accumulated volume of bilateral investments, intraregional investments grow extremely slowly, and their share in the accumulated share of the regional product is not large, which indicates a low degree of interaction in the intraregional market. However, in Asia, the prospects for FDI are more positive as the region develops domestic supply and trade chains, making it less dependent on goods produced elsewhere in the world and less vulnerable to external shocks, contributing to the internal integration processes of various levels of clustering and the creation of a single space for exchange of goods and security. This is most relevant for the countries of East and Southeast Asia due to the fact that integration around the RCEP and ASEAN strengthens intra-regional ties, and the multidirectional nature of the Chamber of Commerce and other options for regional construction of the "One Belt, One Road" type, for example, creates precedents for an alternative development path and short bilateral contractual relations that reduce tension in the Asia-Pacific region. And here China, as the geographical and regional leader of this community of states, still holds unconditional superiority [3].

The consequences of Nancy Pelosi's trip to Taiwan will expose the real state of affairs and the relevance of the ephemeral doctrines that the superpowers profess, diverging from the trends of military exercises and propaganda moves that show not only China's responsibility for peace in the Asia-Pacific region, but also a clear regionalization between the priorities of the economy and the military response, which can take place no earlier than in 8 years, according to the fundamental documents of the Celestial Empire in the field of national security and stopping the risks of growing threats of further pulling the world into military bloc coexistence [4].

The role of Russia in this process remains significant, but requires more concrete steps, up to the continuation of military joint exercises with China in the South China Sea (SCS) and the creation of a network of naval military bases that guarantee security for the countries of the region, taking responsibility on the basis of the Code of Conduct in the SCS, which is close to being signed and ratified by the majority of players in the Asian Great Game. This pragmatic attitude in the field of financial counterweights to the Anglo-Saxon institutions of financial and credit expression of will could also be supported by Russian-Chinese jointly implemented initiatives within the framework of new institutions for the development of investment and project financing of infrastructure backlogs by the SCO

and BRICS, for example, through the Asian Infrastructure Investment Bank and the BRICS New Development Bank, which is growing in its projects [5].

Therefore, the consequences of "playing with fire" expected by the world will bear fruit [6], and in order for their consequences to be predictable and risks to be hedged, the agenda today should already have clear "road maps" and the convergence of scientific and technological Russian-Asian schools [7], dominant in matters of self-identification and self-sufficiency, in following the tasks of their future in the Asia-Pacific region and in choosing the exact historical and civilizational goal-setting in the formation of a global security system and the preservation of national priorities [8].

It has already become known that 8 areas of US-Chinese negotiations on the economy, investment, military cooperation, countering criminal exports, shadow transnational crime, supplies of components for alternative and "green" energy have been suspended. China is no longer paying attention to its earlier commitments to curb the construction of coal-fired power plants in Africa and the Middle East, is beginning to block any access to Taiwan for certain essential goods and for the production of chips, including, at the same time, he willingly participates in the International Military Games organized by Russia in Venezuela, consisting of 36 states and no longer considers himself bound by a strategic partnership with the current leadership of the White House. At the same time, Nancy Pelosi herself is included in the sanctions list for visiting mainland China, as an unreliable partner who does not enjoy loyalty and trust from the authorities of the Middle Kingdom.

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现代青少年的自我肯定问题
PROBLEMS OF SELF-AFFIRMATION
OF MODERN TEENAGERS

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注解。　这篇文章讨论了与现代青少年自我主张的形成有关的问题。　值得注意的是，在与现代青少年一起工作时，父母和教师应该考虑到他们在数字环境中认知、情感–意志和行为领域发展的特殊性。　确定影响青少年自我肯定的因素：家庭作为初级社会化的机构，心理健康，包括身体、精神和社会健康，以及学习条件和舒适的教育环境。　得出的结论是，最初的自我肯定是一种与生俱来的愿望，随后成为一个人意识到自己存在的价值的先决条件和结果，并通过将自己与他人进行比较来表达。

关键词: 青少年、自我肯定、自我发展、舒适的教育环境、教师、家长、发展。

Annotation. *The article deals with issues related to the formation of self-assertion of modern teenagers. It is noted that when working with modern teenagers, parents and teachers should take into account the peculiarities of the development of their cognitive, emotional-volitional and behavioral spheres in the context of the digital environment. The factors influencing the self-affirmation of adolescents are identified: the family as an institution of primary socialization, psychological well-being, including physical, spiritual and social health, as well as learning conditions and a comfortable educational environment. It is concluded that initially self-affirmation acts as an innate desire, which subsequently becomes both a prerequisite and a result of a person's awareness of the value of his being, expressed in comparison of himself with others.*

Keywords: *teenager, self-affirmation, self-development, comfortable educational environment, teacher, parent, development.*

Modern teenagers are a special category of representatives of the younger generation. First, they can be characterized as digital natives, characterized by spe-

cific features of the development of cognitive, emotional and behavioral spheres. Therefore, parents, educators and other adults should take this fact into account in the process of interacting with a modern teenager. In addition, the role of mass media in the process of socialization of the younger generation is obvious. Secondly, the formation of self-awareness, the system of values, needs and interests of modern adolescents largely depend on Internet communication, which is both a means and an environment for the social development of the individual. Modern teenagers in the information environment do not act as passive observers, but actively build an image of their own I in the real and virtual worlds. However, despite the changes taking place in almost all spheres of human life, issues related to the development and self-development of the individual remain relevant at all stages of development. Undoubtedly, one of the main aspirations of the individual is the desire for self-affirmation. Self-affirmation characterizes the individual's awareness of his uniqueness and originality, and it is most clearly manifested in adolescence.

In psychological science, A. Adler is considered the creator of the psychological theory of self-affirmation of the personality, who argued that people always strive for superiority (self-affirmation). Such a desire is innate, it is the law of human life, it is "something without which human life cannot be imagined" [5]. Depending on the intellectual level, the self-affirmation of modern adolescents is often destructive, manifesting itself in such forms as nihilism, demonstrativeness, irony, selfishness, aggression, lies, infantilism, passivity, comfort, bravado. We agree with G.V. Dorzhieva, who considers self-affirmation through the prism of need, and defines self-affirmation as: "the desire to realize one's Ego, the strength of one's "I" is the leading need for gifted and ambitious people in professional and personal development" [1].

Based on the foregoing, in this article we have made an attempt to analyze the problems associated with the self-assertion of modern adolescents. In our opinion, the factors influencing the self-affirmation of adolescents are the family as an institution of primary socialization, psychological well-being, including physical, spiritual and social health, as well as learning conditions and a comfortable educational environment.

As you know, the leading activity in adolescence is communication with peers. During this period, educational activities fade into the background, the preferences of adolescents change towards their own kind. The main conflict is associated with the emergence of a sense of adulthood, a teenager demands to be treated by parents and adults as an equal. However, the teenager himself is not yet ready to behave like an adult, so very often misunderstanding on the part of parents and adults leads to distance in communication, isolation and secrecy. In this context, the position of parents and teachers is important, the totality of their actions will

allow developing the gullibility and openness of adolescents. It is important to avoid double standards when adults declare norms and values that they themselves do not adhere to.

In modern Russian society, adolescents are among the least stable and protected social groups. At the same time, it should be emphasized that adolescence is a period in which the interaction of the child's inner world and the social environment is most vivid and problematic. It is the teenager who is extremely saturated with internal conflicts and difficulties: a break with the standards and norms of behavior that have developed in society; the desire to escape from reality due to unsuccessful attempts to adapt to the socio-cultural environment; preference for the virtual world over live communication.

Psychological well-being reflects a person's ability to live safely in a real environment (natural, man-made, social). An indicator of the psychological well-being of a teenager is his social interaction in society, leading to positive transformations, to understanding and accepting the norms and values of the socio-cultural environment.

A comfortable educational environment created at school is a set of conditions for effective collaboration of the "teacher-student-parent" system. Therefore, the development of the educational environment affects the development of each subject of the educational process. It should be noted that in psychological and pedagogical research, enough attention has been paid to the problems of forming a developing environment. We are close to the ideas of V.V. Rubtsov, who points out that a comfortable educational environment implies "the development of a child as a process of mastering the multidimensional and versatile tools inherent in various forms of consciousness and activity, which allows us to consider the space of this type of school as a space of opportunities for mastering social norms as cultural and historical norms" [four]. At the same time, it should be added that at the present stage of development of the educational environment, the teacher's functions are supplemented with new options. The development of the information environment requires the teacher to be able to orient the teenager in a wide information field, helping him to differentiate the knowledge gained in accordance with topics and directions. The main principle of a comfortable educational environment is the cooperation of students, teachers and parents, which creates conditions for productive assistance based on the principles of humanity.

The statement of V.A. Karakovsky that the modeling of the educational environment is an important factor in the formation of teacher behavior aimed at developing the student's personality. As an example of modeling the educational environment, he considers a school in which "zones of increased attention" and "zones of ordered behavior" were created. At the same time, the learning process is organized in such a way that it focuses students on self-improvement, on their

achievement of individual success. It is important to note that back in the early 2000s, V.V. Karakovsky emphasized the role of the teacher in modeling the educational environment, which was to mediate between knowledge and the child; a source of acquiring a variety of real (life) experience [2].

Thus, in our opinion, a comfortable educational environment is the dominant factor in the development of adolescent self-assertion. The indicators of a comfortable educational environment are: - consideration of the participants in the educational process as a "learning community", characterized by interactivity, interaction and respect for the diversity and value of each participant in the educational process; - creating a favorable psychological climate in the school, associated with the proper organization of work. As you know, the activity is accompanied by emotions and experiences, its distinctive feature is associated with an internal assessment from the position of "like - dislike". At the same time, it is important to take into account the value orientations of the participants in the pedagogical process, their moral standards and interests; - inclusion in the learning process of modern information and communication technologies that increase motivation and improve communication of students; - freedom of choice of educational routes as a result of freedom of teaching and research, teaching and learning; - self-organization and self-realization of personal potential.

A generalized analysis of the problem of self-affirmation allows us to state that initially self-affirmation acts as an innate desire, which subsequently becomes both a prerequisite and a result of a person's awareness of the value of his being, expressed in comparison of himself with others. At the same time, it is important to focus on the fact that, in an effort to assert himself, a teenager can involuntarily learn negative forms of behavior from observations of other people's communicative behavior patterns.

Agreeing with the opinion of E.A. Kireeva and T.D. Dubovitskaya [3], we have identified the following types of self-assertion: constructive, destructive, and refusal of self-assertion, each of which characterizes the model of communicative behavior of a teenager's personality. It should be noted that it is difficult to diagnose the levels of self-assertion formation in adolescents, which, in our opinion, is due, firstly, to a small number of methods aimed at studying this phenomenon and subjective perception of the proposed life situations in existing methods. Therefore, when conducting an experimental study with adolescents in the amount of 220 people, MBOU «Secondary School 2, t.Znamenskoye», we used a special diagnostic technique to determine the type of self-affirmation of adolescents and adolescents, developed by E.A. Kireeva and T.D. Dubovitskaya. This questionnaire consists of 18 statements regarding attitudes towards oneself, other people, learning, love, friendship, family, etc. "Each statement is represented by three possible answers. The subject is asked to evaluate which of the options for self-attitude and

attitude to various situations suits him "most" or "least of all". When processing the results, the answers "the least" are rated at 0 points, the answers "the most" are 2 points, the unselected answers are rated at 1 point" [3]. In addition, we have developed an author's questionnaire aimed at identifying the ideas of modern adolescents about the degree and value of self-affirmation as a process of motivating them to success and creative growth.

The pilot study has not yet been completed, but preliminary findings allow us to conclude that the problem of self-affirmation is of great importance for modern adolescents. Among the 220 adolescents surveyed by us, studying in grades 7-9, 47% of students showed high rates on the "constructive self-affirmation" scale, which indicates their emotional stability, independence, competence in communication, respect for others and expectations of a positive attitude towards their personality with side of other people. Indicators on the scale of "destructive self-affirmation" in 33% of students, emotional restraint, inadequate (overestimated or underestimated) level of self-esteem, the expectation of a negative attitude towards themselves from other people. On the scale of "refusal of self-assertion", 20% of students are characterized by a low level of achievement, self-abasement, self-denial, passive-indifferent behavior. The results of the ascertaining stage of the study show the need for corrective work with adolescents, which is planned for the next formative stage. The authors of the article are faced with the task of developing and testing a correctional program for adolescents with destructive self-assertion and denial of self-assertion.

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木材臭氧去木质素无损方法研究
STUDY ON OZONE DELIGNIFICATION OF WOOD BY NONDESTRUCTIVE METHODS

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抽象的。通过无损方法（漫反射紫外光谱和拉曼光谱）研究了用臭氧处理白杨（Populus tremula）木材后获得的木质纤维素材料（LCM）。

木质素（LG）的破坏证明在臭氧转化率 ≥ 50% 的特定臭氧消耗量≤1.5 mmol/g 的范围内最有效。用臭氧破坏紫丁香基和二苯乙烯结构以及其他LG的共轭双键系统是最有效的。

关键词：木材，木质素，臭氧，拉曼光谱，紫外光谱。

Abstract. Lignocellulose materials (LCMs) obtained after treatment of aspen (Populus tremula) wood with ozone were studied by of nondestructive methods (diffuse reflectance UV spectroscopy and Raman spectroscopy).

The destruction of lignin (LG) proved most effective in the range of specific ozone consumptions of ≤1.5 mmol/g at ≥ 50% conversion of ozone. The destruction of syringyl and stilbene structures and other systems of conjugated double bonds of LG with ozone was mostly efficient.

Keywords: *wood, lignin, ozone, Raman spectroscopy, UV spectroscopy.*

Ozone has found application in paper pulp delignification technologies and wastewater treatment processes in pulp and paper industries [1]. In this connection, the kinetics of ozone reactions with lignin LG) was studied in [2,3]; to establish the main trends in the degradation of LG in reactions with ozone, the kinetics and mechanisms of reactions were studied using a number of structural models of LG as an example [2–4].

Ozonation of biomass is known as a pre-treatment step in multistage processes for the production of polysaccharides, monosaccharides, and bioethanol. Delignification makes it possible to increase the availability of cellulose for reagents

at subsequent stages of processing of the material [5–7]. Among the advantages of ozone as a delignifying agent with respect to biomass are the absence of toxic products of decomposition and selectivity of O_3 with respect to LG, while cellulose (CL) and hemicelluloses (HC) are relatively stable against treatment with ozone [5–12]. Studies of the efficiency of biomass delignification under various conditions of ozonation made it possible to find the best conditions for biomass delignification [5–11]. For aspen wood, ozonation was shown to be most efficient at 55–60% water in the sample, when the delignification degree (DD) of wood reaches 60% according to the LG content determination for ozonized samples [12, 13]. An analysis of the stoichiometry of the amount of absorbed ozone, DD, and amount of water-soluble products showed conclusion that the destruction of LG in lignocellulose materials (LCMs) occurs mainly due to ozonolysis reaction [5-10]. The products of ozonolysis are aliphatic acids (formic, oxalic, glyoxalic, etc.), which are further oxidized in the course of prolonged treatment with ozone [10, 13].

Along with the use of destructive analytical methods, information on the physicochemical properties of LCMs can also be obtained using nondestructive methods. Thus, FTIR as well as Raman spectroscopy (RS) are widely used to study the structure of LG, HC and CL in LCMs [9,10,16-18]. The dynamics of LG transformations in pine wood during delignification with ozone was studied by diffuse reflectance UV spectroscopy (DR–UV) [14].

The goal of this study was to characterize the physicochemical properties of LCMs obtained by wood treatment with ozone and to assess the potential of nondestructive methods in studies on biomass delignification. To solve this problem, the LCM samples obtained by ozonation of aspen wood (*Populus tremula*) were studied by UV and Raman spectroscopy.

Experimental

The material under study was sawdust of aspen wood (*Populus tremula*) with particle sizes of 0.315–0.63 mm and 57–60% moisture contents (MC) relative to the mass of oven dry wood (o.d.w.); MC= $(m_{H2O}/m_{o.d.w.}) \times 100\%$. [9,10]

A series of experiments were performed with different durations of ozone treatment of 0.40–0.45 g wood samples. Ozonation was carried out in a flow type unit at 25°C in a fixed bed reactor. The unit consisted of an ozonizer (Medozone 03/05), ozonometer (Medozone 254/3), and a catalytic cartridge for decomposition of unchanged ozone.

Ozone—oxygen mixture with an ozone concentration of 90 ± 5 mg/Lwas passed through the reactor at a flow rate of 4 L/h. The amount of absorbed ozone $Qr(t)$ at a moment of time t was calculated from the kinetic curves of ozone concentration by the equation (1)

$$Q_r\,(t) = \frac{U}{m} \int_0^t (C_t^* - C_t)\,dt \quad (1),$$

where U is the flow rate of the gas mixture (L/s); and are the current ozone concentrations at the inlet and outlet of the reactor with the sample, respectively; and m is the mass of o.d.w. The error of determination of $Qr(t)$ is 10%. The ozone conversion (α, %) at a moment of time t was calculated by the equation (2)

$$\alpha(t) = \frac{\int_0^t C_t \, dt}{\int_0^t C_t^* \, dt} \times 100, \% \qquad (2).$$

The ozonized LCM samples were washed with distilled water to remove the water-soluble products of ozonation [14]. Then the LCM samples were air-conditioned at 20°C for 5 days. [19]. The air-dry samples were studied by Raman spectroscopy and diffuse reflectance UV spectroscopy.

The Raman spectra were recorded on a Bruker Equinox 55/S instrument (Germany) with an FRA 106/S attachment. The excitation wavelength was 1064 nm, laser power 850 mW, and spot size 0.1 mm. The spectra were recorded from four different randomly chosen points of the sample. The experimental Raman spectra were normalized to the intensity of the 1096 cm^{-1} band, and then the average intensities of some bands in the Raman spectrum were determined. Further operations were performed with these normalized and averaged spectra.

The diffuse reflectance UV (DR–UV) spectra of the wood samples (100 mg) were recorded on a Specord M-40 instrument (Carl Zeiss Jena, Germany) with an integrating sphere in the range 220–820 nm. A sample of $BaSO_4$ was used as a reference (its reflection was taken to be 100%).

Results and discussion

Ozonation process.

Figure 1 shows a series of kinetic curves for the specific absorption of ozone during the treatment of aspen wood.

Figure 1. *Kinetic curves of ozone consumption by aspen wood.* O1, O2, O3, O4, O5, O6.
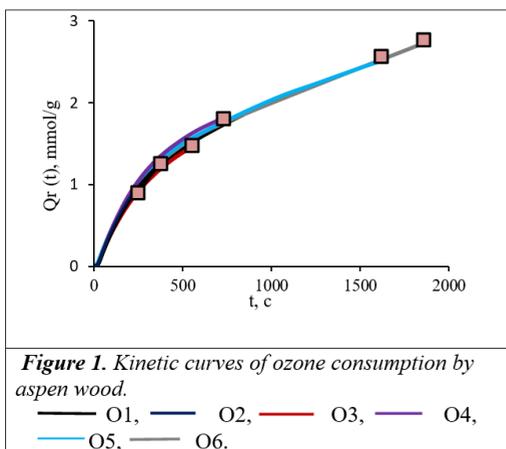
The curves basically correspond to different sections of the same kinetic curve that describes ozone absorption. This feature is typical for the kinetic curves of ozone absorption during the ozonation of biomass at the optimum moisture content [6, 10, 12, 13]. The dots show the specific values of ozone (Qr) corresponding to the end of ozone treatment. The ozone absorption rate (determined as the slope of the tangent to the

absorption curve) is maximum in the range of Qr = 0–1.5 mmol/g (samples O1-O3); in the course of ozonation, it markedly decreases, as the less reactive groups are gradually involved in the reaction.

Table 1 lists the Qr values and ozone conversions for the samples obtained at different durations of ozonation. The reagent (ozone) conversion corresponding to the completion of treatment gradually decreases from 70% (sample O1) to 20% (O6).

Table 1.

Specific absorption of ozone (Qr) and ozone conversion (α)
depending on the ozonation time (t) of aspen wood

sample	t, c	Qr, mmol/g	α,%
O1	250	0,9	70
O2	350	1,2	60
O3	500	1,5	50
O4	850	1,7	35
O5	1650	2,6	30
O6	1900	2,8	20

For the O1 and O2 samples, the initial section of the specific ozone absorption curves in Fig. 1 is almost linear (the ozonation time is a few minutes), and ozonation is most effective for them, as shown by the α values. The region of the least effective ozone absorption is observed for the O5 and O6 samples.

Raman spectra.

Figure 2 shows the Raman spectra of the samples in the region of 200–1800 cm−1 (Fig. 2a) and in the region of the stretching vibrations of C–H bonds (Fig. 2b). The intensity of the experimental spectra is normalized to the intensity of the 1096 cm^{-1} band, as suggested by the author of [15]. The spectra correspond to the literature data on Raman spectroscopy of plant materials [15–18]. The bands are as follows: 1375 cm^{-1} (δC–H in R^{3}CH in cellulose); 1330 cm^{-1} (deformation vibrations of C_{ar}–OH or C_{ar}–O–CH$_3$ [15] in lignin); 1260 cm^{-1}(vibrations of C_{ar}–O–CH$_3$ and C_{ar}–O of the aromatic ring with C–O groups; stretching C–O vibrations); 1096 cm^{-1} (ν C–C and ν C–O in hemicellulose and cellulose);and 920 cm^{-1} (δCH, δC–C, and δC–O in-plane stretching vibrations and bending vibrations of the ring [17, 18]).

The spectrum of the starting sample (no. 1) contains the bands of the skeletal vibrations of the aromatic rings (1600 cm^{-1}) and the 1661 cm^{-1} band ($\nu_{C=C}$ for the structures of the type of coniferyl and synapyl alcohol [17,18]). For the O2–O6 samples, the intensity of these bands noticeably decreases (Fig. 2a), clearly

demonstrating the destruction of the aromatic rings under the characteristic of the change in the LG content. Figure 2c shows the $(I/I^0)_{1600}$ values.

For the ozonized samples, (I/I0)1600 decreases with increasing Qr, the decrease being most appreciable at Qr < 1.5 mmol/g (Fig. 2c). Figure 2c also shows the curve of LG content in ozonized aspen wood taken from [13]. The LG content decreases from 25.3% (initial sample) to 10% per 1 g of o.d.w. at Qr ~ 2.6 mmol/g. The presented dependences indicate that the main area of LG degradation is the initial section of the ozone absorption curve, where Qr $\leq$ 1.5 mmol/g, and $\alpha \geq 50\%$ (Table 1, Fig. 1). Figure 2d shows the fractions of ozone-degraded lignin (DLG*) in percent (DLG* = $(1 - (I/I^0)_{1600})\times100$) determined from the intensity of the 1600 cm^{-1} band in the Raman spectrum. The DLG* value increases, as does the degree of wood delignification (DD)*) [13]. It can be seen that at the same specific ozone consumptions, DD increases to 55–60%, while DLG* increases to 58–65%. The reason for the discrepancy between the DLG* and DD values is the fact that the information obtained by Raman spectroscopy was obtained directly from the particle surface of the samples, where the destruction of LG by ozone occurred, while the degree of delignification was determined on the base of the average values of LG content in the samples obtained by means of a destructive method [13].

The band at 1620 cm^{-1} was considered in [18] as a marker of vibrations of the C=O groups conjugated with the aromatic ring. It decreases for the O2 and O3 samples. The band at 1662 cm^{-1}, which is a marker for the α, β unsaturated bonds conjugated with the aromatic ring [18], also decreases.

Figure 2b shows the Raman spectra in the range 2600–3200 cm–1; in Fig. 2c, the $(I/I^0)_{2899}$ and $(I/I^0)_{2937}$ values, normalized to the intensity of the band in the spectrum of the starting wood by analogy with $(I/I^0)_{1600}$, are presented as functions of Qr. Figure 2b shows that the intensity of

*) (The degree of delignification (DD, %) is the ratio of the amount of degraded lignin to the amount of lignin in the starting sample).
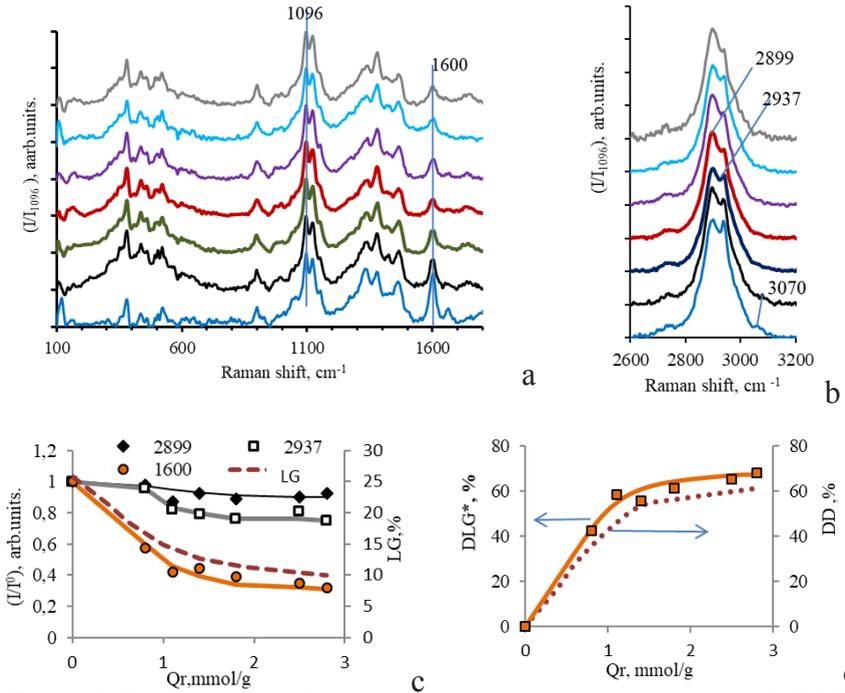
Figure 2. *Raman spectra of the aspen wood samples in the ranges (a) 100–1800 and (b) 2600–3200 cm⁻¹; ____ 1, ____O1, ____O2, ____O3, ____O4, ____O5, ____O6. (c) parameters $(I/I^0)_{1600}$, $(I/I^0)_{2899}$, and $(I/I^0)_{2937}$ and LG contents [13] depending on the specific absorption of ozone; (d) dependences of the fraction of destroyed lignin (DLG*) and degree of delignification (DD) [13] on the specific absorption of ozone.*

the 3070 cm⁻¹ band (ν C–H of the aromatic ring), as well as that of the 2937 cm⁻¹ band (stretching C–H vibrations in the CH_3 and OCH_3 groups of LG and HC [18]) decreased for the ozonated samples. The intensity of the 2899 cm⁻¹ band (stretching C–H vibrations of cellulose) and the 2937 cm⁻¹ band changes symbatically as *Qr* increases. This is observed in the *Qr* range above 1,5 mmol/g, in which the intensity of the vibrational bands of the aromatic C–C bonds is almost constant (Fig. 2c).

The Raman spectral data show that in the range of *Qr* < 1.5 mmol/g the main process is the destruction of aromatic rings accompanied by the destruction of HC, which was found earlier in the thermal analysis of ozonized aspen wood [16]. According to the Raman spectral data, CL destruction is not observed.

Diffuse reflectance UV spectra.

Figure 3a shows the diffuse reflectance UV (DR-UV) spectra for the starting sample (no. 1) and some ozonated samples; in Fig. 3b, the same spectra are given in Kubelka–Munk (KM) units ($F(R)$). The Kubelka-Munk function is the ratio of the absorption coefficient to the scattering coefficient of the medium $F(R) = k/s = (1 − R)^2/(2R)$. The function ($F(R)$) makes it possible to evaluate the absorption of an infinitely thick layer of the sample at a given wavelength.
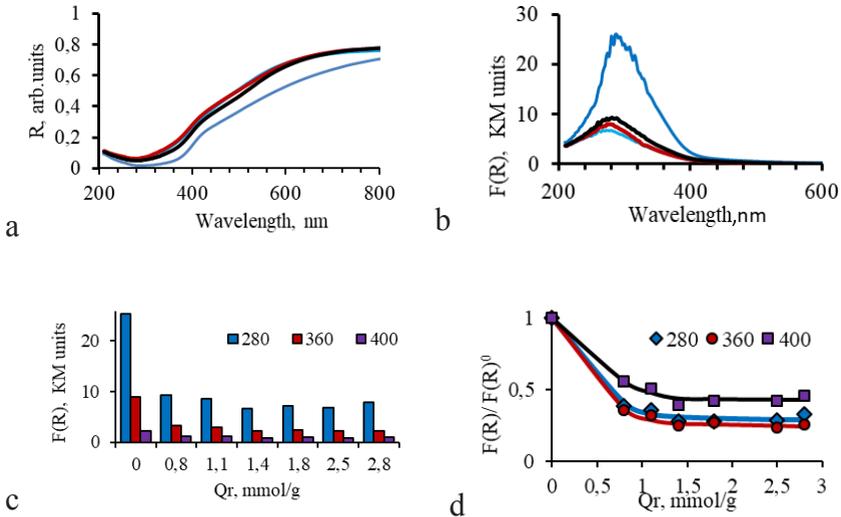
Figure 3. *Diffuse reflectance UV spectra of the aspen wood samples in (a) reflection units and (b) Kubelka–Munk (KM) units.*
_____1, _____O1, _____O3, _____O5.
(c) Dependences of F(R) and (d) F(R)/F(R)⁰ at wavelengths of 280, 360, and 400 nm on the specific absorption of ozone.

According to the figures, all LCMs under study absorb in a wide spectral region and are characterized by a maximum at 280 nm. The spectrum is a set of numerous overlapping absorption bands related to different structures [1]. An analysis of the UV spectra of lignins and their structural models showed that non-conjugated phenol (syringyl, guaiacyl) structures absorb at 250, 295– 300 nm; the α-β double bonds and α-carbonyl groups conjugated with the phenol structure absorb in the regions 295–305 nm and 350–360 nm; in the region of 350–380 nm, absorption of stilbene structures is observed. Conjugation systems of coniferyl aldehyde absorb at 380–400 nm, while quinoid and quinone–methide structures absorb in the range of 450–580 nm [1].

Treatment with ozone leads to increased reflection throughout the entire region of the spectrum; the sample is "bleached", and the absorption intensity decreases (Figs. 3a and 3b). Figure 3c shows the $F(R)$ values for the wavelengths 280, 360, and 400 nm in the UV-DR spectrum of LCMs depending on the specific absorption of ozone. The $F(R)$ values decrease with increasing Qr at all of these wavelengths, reaching a plateau.

Figure 3d shows the $F(R)$ values normalized to the $F(R)^0$ value for the original sample (1) at the same wavelength. It can be seen that for the 280 and 360 nm absorption bands, the curves of $F(R)/F(R)^0$ versus Qr are close, and the $F(R)/F(R)^0$ values for the ozonized samples in the plateau region are 27–30% of the initial value. For the 400 nm band, the $F(R)_{400}/$ values for the ozonized samples are ~40% of the initial value. The presented data show that the structures that absorb in the UV region of the spectrum were destroyed by ozone to the greatest extent.

Ozonolytic delignification

Thus, the study of ozonation of various LCMs and tendencies in ozone absorption depending on the ozone treatment conditions and moisture content in the biomass sample, which determines the size of the surface available to the reagent, led to the conclusion that the process is controlled by external and internal diffusion factors [6,11,13]. The ozone reactions occur on the surface of the porous structure of LCMs accessible to ozone molecules. Under optimum conditions for wood delignification, reactions of biomass with lignin mainly involve molecular ozone dissolved in water present in the porous structure of the biomass [5,6,9,13]. Molecular ozone enters into electrophilic cycloaddition reactions, followed by the opening of the aromatic ring and formation of products— aliphatic acids. This mechanism (ozonolysis) was described for model LG structures; it is believed to occur during the interaction of O3 with LG in the structure of biomass [5–11]. Ozone is an electrophilic agent and interacts mainly with the functional groups and bonds characterized by high electron density [20]. A comparison of the activities of organic compounds in reactions with ozone and kinetic studies for some of them led to the conclusion that unsaturated structures and stilbens are most active in these reactions; in the activity series, these are followed by syringyl and guaiacyl structures and then by carbonyl-containing and polyaromatic compounds [2–4,20]. The aliphatic bonds are oxidized with ozone relatively slowly [20]. The data indicating the predominant ozone destruction of LG structures with UV absorption characteristic of compounds that are most active in reactions with ozone are expected as they are fully consistent with the known tendencies in the activity of organic compounds in reactions with ozone.

The studied LCM samples differ in the Qr value achieved with different durations of ozonation, which makes it possible to consider the gradual destruction of the biomaterial during ozone treatment. The data of the present study show that

the main changes in the structure of LCMs are observed after absorption of the first ~1.5 mmol/g. The ozone absorption is characterized by the highest rate, and the ozone conversion is relatively high. As shown by the Raman spectra, efficient destruction of LG occurs at this stage, which is accompanied by the destruction of hemicelluloses; the oxidation of CL in this area of ozone consumption was not observed. Ozone absorption at subsequent stages is less efficient.

The transformations of LCMs were studied here by nondestructive methods as they provide information about the properties of the material surface some part of which was modified with ozone. Ozone destruction of syringyl, phenylcumarane, and stilbene structures and other systems of conjugated double bonds proved highly efficient.

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科斯特罗马州深色腐殖质残留–水变森林土壤的有机质和表面特性
ORGANIC MATTER AND SURFACE PROPERTIES OF THE DARK HUMUS RESIDUAL-HYDROMORPHIC FOREST SOIL OF THE KOSTROMA OBLAST

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抽象的。 已经研究了在三叠纪沉积物和目前森林植被下发育的科斯特罗马州黑色腐殖质土壤中有机物的含量、组成和性质。 深色腐殖质土壤上层轻质部分的碳浓度不超过俄罗斯平原地带性土壤的典型值。 然而，其积累的总水平比自形态土壤的典型水平高几倍。

深色腐殖质土壤的上部有机层具有高聚集和高润湿角（>75º）的特点。 氮吸附的比表面积仅为0.6 m2/g，总比表面积的值很高（S总> 150 m 2/g.）。

关键词 – 有机质，比表面积，三叠纪沉积物，深色腐殖质土壤

Abstract. *The content, composition, and properties of organic matter in the dark-humus soil of the Kostroma Oblast developed on the deluvium of the Triassic deposits and currently under forest vegetation have been studied. The carbon concentration in the light fractions of the upper horizon of the dark-humus soil does not go beyond the values typical for the zonal soils of the Russian Plain. However, the total level of its accumulation is several times higher than that typical for automorphic soils.*

The upper organogenic horizon of the dark humus soil is characterized by high aggregation and high wetting angles (>75º). The specific surface area for nitrogen sorption is only 0.6 m²/g, with a high value of the total specific surface area (S_{total} > 150 m ²/g.).

Keywords *– organic matter, specific surface area, Triassic deposits, dark humus soil*

Introduction

The northeast of the Kostroma Oblast is a territory with a complex history of the formation of sediments that serve as soil-forming rocks. Until now, this section of Russia has not been studied enough. In terms of soil, the most interesting in the natural aspect of the territory Oblast on the southern slopes of the Northern Uvals, adjacent to the Vetluzhsko-Unzha interfluve, mostly covered with forest, remain practically unexplored in terms of soil. Here, against the background of loamy soddy-podzolic and sandy Al-Fe humus podzols dominating in the area on glacial deposits on drained slopes, organo-accumulative soils of unusual genesis are formed, confined to the outcrop of Triassic clayey sediments, heavy in granulometric composition of eluvium. [1,2]. It was revealed that a characteristic feature of these soils is the high humus content of the upper organic-accumulative horizons.

The purpose of our research is to study the composition and surface properties of dark-humus soils formed on Triassic deposits and under forest vegetation.

Objects and methods of research

The object of study was a section of dark-humus organo-accumulative soil, laid in the Pyshchugsky district, 2 km south of the village of Talitsa and 500 m east of the Pyshchug-Nikolskoye highway. It is confined to the flat watershed part of the ridged rise on the gentle slope of the Northern Ridges. The vegetation is represented by a mixed herb spruce forest about 100 years old with a single admixture of birch, pine and a plentiful young spruce up to 10 m high. The ground cover is dominated by strawberries, stone berries, wild hoof, horsetail and green mosses. The granulometric composition of soils was determined both by the traditional pipette method and by the laser diffraction method [3]. To study organic matter, the method of physical (granulo-densimetric) fractionation was applied [4]. And to determine the content of total C, the method of dry combustion in an oxygen stream was used on an express analyzer for C AN-7529 M (Gomel, Belarus). The specific surface area was determined for water by the BET method and for nitrogen using a SOBSTOMETER [Russia]. The contact angle was determined on a DSA-100 water drop shape analyzer (KRÜSS, GmbH, Germany). [3]

Results and discussion

The study of the granulometric composition of the soil showed a rather weak differentiation of the soil profile with a predominance of physical clay (the content of particles <0.01 mm varies from 50% in the 10-20 cm layer and 62-70% in the 40-100 cm layer). The originality lies in the low content of silt 5-8%. The dust fraction predominates, and the fraction of fine and coarse dust dominates (23-43%). The predominance of silty fractions is a fairly common occurrence for mantle loams of the taiga zone. A characteristic feature of the dark humus soil is the high content of C organic matter (8-11%). An analysis of the features of the

distribution of organic matter is presented in the tables (tab. 1-3). The obtained data showed that more than 50% of the mass of the upper soil horizon is made up of light fractions with a density <2 g/cm³. About 80% of the mass of these fractions have a density < 1.8 g/cm³ and are black powder, similar in consistency to soot. The particle size of the bulk of the fraction (more than 75%) is particles < 50 μm. They are components of microaggregates. Particles of light fractions (LF) > 50 μm are inhomogeneous in size and are in a free state (LFw). The carbon concentration in the fraction with density <1.8 g/cm³ is 18.65% (tab. 1), and its total amount is 9.37% of the soil mass. The carbon content in fractions with a density of 1.8-2 g/cm³ is significantly lower and, in terms of the soil as a whole, is only 0.5%. Thus, the total level of carbon content in the composition of light fractions is about 10% of the soil mass, and more than 90% of its mass is concentrated in the fraction with a density < 1.8 g/cm³.

Table 1.
Carbon content in fractions, % by weight of fractions

Horizon, depth, cm		From the light faction < 1,8 g/cm³	From the light faction 1,8 g - 2 g/cm³	Strength of l. d.	Strength of t. d.	C remainder
AU	8-48	18.65	7.50	10.2	4.58	0.48
C	48-70	–	–	1.05	0.87	0.71
Cg	70-100	–	–	0.75	0.69	0.20

The carbon concentration in the light fractions of the upper horizon of the dark-humus soil does not go beyond the values typical for the zonal soils of the Russian plain. However, the total level of its accumulation is several times higher than that typical for automorphic soils. In hor. C light fractions were not found, which corresponds to the nature of their distribution in the zonal soils of the taiga zone. The mass of easily dispersible sludge is 18.33%. Its profile distribution has an eluvial-illuvial character. The maximum concentration of carbon is observed in the fraction of easily dispersed sludge and is 10.20%. In hor. C and Cg carbon content decreases sharply (tab. 2). The content of hard-to-disperse sludge is low (1-4%). The carbon content in its composition decreases below and down the profile. The carbon concentration in the soil residue after silt extraction from it and its total content are insignificant (tab. 1).

Based on the obtained data and previous studies [5], the share of carbon in the main organomineral fractions isolated from the dark humus soil was shown (tab. 2). About 85% of the mass of carbon in the humus-accumulative horizon is concentrated in the LF (light fraction), which includes incompletely humified remains

of organic litter. About 16% of the carbon is bound by silt particles (mostly easily dispersed silt), and the remainder accounts for about 1%, as already noted earlier. In the underlying horizons, the mass of carbon is distributed between silt particles and the residue after its release.

Table 2.

Distribution of carbon by soil fractions, % of C total.

Horizon, depth, cm		Msg, %	C light fraction	Strength of l. d.	Strength of t. d.	Strength of l.d.+etc.	C remainder
AU	8-48	11,91	83,14	15,75	0,02	15,77	1,09
C	48-70	0,81	–	34,60	3,7	38,30	61,70
Cg	70-100	0,40	–	42,50	7,5	50,00	50,00

Table 3

Surface Properties and Carbon Distribution of Organo-Mineral Fractions from Humus-Accumulative Horizons of Dark-Humus and Zonal Soddy-Podzolic Soil

Soil	Horizon power, cm	The mass of silt % by of weight soil	Smectite content, % by weight factions	C_{total} % of the mass of soil	C_{ext}. of N, m²/g	KUS, degrees
Dark-humic	40	18,0	90,0	11,9	0,6	75,5
Sod-Podzolic zonal	11	7,0	15,0	3,5	2,64	42,5

It is known that the hydrophobic properties of the soil are determined by the quantity and quality of organic matter and the characteristics of their interaction with the mineral part of the soil. Easily soluble organic matter itself, as well as plant litter, due to their origin, are characterized by high hydrophobicity: contact angle > 90°. However, in the process of transformation and binding with the mineral matter of the soil, plant derivatives lose this property, approaching the mineral component of the soil in their surface properties. However, it is not clear to what extent this process is expressed. Obviously, depending on the specific conditions for the transformation of plant litter, the degree of manifestation of the hydrophobic properties of easily decomposable organic matter will be different.

An analysis of the wettability of individual densimetric fractions showed that the fractions differ significantly in the considered indicator and range from 22 to 137 degrees [6,7]. In general, in light fractions <1.6 g/cm^3, both free and intraaggregate, the values of wetting angles are significantly larger compared to heavy fractions. Thus, it should be expected that less altered plant residues will be characterized by a large contact angle. However, it should be taken into account that the surface properties of soils are by no means always determined only by the chemical structure of the sample, but depend both on the granulometric composition and on the reaction of the medium. The studies of Dymov A.A., Milanovsky E.Yu., Kholodov V.A. [7] showed that for the soil of the indigenous spruce forest, the illuvial horizon, the most hydrophobic soil organic matter in the litter, is characterized by the highest hydrophilicity due to the high proportion of lignin-like compounds. And during natural reforestation, the transformation of organic matter consists in the formation of predominantly hydrophilic components in the litter, which cause acid hydrolysis of minerals and the accumulation of Fe-Al - organic compounds in the upper mineral horizons of the profile. Thus, our studies have shown an anomalously high level of OM accumulation in the humus horizon of the dark humus soil, which is 3–4 times higher than its total content in the automorphic soils of the southern taiga subzone.

It is also very important that the total amount of fractions-carriers of organic matter exceeds 75%. In soddy-podzolic soil, the share of OM carrier fractions is less than 20-25%. These data give grounds to conclude that the upper horizon of the dark humus soil is organogenic. Both fractions-carriers of organic matter are components of large water-stable microaggregates, which absolutely predominate in the soil. These features of the organic matter of the dark humus soil are confirmed by the data of the study of the surface properties of soils. The presented data show a significant increase in the hydrophobicity of the upper horizon of the dark humus soil compared to the zonal soddy podzolic soil (tab. 3). The high aggregation due to the high carbon content determines the significantly lower value of the outer specific surface area of the organogenic horizon of the dark humus soil compared to the soddy podzolic soil. [tab. 3]

Conclusions

The conjugate study of organic matter by the method of physical fractionation and the surface properties of the dark-humus soil of the Kostroma Oblast, formed in an automorphic position on clay deposits of the Triassic age, indicates a possible hydromorphic nature of its origin.

The upper organogenic horizon of the dark humus soil is characterized by high aggregation and high wetting angles (>75º). The specific surface area for nitrogen

sorption is only 0.6 m²/g, with a high value of the total specific surface area (S total > 150 m²/g.).

The study was carried out on the topics of research: Physical foundations of the ecological functions of soils: technologies for monitoring, forecasting and management (№ 121040800146-3), soil information systems and optimization of the use of soil resources (№ 121040800147-0).

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通过向储层注入二氧化碳来强化石油生产

OIL PRODUCTION INTENSIFICATION BY INJECTION OF CARBON DIOXIDE INTO RESERVOIR

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抽象的。本文提出了开发处于后期开发阶段的领域的问题。增加的含水率导致了这样一个事实，即过去相关的一些增加石油产量的方法在我们这个时代并不能完全发挥它们的作用。这一事实导致需要研究和开发新的方法来增加原材料的产量。

本文提出研究向储层注入二氧化碳提高油气产量的方法的原理和技术，讨论了该技术的经济性、环境性和实用性。

环境稳定性的问题被提出，伴随的石油气的燃烧破坏了环境稳定性，因此二氧化碳排放到大气中。根据所揭示的信息，对该技术进行了分析，并给出了该技术的实际实施示例。

关键词：石油生产集约化；碳氢化合物；二氧化碳；增加石油产量的方法；

Abstract. This article raises the problem of developing fields that are at a late stage of development. Increased water cut leads to the fact that a number of methods for increasing oil production, which were relevant in the past, do not fulfill their functions in full in our time. This fact causes the need to study and develop new ways to increase the production of raw materials.

The paper proposes to study the principle and technology of the method for increasing hydrocarbon production by injecting carbon dioxide into the reservoir, discusses the economic, environmental and practical components of this technique.

The problem of environmental stability is raised, which is violated by the burning of associated petroleum gas and, as a result, carbon dioxide emissions into the atmosphere. Based on the revealed information, an analysis of this technique is given and examples of the practical implementation of the technology are given.

Keywords: Intensification of oil production; hydrocarbons; Carbon dioxide; Methods for increasing oil production;

The late stage of oil field development is characterized by increased water cut, an increase in the concentration of hydrated and asphalt-resin-paraffin deposits (ARPD), as a result of which the resistance to fluid flow in compressor-pump pipes (CPP) increases, and the process of hydrocarbon mixture production from the subsoil decreases at low production rates. Every day, the number of fields with easily produced hydrocarbons is decreasing, which obliges the oil and gas sector to develop new methods for intensifying the production of hydrocarbons.

An additional feature of the late development of deposits at present is the development of deposits with hard-to-recover reserves of hydrocarbons, including low-permeability reservoirs, which are often developed using hydraulic fracturing (HF) [1].

The question of the environmental friendliness of the process of developing and extracting oil is one of the problems of the oil industry: annually about 2-10 million tons of oil products enter the World Ocean, which causes the death of many inhabitants of the planet's water basin. Including raw materials that are poured onto the earth's surface for various reasons, pollute the air, as a result of which the influence of the greenhouse effect on the atmosphere increases [2].

The relevance of this problem is given by the fact that regardless of which method of increasing oil production was chosen at the field, the volume of unrecoverable reserves is about 55-75%. As a result, engineers in the oil and gas industry need to develop more technologically advanced and environmentally friendly methods of production stimulation [3].

One of the promising options for enhanced oil recovery, which will reduce the negative impact of emissions into the atmosphere, is the secondary injection of carbon dioxide (CO_2) into the reservoir as a reagent for the stimulation of hydrocarbon production.

CO_2 emissions have had a strong impact on the environment, in connection with which the gas content in the atmosphere began to reach critical values. This problem is important for the well-being of the Earth, as a result of which attention is now growing all over the world to reduce carbon dioxide emissions, including those resulting from the combustion of petroleum products [4].

There is a growing interest in oil companies to use CO_2 as a reagent to increase oil production, fueled by the rapid growth of the world's energy needs. These concepts find a common solution through the use of CO_2 injection to increase production and sequester hydrocarbons. [5]

Carbon dioxide has a beneficial effect on the physicochemical properties of reservoir fluids and water when injected into the reservoir. The content of CO_2 in oil affects its viscosity: dissolving in oil, carbon dioxide reduces it.

The gas dissolved in oil increases its volume, which results in an increase in the saturation of the pore space with hydrocarbons, which leads to an increase in relative oil permeability. Light components of oil, upon contact with CO_2, dissolve in it and are transferred to the displacement front, which contributes to an increase in oil recovery.

It is worth highlighting the favorable effect of carbon dioxide on the permeability of traditional rocks (carbonate and terrigenous). Carbon dioxide dissolves the rock-forming minerals of the reservoirs, which leads to an increase in PPP (permeability and porosity properties). In addition, with an increase in the content of carbon dioxide and an increase in its temperature, the absorption of the gas mixture by the rocks increases, and, consequently, the final oil and gas recovery [8].

Carbon dioxide has two characteristics that make it a good choice as an injection gas: it is miscible with crude oil and is less expensive than others. When carbon dioxide is injected into an oil reservoir, it becomes mutually soluble with the residual crude oil, as light hydrocarbons dissolve in carbon dioxide and vice versa. This easily occurs when the density of carbon dioxide is high (when it is compressed) and when the oil contains a significant amount of "light" hydrocarbons (typically low density crude oil). Below a certain minimum pressure, carbon dioxide and oil will not mix, and therefore the reservoir pressure must be taken into account. When CO_2 and oil are mixed, the forces holding the oil in the pore space virtually disappear, which allows the oil to be easily displaced from the reservoir [1].

There are similar reagents for increasing oil recovery from reservoirs, but since these products are processed from crude oil and therefore are relatively expensive, it is not economically feasible to use them as a chemical agent.

Carbon dioxide remains in the deposit only partially. This is due to the fact that when injected into the reservoir, a certain volume of carbon dioxide dissolves in the oil and comes out with it to the surface. At the surface, the oil is processed, the resulting CO_2 is separated from the produced natural gas and recovered for reuse along with additional volumes of newly purchased carbon dioxide.

The limitation for carbon dioxide injection is the temperature of the injected gas. Above 85 ^{0}C, GOWM (gas-oil-water manifestation) is observed, and therefore the risk of well loss increases [7].

According to statistics, on average, 1 barrel of additionally produced oil contains about 85-115 m^3 of carbon dioxide. At the same time, 20-30% of carbon dioxide remains "buried" in the deposit.

The introduction of oil displacement technology by water-gas treatment is a capital-intensive undertaking. The problems associated with enhanced oil recovery due to the injection of CO_2 into the reservoir are of a technological, economic and supply nature. For example, the transfer of CO_2 from a source to a field requires an

extensive pipeline network, an important component of which are high-pressure compressors. It is necessary to assess the profitability of oil stimulation operations in order to provide an overall assessment of economic costs and revenues.

As a rule, the most costly activity is the purchase of CO_2. Costs can reach 25-50% of the cost of oil produced. [9]. To reduce them, it is necessary to develop technologies for producing carbon dioxide.

For this, new methods have been developed, such as alternating water, CO_2 injection and simultaneous water and CO_2 injection (WAG), which are designed to increase the efficiency of oil production at a lower cost [6]. With this method, water/gas volume injection ratios range from 0.5 to 4 in reservoir conditions. This approach mitigates the downward trend in the viscosity of carbon dioxide, which will move ahead of the displaced oil. After carbon dioxide is injected into a production well, any gas injected after that follows the same path, reducing the overall efficiency of the injected fluids [6].

Currently, installations are used that allow capturing carbon dioxide vapors released during combustion from the air. This technology is called CCUS (Carbon Capture, Usage and Storage) [3].

To date, the CCUS segment is developed in the USA, Canada, China, Australia, Japan, Venezuela and a number of European countries. The most advanced country in terms of technology adoption is the United States, which has about 60% of CO_2 capturers. The Permian Basin stands out in particular, where this segment is developed at a high level. For example, Occidental Petroleum Corp. (USA) transports 33.9 million m^3 of carbon dioxide daily [6].

Negative emissions technologies (NET) return the carbon that was released into the atmosphere as CO_2 from the combustion of petroleum products back to permanent and safe underground storage [3].

BECCS (Bioenergy with carbon capture and storage) involves the production of CO_2 from vegetation, followed by extraction from combustion products during combustion.

With DACCS (Direct Air Capture with Carbon Storage), CO_2 is captured directly from the air. In both cases, the trapped CO_2 is compressed and then pumped into the pore space of rocks more than a kilometer deep under impermeable rocks that will hold it for tens of thousands of years [3]. The technological process is shown in figure 1.
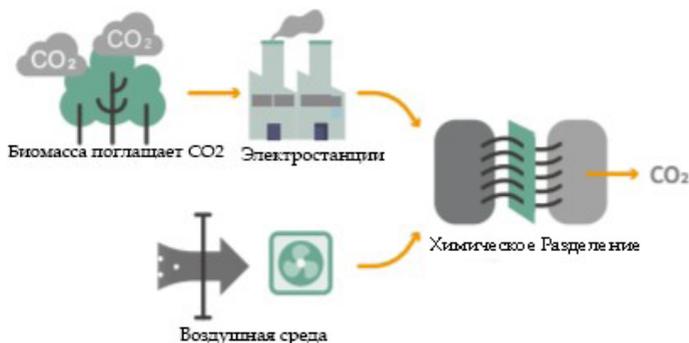
Figure 1. *Technological process for obtaining CO_2 using BECCS and DACCS*

The United States leads the world in both the number of CO_2 enhanced oil recovery projects and the volume of oil produced using this method.

In Texas, carbon dioxide is mainly mined from natural sources. For the largest Weyburn/Midale (USA) carbon capture and storage project, carbon dioxide is pumped from a nearby power plant. In addition, other projects related to the collection, preparation and processing of CO_2 will be implemented in the near future. Sandridge Energy Inc. (USA) and Occidental Petroleum Corp. (USA) are planning to develop a 1.1 billion dollars natural gas processing plant [6].

With the introduction of this method of production stimulation at the Bachaquero field (Venezuela), it was possible to increase the flow rate in a ratio of 7:2 in 4 months compared to the cold method of production. This practice was also introduced at the Sacroc field (USA), where, due to the injection of CO_2 into the reservoir, the increase in oil production increased from 1869 m³/day to 4060 m³/day [10].

The Russian company Tatneft plans to inject CO_2 into the Biklyanskoye field to increase oil recovery. Tatneft expects to gradually reduce carbon dioxide emissions into the environment and become carbon neutral by 2050 [11].

In 2014, the Oil and Gas Climate Initiative (OGCI) was founded in London and Houston to combat the effects of CO^2 emissions into the atmosphere. Currently, it includes 12 companies that carry out about 30% of world oil and gas production: Chevron, Eni, BP, CNPC, ExxonMobil, Occidental, Shell, Total, Saudi Aramco, Repsol, Petrobras, Equinor. In 2021, the organization announced that the main goal is to reduce the average carbon intensity of the production processes of oil and gas companies from 11.6 m³ of greenhouse gases per barrel of oil in 2017 to 8.6 m³ by 2025. OGCI also proposed to reduce the average intensity of

methane use in the production of raw materials at the initial stages of production from 0.30% in 2017 to 0.20% by 2025 in order to achieve near-zero gas emissions to the atmosphere. In 2020, according to OGCI, the cumulative intensity rate was 0.20%. It is estimated that these changes will reduce CO_2 emissions by around 25 million m^3 per year. Partner companies collectively invest more than 7 billion dollars annually in low-carbon production [2]. The OGCI targets for 2025 are shown in figure 2.

Figure 2. OGCI targets for 2025

The method of intensifying field development by injecting CO_2 into the reservoir attracts not only with its novelty, but also with the ability to utilize carbon dioxide, which contributes to the development of the greenhouse effect. However, its implementation requires enormous costs, corrosion-resistant equipment and a network of pipelines.

Based on our analysis, we can conclude that due to the achievement of critical values of CO_2 in the atmosphere, an increase in the proportion of high-viscosity oils and low-permeability reservoirs, as well as the depletion of fields with a high degree of water cut, the method of increasing oil production by injecting carbon dioxide into the reservoir can be considered appropriate, environmentally friendly and one of the most promising for the development of deposits composed of traditional rocks. For its implementation, it is necessary to take into account the geo-

logical structure of the deposit, the availability of equipment and the possibility of using technologies for oil displacement by water-gas treatment.

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