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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 International Conference

Beijing, China 2018

# 上合组织国家的科学研究:协同和一体化 国际会议

# 参与者的英文报告

# International Conference "Scientific research of the SCO countries: synergy and integration"

Part 1: Participants' reports in English

2018年6月29-30日 中国北京 June 29-30, 2018. Beijing, PRC



# Materials of the International Conference "Scientific research of the SCO countries: synergy and integration" - Reports in English

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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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These Conference Proceedings combines materials of the conference – research papers and thesis reports of scientific workers. It examines tecnical and sociological issues of professionalization personality. Some articles deal with theoretical and methodological approaches and principles of research questions of personality professionalization.

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# Foreword

We thank all participants of our conference "Scientific research of the SCO countries: synergy and integration" for the interest shown, for your speeches and reports. Such a wide range of participants, representing all the countries that are members of the Shanghai Cooperation Organization, speaks about the necessity and importance of this event. The reports of the participants cover a wide range of topical scientific problems and our joint interaction will contribute to the further development of both theoretical and applied modern scientific research by scientists from different countries. The result of the conference was the participation of 83 authors from 7 countries (China, Russia, Uzbekistan, Kazakhstan, Azerbaijan, Tajikistan, Kyrgyzstan).

The holding of this conference was a result of the serious interest of the academic world community, the state authorities of China and the Chinese Communist Party to preserve and strengthen international cooperation in the scientific field. We also thank our Russian partner Infinity Publishing House for assistance in organizing the conference, preparing and publishing the conference proceedings in Chinese Part and English Part.

I hope that the collection of the conference will be useful to a wide range of readers, will help to look at interesting questions for the reader under a new point of view, and also will allow to find contacts among scientists on common interests.

#### Fan Fukuan,

Chairman of the organizing committee of the conference "Scientific research of the SCO countries: synergy and integration" Professor, Doctor of Economic Sciences, member of the Chinese Academy of Sciences 前言

我们感谢所有参加本次会议的"上海合作组织国家的科学研究: 协同作用和整合",感谢您的演讲和报告。代表所有上海合作组 织成员国的广泛参与者都谈到此次活动的必要性和重要性。参与 者的报告涵盖了广泛的主题性科学问题,我们的联合互动将有助 于不同国家的科学家进一步发展理论和应用的现代科学研究。会 议结果是来自7个国家(中国,俄罗斯,乌兹别克斯坦,哈萨克 斯坦,阿塞拜疆,塔吉克斯坦,吉尔吉斯斯坦)的83位作者的参 与。

这次会议的召开,是学术界,中国国家权力机关和中国共产党对 维护和加强科学领域国际合作的高度重视的结果。我们还要感谢 我们的俄罗斯合作伙伴无限出版社协助组织会议,准备和发布中 英文会议文集。

我希望会议的收集对广大读者有用,将有助于在新的观点下为读 者提供有趣的问题,并且还将允许在共同利益的科学家中寻找联 系。

范福宽,

教授,经济科学博士,中国科学院院士,会议组委会主席"上合组织国家科学研究:协同与融合"

# 经济系统稳定性建模 Modeling of the economic systems stability

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我们的工作致力于经济体系稳定性分析的问题。与此同时,我们称稳定的经济增长和扩张达到现代人类技术发展水平所保证的极限。 "生产","利润","经营成本"等方面的增长应该与福利增长和人民群众基本的"未来的信心"和谐地结合起来。

这项研究的目标是:1)分析难以对一般和特别是经济稳定问题的研究 进行建模的因素;2)发展选项以提高均衡模型的有效性,有效性和实用价 值,以用于经济政策选择,其结果和前景映射。

在一组可计算的一般均衡模型和动态投入产出模型的基础上证明稳定性,经济和福利增长模型的权宜之计; 3)优化经济系统自身动态特性的数学算法的发展,模拟经济中投资活动的瞬态过程质量的辅助功能作为经济增长的必要条件。

致谢。这篇文章是在俄罗斯基础研究基金会的资助下编写的。批准号: 18-010-00193 A "基于动态投入产出平衡的CGE模型的信息扩展和分析能力"。

关键词: CGE模型, 动态"投入产出"平衡, 经济动态

Abstract. Our work is devoted to the problem of the economic systems stability analysis. At the same time, we call stable those economies that demonstrate growth and expansion up to the limits guaranteed by the modern level of technological development of mankind. Such growth in terms of "production", "profit", "business cost" should be harmoniously combined with the welfare growth and fundamental "confidence in the future" of the people.

The objectives of the study are: 1) the analysis of the factors that are difficult for modeling both in general and in the study of the economic stability problems in particular; 2) the development of options to improve the validity, effectiveness and practical value of the equilibrium models use for the options of economic policy, its results and prospects mapping.

Substantiation of expediency of stability, economic and welfare growth modeling on the basis of a set of computable General equilibrium models, and dynamic input-output models; 3) the development of mathematical algorithm for optimization of economic systems` own dynamic properties, auxiliary functions of the transient processes quality simulating investment activity in economy as a necessary condition for the economic growth.

Acknowledgments. The article was prepared with the financial support of the Russian Foundation for Basic Research. Grant No. 18-010-00193A "Expansion of Information and Analytical Capabilities of CGE-Models Based on Dynamic Input-Output Balance".

Keywords: CGE model, dynamic "input-output" balance, economic dynamics

# 1 FACTORS BEYOND MODELING

Before presenting the main part of the article, based on modeling and the body of mathematics, we have to identify the factors that are very difficult for modeling, but have a direct impact on the stability and quality of transient processes in the economy. In this sense, it is desirable to have balanced economic growth and the system to stay on the main trajectories [1], [2]. It should be noted that the models of economic development are formed both in symbolic and verbal and figurative form in the heads of persons making economic decisions (PMD).

PMD (Decision-makers) in their activities maximize their "utility function", the one, which is not always and not fully known by the public. That is why scientists in the 1990s made mistakes that had no analogues in the world practice of forecasting. The assertion that the modern economy after 2008 is difficult to predict is given in the article of D. A. Medvedev [3].

Planning is not mentioned in it at all, although it is even intuitively clear that it is better to live according to a bad plan than without any plan at all.

It is not just a crisis, but the crisis-matryoshka that is almost impossible for formal modeling, when, after the self-destruction of the USSR, the index of human capital collapsed thus resulting in large-scale corruption, which produced such a factor as the lack of financial resources.

Political instability in the world and sanctions pressure on Russia in the field of finance and technology have been superimposed on economic problems. Crisis events that have lately taken place, are being discussed in detail in [4] and [5], but the main reason for the low rates of economic development lies in structural problems [6], [7]. The roots of these problems are still Soviet. Later the implementation of the "Washington consensus" provisions by the team of Gaidar reformers became an additional burden for the economy. The liberal economic bloc of the government year after year removed the country from the "oil needle" only in re-

ports, which was covered by the world demand and the prices growth for domestic raw materials. At the same time, within the framework of economic liberalism, the government has done everything possible to keep the economy from a significant recession.

The budget deficit is small and is declining. If in 2016 it was 3.6%, the target for 2019 was set at 1.2% of GDP. The share of non-oil budget revenues approached the level of 60%, and only inflation of 2.52% is injustice and unrighteousness, obtained by withdrawal of money from the economy, when the effect of clamped demand and shrinking target markets works. But this is not enough, the moment has come to move from words to deeds with regard to the modernization of the economy. Institutional, infrastructural and macroeconomic growth conditions are important, but the growth itself is not yet triggered. We need both the investment climate and the investments themselves, those ones Russia has great and even man-made problems with, began at the time of the USSR collapse.

Then the "development" of the country went along the following chain: a sharp decline in the human potential index  $\rightarrow$  large-scale corruption  $\rightarrow$  lack of financial resources. The latter factor makes it extremely difficult both to develop existing production facilities and to create new competitive ones. Without investments into production, without long and accessible loans the solution of the problem is hardly possible, and we have the situation when the amount of Bank interest exceeds the rate of return in most industries. And in case the access to these loans is ensured, at the same moment the placement of this money in the financial markets should be prohibited. Thus, again we are at variance with the model of liberal economy, for which speculations limiting is equal in importance to our hands raising to the Holiness , whereas without large-scale production investments Russia's economy is doomed to demonstrate "growth" at the level of statistical error.

# 2 MODELING OF STABILITY AND ECONOMIC GROWTH

When considering the issues of modeling we have essentially two options for the economic systems formalization.

These are computable models of General economic equilibrium, known in foreign literature as Computable General Equilibrium models (CGE-models) [8-16] and input-output models (IOM) [17].

The first belong to the class of agent models and represent a system of nonlinear algebraic equations written for the year under study. The models are digitized, calibrated to match the gross issues of agents with official statistics. Models are digitized, calibrated to match the gross releases of agents with the official statistics. The second, when they are written in the form of a high-dimensional system of algebraic and differential equations, open up broad opportunities for the analysis and optimization of their intrinsic dynamic properties (IDP) of economic systems.

The central part of the database for digitization of both models is the base tables "input-output" (IOT), which for the Russian economy in 2011 appeared on the Rosstat website in the tab "National accounts  $\rightarrow$  table "input-output" 18.04.2017, the dimension of symmetric IOT being equal to (126×126).

After the CGE – model calibration, the procedure for the point of General economic equilibrium determination in accordance with the Valras theory is launched [18]. CGE-models are based on the neoclassical economic theory, and its provisions are not always implemented in modern Russian economy. In the conditions of human capital erosion and of the PMD imperfection, endless arbitrariness of monopolies and financial speculation, unconfirmed economic growth, low inflation due to the "drying" of demand and other negative factors, the CGE models are being completely transformed into an instrument for writing research works and qualification works, building an academic career or the one of a teacher. And this iterative process may well converge to a point that does not exist in the real economy.

The validity of the CGE models application can be ensured on the basis of the IDP economy analysis, which can be harmonized with the provisions of the neoclassical economic theory. If the structural readiness of the system for extended reproduction is established in this way, it increases the confidence measure to the results of CGE-modeling.

When speaking of IOM we mean Leontief's model of the type

$$X(t) - AX(t) - BpX(p) = Y(t), \ X(0) = X_0,$$
(1)

where  $p = \frac{d}{dt}$  is the operator of differentiation, A - the matrix of direct production costs coefficients, B - the matrix of increasing stock capacities coefficients, Y(t)-the vector of final demand (consumption), X(t) - the vector of gross issues by economic activity (IEA), and the vector BpX(p) - characterizes the dynamics of accumulation/reduction of all types of "capital" in the context of FEA.

This model is easily closed for consumption and leads to a normal form of Cauchy with degenerate matrix B [19, 20], acquiring the form of:

$$pX_1 = GX_1, \quad X_1(0) = X_0,$$
 (2)

where G- is a square matrix of dimension  $(n \times n)$ , and n- is the number of differential equations in (1). Now the question of structural stability is solved as follows: the system possesses IDP with the potential for economic growth, if the spectrum of the matrix G has one positive eigenvalue, let's denote it  $\alpha_m$  (this is one of the IDP indicators), which a positive eigenvector corresponds to. This is the minimum number modulo called the degree of economic growth, and its own vector corresponding to it sets the proportion of investment in foreign economic activity FEA.

Bringing the economy to the state of structural stability is possible due to the investment efforts changing the balance sheet models parameters (1), (2) and, accordingly, the spectrum of eigenvalues location in the complex plane. To simulate the process of restructuring is possible through the use of optimization procedures to IOM models. In the process of numerical search it is possible to control the group motion constituents, which are characterized by eigenvalues of the state matrix G. To do this, the auxiliary function is minimized

$$F = \min_{U_m > 0} (\alpha_0 - \alpha_m)^{\nu} + \min \sum_{\substack{\alpha_i \neq \alpha_m \\ \alpha_i \leq \alpha_0}} (\alpha_\partial - \alpha_i)^{\nu}$$
(3)

where  $\alpha_0$  - is the desired degree of economic growth, and  $\nu$  - the integer exponent, usually taken as equal to 2; the right eigenvector of the matrix *G* corresponding to  $\alpha_m$ ;  $\alpha_i$  - real parts of the eigenvalues, *G*, taken with the opposite sign;  $\alpha_{\partial} > 0$  - the specified value of the damping index of motion components.

It was V. Leontief who pointed out that a positive degree of economic growth will eventually subdue other components of the movement and the economy will stay on the path of balanced growth. Of course, Leontief had in mind the fulfillment of both necessary and sufficient conditions for this growth: perfect PMD and the absence of limitation on resources.

Function (3) has mathematical properties of continuity and differentiability necessary for successful operation as part of optimization algorithms. Its minimization leads to the structural development of the economy to the main trajectories that the researchers, headed by George von Neumann in the twentieth century called the infinitely optimal. This is how the impact of investments on the dynamic properties of the economy is simulated. These properties are defined by eigenvalues that are localized on the complex plane by a segment of the real axis  $[\alpha_0; -\alpha_{\partial}]$  and the corresponding vertical lines.

Eigenvalues that are outside this part of the complex plane, do not belong to the managed group and do not participate in optimization until , while varying the parameters of the model (1) do not cross the vertical straight lines with abscissas  $\alpha_0$  or  $[\alpha_0;-\alpha_c]$ . That is, the number of eigenvalues forming the function (3) may change during the optimization process, the degree of economic growth will strive for the desired value, the other components of the movement, including cyclic ones, are damped.

Thus, the auxiliary function (3) solves the two-fold problem of IDP optimization: maximizing the degree of growth and damping of vibration movements in the economy. So, formally, the purpose of the numerical search is to remove the eigenvalues of the system state matrix (2) from the strip of the complex plane cut out by the segment  $[\alpha_0; -\alpha_{\partial}]$ : the degree of growth  $\alpha_m$  to the right of the strip, other eigenvalues with real parts  $\alpha_i$  – to the left of it. If it is impossible to solve this problem, the search method will do the maximum possible in the direction of its solution. Here is an example of the practical implementation of the theoretical provisions. To do this, we will use the already mentioned basic IOT and the data from the compendium "National accounts of Russia in 2001-2016". We have performed the aggregation procedure of the model from the original dimension (126×126) to the correct scientific article dimension (15×15) and have balanced the model.

In fact, CGE models also undergo calibration procedures - without this the gross issues of agents do not coincide with the official statistics. Table 1 shows some eigenvalues of the matrix *G* for two cases – before (second line) and after (third line) optimization, during which the growth rates and damping level indicators were taken as  $\alpha_m = 0,1$  and  $\alpha_{\partial} = 0,05$  respectively.

№	1,2	3	4	5	6	7	8	9	10	11
$\lambda_i$ before	-0,056± <i>i</i> 0,005	-0,043	-0,039	-0,036	-0,027	-0,003	-0,002	-0,002	-0,001	+0,1 <i>e</i> -07
$\lambda_i$ after	-0,055 -0,054	-0,043	-0,042	-0,041	-0,040	-0,040	-0,039	-0,039	-0,038	+0,011

Table 1. Eigenvalues before and after optimization.

We have kept the FEA and the products with codes in the classifier of economic activities (GCFEA) from A to O.

The elements of the matrix A corresponding to the five products with the highest value added were subject to variation according to the above-mentioned statistical compendium in the range of  $\pm 10\%$  of their initial values. This is quite possible if the economy is reported the investment impulse equal, according to our estimates, to about 20% of GDP in the prices of the same year 2011. The analysis of Table 1 data allows us to see that rhythmic investment efforts will allow us to have an economy with growth potential. With regard to it, the development and application of CGE models is justified, promising and opens up broad opportunities for the formation and evaluation of economic policy options, research conditions for sustainable economic growth.

# **3** CONCLUSION

The economy, which has a spectrum of eigenvalues for the second option, has the potential for economic growth, it is structurally ready for it. However, this is not enough. The growth of the economy, which should finally be followed by welfare growth, will not start automatically. It is necessary to carry out, speaking mathematical language, all necessary and sufficient conditions. The key of these conditions is the production investment. Let us allow ourselves another explanatory table compiled according to Rosstat data.

(2008 – adopted to 100 /6)							
Indicator	2012	2014	2016				
GDP	100	96,3	104,0	105,8	102,6		
Industrial production	100	95,8	104,4	106,2	98,2		
Investments into fixed assets	100	91.9	108.8	108.0	98.0		

Table 2. Relative changes in some macroeconomic indicators for 2010-2016(2008 – adopted to 100%)

It is impossible to count on economic growth in the context of such "dynamics" of industrial production and investments in fixed assets, or, to be more precise, in the conditions of "trampling on the spot". It is pointless exactly the same as a useless dream is the expectation of large-scale private investment or investment of deposits of individuals at the time when the government persistently reduces its own participation in investment activities. Thus, the share of firms with stateowned and mixed ownership, with almost constant total investment in fixed assets, has steadily decreased from 32.5% in 2008 to 25.4% in 2015.

Private investments in government securities (GS) has been more reliable (no risk, stable returns) than investments in fixed assets. This is what the government has achieved in its attempt to solve the problem of the balance of the Federal budget by purely financial methods, which are reduced to the emissions and to these securities placement.

Structural reforms and the economic growth have nothing in common with the government's focus on financial and value instruments for the economic activity regulation. Firms are unwittingly drawn into these processes, begin to pursue an increase in the financial results of the current time to a greater extent than to take into account the actual problems of production.

As a result, if according to Rosstat data in 2008 the volume of investments in fixed assets exceeded the cost of GS by 8 times, in 2014 this ratio decreased to 3. Thus, there is a growth and priority of financial investments of the companies and a steadily low proportion of investments in fixed assets, without which economic growth does not happens.

We have already found out that production potential determines production opportunities and this is an important component of the potential for economic

growth. And the above described situation in the sphere of investment activity has a negative impact on both. We have already seen that depreciation of fixed assets in the economy has passed the "psychologically important mark" in 50% in 2016, at the same time, the coefficient of renewal of fixed capital decreases: in 2008 it was equal to 4.4%, and in 2015 it decreased to 3.9%.

Maintaining such a state of affairs in the field of investment will allow for some time to support the economy in a simple reproduction mode, with the prospects for its decline in the near future.

In conclusion we should note that in these conditions, the hope for small business, farming in agriculture, consumer cooperation is useless and meaningless. These "small forms" in crisis-stagnant periods of economic history may be in demand as a way of survival, but will never create the potential for economic growth, will not provide jerks in technical and technological terms. They cannot act as locomotives of economic development by their nature; they are not self-sufficient and economically stable subjects. Only in the service sector small businesses can dominate. In the sphere of production and science, they are of an auxiliary nature and will never form a vector of the country's economic prospects.

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#### 现代人事管理系统中雇主的人力资源品牌

#### HR-brand of the employer in the modern system of personnel management

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目前的商业发展趋势是劳动力市场的旧策略和工作形式变得越来越不有效。 雇主之间的竞争越来越激烈,对候选人专业知识水平,技能和技能的要求越来越高。 对于申请人而言,除了物质报酬外,公司的内部结构变得重要 - 组织准备为员工的个人发展和发展提供的工作条件和机会。 雇主之间出现了新的竞争 - 一个形象或其他人力资源品牌。

关键词: 人力资源品牌人力资源管理竞争力发展

Annotation. Current trends in business development are such that the old strategies and forms of work in the labor market are becoming less effective. The competition among employers is growing, the requirements to the level of professional knowledge, skills and skills of candidates are increasing. For applicants, in addition to material remuneration, the internal structure of the company becomes important - the working conditions and opportunities that the organization is ready to provide for the personal development and development of employees. There was a new level of competition among employers - an image or otherwise HR brand.

Keywords: HR brand, HR management, competitiveness, development.

In order to understand the role played by HR branding in the corporate human resources management system, what is its role in the large enterprise management system, it is necessary to consider the essence of this phenomenon, as well as aspects of the formation of such a research direction as HR-brand.

HR-brand, or employer branding, as an aspect of scientific research has entered science relatively recently, but in recent years a sufficient amount of work has been devoted to it. This provision is conditioned by the fact that as a result of practical developments the economic effectiveness of the HR brand for various participants in labor relations has been proved.

Pioneers in this field were British researchers, who in the 90s of the 20th

century for the first time turned to the issues of consideration of the HR brand. The founder of this direction was Simon Barrow. In 1996, together with Tim Ambler, a senior researcher at the London Business School, they uncovered the essence of the HR brand in an article in the Journal of Brand Management. At the current stage many well-known world corporations pay attention to the construction of the HR brand, recognizing its profitability and significance.

The Russian history of HR-branding began later. Research on this issue was carried out by well-known Russian scientists, in particular L.I. Ivankina, N.M. Abramov, A.A. Bezovets, D. Lobanov, A.Ya. Kibanova, E. Balashova, D.G. Kucherova, N. Osovitskaya and others. In addition, such a large number of publications on this topic can be found in such magazines as HR-JOURNAL, HR Director, HeadHunter website, etc. In addition, in Russia since 2006, the "HR-brand of the year" award is awarded, which today has an international status [http://hr-brand.ru/]. Abroad there are similar awards, for example, "Best Company to Work For", "Best Employer", etc. The existence of a separate system for evaluating the employer's brand in Russia shows the significant interest of various participants in labor relations in this issue.

Thus, the review showed that at the current stage, HR-branding issues are given considerable attention. Consider the essence of this phenomenon.

Author	Interpretation
C. Barrow T. Ambler	Employer branding is a combination of the company's efforts to interact with existing and potential employees, which makes it an attractive place of work, as well as active management of the company's image in the eyes of partners, potential employees and other key stakeholders [3].
O. Brookovskaya N. Osovitskaya	HR branding is the way in which the identity of business is formed, starting with the basic foundations and values, and the tools by which it is conveyed to stakeholders.
V.D. Mishina	HR-branding is the process of creating a favorable image of the employer with the help of specific tools, the action of which is directed at the external and internal audience
R.E. Mansurov	HR-branding is a complex of purposeful activities aimed at forming a positive image of the employer in order to constantly attract the best of the best specialists in its field
T.Yu.Arkova	The way that a business builds its identity, starting with the basics and values, and how it communicates it to all stakeholders. The system of images, ideas and representations about the organization broadcast by the external and internal audience of the organization as an employer

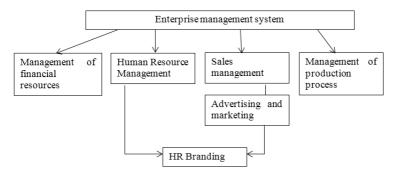
Table 1. Interpretation of the concept of HR-branding in the studies of	
various authors	

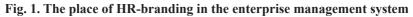
 $Continuation \ of \ the \ table \ on \ the \ next \ page$ 

S.M. Ivanova	A well-known image that exists among employees and potential employees of the organization, the public, representatives of the professional community, recruiting companies, government services (eg employment), commercial companies in relation to an organization that has unique qualitative characteristics in the labor market, brought to the consciousness of existing and potential employees way, so that once applying for work in this organization, they became its adherents.
A.A. Dvornikov	HR-branding is a way to attract qualified employees, but not with money, but by creating a more attractive image of work in the company

Thus, having considered the concept of HR-brand and HR-branding, we can draw the following conclusion about the essence of these phenomena. First, the HR brand is a special image of the company, formed in the eyes of various interested categories of people, including real, former and potential employees, stakeholders, customers, partners, etc. Secondly, this formed image is a collection of various benefits and advantages of economic, professional and psychological nature that can be obtained by the interested person by joining the chosen company. Thirdly, HR-brand represents a unique feature, due to which the company's distinctiveness is formed from others for the external circle of persons and for interested participants. Fourth, all the methods, ways and ways in which the HR brand is realized and its formation is exactly HR-branding.

HR-branding is a very important process in the enterprise management system. In general, the place of HR branding in the enterprise management system can be represented in the form of a scheme (Figure 1).





The process of enterprise management consists of several separate areas: sales, production, financial resources and flows, information resources, etc. There are a lot of data spheres, all of them can not be displayed in the same scheme, especially for each enterprise their set will differ. But in essence, HR-branding combines two separate areas in the sphere of management at the enterprise. It combines elements of marketing and personnel management. It is at the junction of these two areas that HR branding is formed. Consequently, technicians, technologists and methods of its formation also represent sets of methods and techniques from two given areas.

Next, we need to consider the basic elements of these concepts. The employer's brand is formed from two components - internal and external. It is the person to whom the brand is addressed that determines its composition. A diagram of the interaction of the two components is shown in Figure 2.

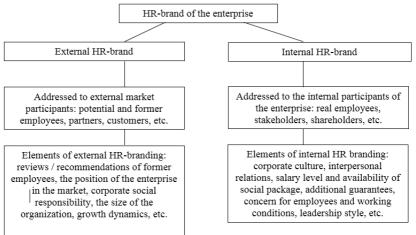


Fig. 2. Composition of the company's HR-brand

Internal HR-branding largely determines the external. The labor market does not always trust the official information of the company. According to a number of studies, about 75% of people are sure that advertising is deceiving. At the same time, the potential candidates are trusted to a much greater extent by the reviews of current and former employees. The way a company looks in the eyes of candidates is largely determined by the way it looks in the eyes of employees. This influence also can not always remain spontaneous, there are also quite common tools of mutual influence of internal and external HR-brands. For example, a bonus system for recommendations. Attracting acquaintances to work in the company, employees of the company strengthen her image as an employer, and this is encouraged.

You can not underestimate the role of work with outgoing employees - after all, their feedback often creates a negative opinion about the company. Correctly conducted final interview, resolution of all disputed issues, assistance in further employment turn former employees into loyal conductors of company's HR-brand [4, p. 64-66].

External HR-branding is focused on professionals who are still on the other side of the company, that is, potential applicants. Speaking marketing terms, candidates are in this case the target audience. Any company has to position itself as an employer: on job search sites, message boards, in print, in recruitment agencies, etc. However, not everyone does it thoughtfully, in accordance with the built-in concept of forming the employer's brand. Often companies simply publish vacancies on job-sites when they need new employees, or update a corporate site to attract students, or print booklets if it is necessary to present themselves at the job fair [3, p. 150]. In Russia, these actions are not always considered, the ads attract the target audience, and the opinion of potential employees is true.

Based on the foregoing, the formation of the company's HR-brand is important, both for potential employees, partners and customers, and for real employees, shareholders, stakeholders. It is important to have a well-formed and thoughtful image that will be part of the overall strategy of the enterprise. Formation of HRbrand is more labor-consuming and less spontaneous process, it needs carefully verified actions and, first of all, in detailed study of the target audience. When developing the concept, in accordance with the goals and objectives set, specific tools for influencing the audience are selected: the ways, forms and channels for delivering information. Recently, more and more experts are talking about the need to segment the target audience of candidates and placing the appropriate emphasis in the message of the HR brand. Thus, the research of Employer Brand International shows that such factor of employer choice, as the presence of a flexible work schedule, is six times more important for women than for men. A cheerful atmosphere, the mood of the holiday at work - three times more significant moment for the youth audience, compared with candidates from the age group over 50 [1, p. 220].

Defining the role and place of HR-branding in the management of personnel in Russia and abroad, one significant difference can be distinguished. It is clearly represented in Figures 3 and 4. As can be seen from the presented schemes, in the United Kingdom, the United States and a number of other countries, leading companies are introducing HR-branding into their development strategy. It is the most important component of the strategic approach in the enterprise. Creation and development of HR-brand in this case are not engaged in personnel management services, not personnel departments, but the managers responsible for implementing the overall development strategy of the organization. Strongest HR brands are betting not only on products and services, but also on people [2, p. 37-40].

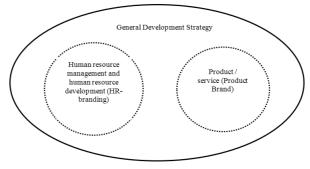


Fig. 3. The ratio of HR branding and development strategy of the enterprise abroad

In Russia, the approach to creating and developing the HR brand is somewhat different. HR-branding as such is the task of HR-service, the marketing department, but not the units that carry out strategic planning in the organization. It is not included most often in the overall development strategy, but acts as a separate element in the management of the organization.

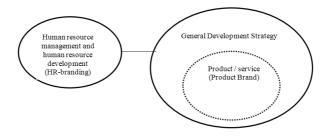


Fig. 4. The ratio of the overall strategy and HR-branding in Russia

Thus, HR-branding as a sphere is at the intersection of two branches - marketing and personnel management. For foreign enterprises, a more ambitious approach to HR branding is characteristic, where it acts as one of the elements of the overall development strategy, whereas in Russia this area is narrower and, as a rule, is allocated in a separate strategic direction.

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# 目标客户群分析在"Kazpromkomplex"LLP Target client group analysis at "Kazpromkomplex" LLP

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Target group analysis of a company is made based on several indicators and analysis tools: the penetration index (PI), net promoter support index (NPS), profitability analysis of potential and loyal clients and customer complaints analysis. These indicators and analytical tools enable, as it appears, to implement successfully the TRI\*M system of management in order to measure customer loyalty and satisfaction level at a certain company. The object of the study is "Kazpromkomplex" LLP, a real functioning company in the country involved in the business of the metallurgical industry.

Before proceeding ahead, it is important to clarify some abbreviations and terminology:

The penetration index (PI) - a parameter that indicates the rate of product or service circulation on the market.

Net promoter support index (NPS) - the index of determining the adherence of clients to a product or company (the willingness index to recommend) is used to assess the readiness for repeated purchases.

The concept of life time value (LTV) - the value of the client throughout his/ her relationship with ta company. LTV represents the expected net profit that this customer will bring to the company for the period of the relationship's continuation.

# The penetration index (PI) analysis

The penetration index (PI) of the client is considered in the quality of loyalty of the key figures. This is a great way to raise a company's reputation in the business community, expand customer service and increase the customer satisfaction by building customized users.

This group represents a percent corresponding to the purchased categories,

depending on the group to which one intends to share the group. PI represents a significant fraction of the market share representation in the formula:

Market share = Penetration index (PI) x needs share x Index of an active use

When calculating the PI, it was considered as an equivalent to the natural characteristics (tonnes) and was calculated with the use of the following formula:

PI = supply share/Consumption gross volume

The aim of the PI study has been to identify the impact of the supply share in the general consumption volume among "loyal" and "potential" clients of the company after the introduction of the client oriented technology at "Kazpromcomplex" LLP [2].

This way the penetration index situation among metal - consuming customers of "Kazpromcomplex" LLP in dynamics has been studied in the following cities of the Republic of Kazakhstan: Astana city in the period from 2013 to 2016, Shymkent city from 2010 to 2015, Pavlodar city in the period of 2010-2015 and Aktobe city the period of 2010 to 2015 (see Tables 1 - 4).

Client type	2013	2014	2015	2016
Loyal	19%	27%	31%	42%
Unstabilized	17%	28%	28%	15%
New	17%	20%	20%	40%
Potential	14%	12%	13%	17%
Committed	86%	88%	99%	60%
Stabilized	59%	80%	136%	52%
Departed (Non- retained clients)	14%	38%	19%	8%

 Table 1. Penetration index dynamics analysis results (in percentage) in

 Astana city

Note: the need for rolled metal products has been identified among 162 clients of the target group.

Based on the results of the analysis, there is an increase in the level of the Penetration Index in the "loyal" subgroup within 3 years in the range of 15-30%. Reduction of the level of PI of committed customers to 60% in 2016 is due to the preventive sequestration of the company's budgets in 2014-2015, the early reduction of staff, including sales managers, and is due to the general economic instability and the economic crisis in Kazakhstan in 2014-2015. However, it should be noted that there is a retaining level of client loyalty in the period 2014-2015 against the background of negative forecasts of Kazakhstan's economy.

Client type	2010	2011	2012	2013	2014	2015
Loyal	50%	52%	62%	64%	63%	40%
Unstabilized	57%	60%	67%	54%	52%	55%
New	52%	75%	51%	42%	63%	51%
Potential	71%	52%	50%	46%	52%	54%
Committed	38%	49%	73%	61%	54%	45%
Stabilized	74%	77%	67%	64%	62%	37%
Departed (Non-retained clients)	48%	65%	63%	41%	52%	32%

 Table 2. Penetration index dynamics analysis results (in percentage) in

 Aktobe city

Note: the need for rolled metal products has been identified among 162 clients of the target group.

Based on the results of the analysis, there is an increase in the level of the Penetration Index among the "loyal" group in the range of 16-20% during 2010 - 2013. In the "potential" group, there is a decrease of the PI associated with the weakening of the control of the Active Group (according to the observations of the managers of the sales department).

The decrease of IP in the period of 2014-2015 was characterized by losses in the 1st and 2nd subgroups and the adoption of an early decision to exit the company from the Aktobe market.

Client type	2010	2011	2012	2013	2014	2015
Loyal	31%	44%	49%	69%	62%	57%
Unstabilized	73%	70%	76%	62%	75%	56%
New	70%	83%	65%	64%	69%	38%
Potential	28%	34%	55%	57%	58%	47%
Committed				84%	84%	36%
Stabilized	39%	38%	46%	46%	74%	64%
Departed						
(Non-retained clients)	67%	60%	78%	48%	62%	70%

Table 3. Penetration index dynamics analysis results (in percentage) in<br/>Pavlodar city

Note: the need for rolled metal products has been identified among 457 clients of the target group.

in Sny inkent city						
Client type	2010	2011	2012	2013	2014	2015
Loyal	66%	82%	88%	90%	85%	88%
Unstabilized	84%	82%	76%	79%	74%	70%
New	48%	49%	63%	68%	81%	73%
Potential	61%	77%	84%	85%	71%	77%
Committed	61%	84%	88%	88%	83%	92%
Stabilized	65%	78%	72%	76%	84%	85%
Departed (Non-retained clients)	66%	73%	75%	84%	18%	49%

 Table 4. Penetration index dynamics analysis results (in percentage)

 in Shymkent city

Note: the need for rolled metal products has been identified among 162 clients of the target group.

# Profitability analysis of potential and loyal clients

Profitability management covers monitoring of statistics in three areas: the organization as a whole, products and clients. Profitability indicators are needed because they help to allocate resources, apply cost control and monitor the performance of managers. Measuring the profitability of products provides the basis for identifying problems, generating revenues, setting prices, and assessing the effectiveness of services and the managers who serve customers.

Determining the profitability of clients allows one to concentrate efforts on the most important segments of the clientele, to achieve a high level of attracting and consolidating it, to increase stability and quality of receipts. Moreover, the profitability statistics is aggregated to facilitate management decisions.

This study covers the analysis and monitoring of profitability of clients at "Kazpromkompleks" LLP [2]. Profitability analysis of "potential" and "loyal" metal purchasing clients was held in the following cities of the Republic of Kazakhstan:

Aktobe city in the period of 2008-2015, where 1952 clients were investigated;

Shymkent city in the period of 2011-2015, where 758 clients were investigated;

Pavlodar city in the period 2009-2015, where 1,526 clients were investigated; Astana city in the period 2008-2016, where 4049 clients were investigated.

The purpose of this study is to reliably determine the most profitable and prospective client segments as target, to anticipate their needs and behavior, to offer the necessary products with the proper delivery method. The notion of "long-term client value" arises, which involves taking into account the establishment and development of versatile relationships with target clients, the concept of Life Time Value (LTV) and the RFM approach (Recently, Frequently, Monetary value - F. R. M). Its essence consists in modeling the client's behavior taking into account the probability of his/her repeated visits (measured by the time in days after the last visit to the company or visits to the site), the frequency of attendance and the volume of the purchases. That is, those clients who recently and often visited the company for large purchases are the most likely candidates for responding to the offer of new products and services. Accordingly, these clients are the most profitable in the long-term plan, as their willingness to buy more and more actively is higher.

The research of the target client group of the company is divided into two subgroups:

First subgroup, received a conditional name "Potential" and united clients who are new / left / potential /unstabilized.

Second subgroup, received a conditional name "Loyal" and united clients who are stabilized / loyal / and committed.

It should be noted that these studies were conducted under the condition of an equal level of profitability for all years, to exclude incorrect statistics and impulse revenues (see Tables 5, 6, 7, 8).

# Table 5. Analysis of subgroups' profitability share (in percentage) comparedto the company overall profitability in Aktobe city

Year	1st subgroup	2nd subgroup
2008	88,40%	11,60%
2009	85,20%	14,80%
2010	64,60%	35,40%
2011	53,80%	46,20%
2012	57,40%	42,60%
2013	30,70%	69,30%
2014	63,60%	36,40%
2015	336,70%	-236,70%

Based on the above results, it may be concluded that for the first time in 3 years of the company's development, the ratio of the profitability of attracted clients in the "Potential" group was approximately classical to - 80/20.

In 2011, as a result of the introduction and compliance with structured sales technology, the ratio is equalized to 50/50. Achievements of the technology peak and profitability towards "Loyal" clients level was reached in 2013 to a figure of 30/70, which indicated the efficiency of client-oriented technology, while respect-

ing loyalty programs.

The final period of 2014 was an indicator of the systemic crisis in the country and the influence of devaluation, despite this the company kept the indicators within the same ratio by inertia.

However, the period of 2015 was characterized by losses in the 1st and 2nd subgroups and the adoption of an ad-hoc decision to exit the company from the market.

Year	1st subgroup	2nd subgroup
2011	52,10%	47,90%
2012	20,20%	79,80%
2013	8,40%	91,60%
2014	18,80%	81,20%
2015	39,00%	61,00%

 Table 5. Analysis of subgroups' profitability share (in percentage) compared to the company overall profitability in Shymkent city

Based on the above results, it may be concluded that in the end of the first year of the company's development, the ratio of the profitability of attracted clients in the "Potential" group was approximately 50/50. This indicator indicates a high degree of correctness of the introduction of client-oriented technology. In the subsequent years the ratio was set at 20/80 and even a peak of 10/90 was achieved in 2013.

The final period of 2015 was characterized by the systemic crisis in the country, including the devaluation in 2014, despite this the company kept the indicators within the equal proportions by inertia

 Table 7. Analysis of subgroups' profitability share (in percentage) compared to the company overall profitability in Pavlodar city

Year	1st subgroup	2nd subgroup
2008	88,40%	11,60%
2009	85,20%	14,80%
2010	64,60%	35,40%
2011	53,80%	46,20%
2012	57,40%	42,60%
2013	30,70%	69,30%
2014	63,60%	36,40%
2015	336,70%	-236,70%

Based on the above results, it may be concluded that for the first time in 3 years of the company's development, the ratio of the profitability of attracted clients in

the "Potential" group was approximately classical to - 80/20.

In 2011, as a result of the introduction and compliance with structured sales technology, the ratio is equalized to 50/50. Achievements of the technology peak and profitability towards "Loyal" clients level was reached in 2013 to a figure of 30/70, which indicated the a efficiency of client-oriented technology, while respecting loyalty programs.

The final period of 2014 was an indicator of the systemic crisis in the country and the influence of devaluation, despite this the company kept the indicators within the same ratio by inertia.

The period of 2015 was characterized by losses and the adoption of a decision to exit the company from the market.

Pavlodar city and Aktobe city markets were characterized by similar indicator results which in turn proves the consistency and identity of compliance with the technology of introducing client orientation in the metal trading market of the Republic of Kazakhstan.

Year	1st subgroup	2nd subgroup
2008	62,10%	37,90%
2009	46,20%	53,80%
2010	20,60%	79,40%
2011	48,90%	51,10%
2012	39,60%	60,40%
2013	31,50%	68,50%
2014	37,70%	62,30%
2015	66,30%	33,70%
2016	71,90%	28,10%

# Table 8. Analysis of subgroups' profitability share (in percentage) compared to the company overall profitability in Astana city

Based on the above results, it can be concluded that at the end of the first year of the company's development, the ratio of the profitability of attracted clients in the group of "Potential" clients was approximately 60/40. This indicates a high degree of correctness of the introduction of client-oriented technology. The following year 2010 was established at the level of 20/80, which indicates the effectiveness of the introduction of the client-oriented technology.

The decrease in profitability in the "loyal" subgroup of 2011-2014 and the setting of the indicator with a ratio of 40/60 was due to the economic growth in the region and in particular the increase in the number of new construction companies in the market of Astana city.

Analysis of the Net Promoter Score (NPS) Support Index [1]

1. Customer loyalty analysis (NPS) as of 24-02-2015.

The survey involved 292 clients, the result of NPS = 10%

the average NPS for the market of small companies is 16% in the US (research by Reicheld method).

2. Customer loyalty analysis of as of 24.01.17. The survey involved 358 customers, the result of NPS = 37%

### Analysis of customer complaints in the period of 2015 - 2017

In the analysis of clients complaints on the quality of the company's work, 455 "events" were investigated in the client card for three years in the Enterprise Resource Planning (ERP) system of "Kazpromcomplex" LLP [2].

The process of filling in events by the manager begins with a contact and a description of the outcome of the negotiations in the account of the "event" in the client's card, followed by a comprehension and description of the "reflection" in the client's card.

- In the event card, the process and the result of negotiations with the client are filled.

- Fill in the name of the client, contact person.

- Standard content is selected (what actions will be taken now with the client).

- The event sub-type is selected as the manager contacted the client.

- In the "Analysis/Reflections" the negotiations with the client are filled in (convenience of work, problems in the transaction, and offers of clients).

- In the last paragraph (result), the results of the negotiations are filled and the outcome of the event is chosen, what has become the outcome of the negotiations (positive or negative).

2015	N of inci- dents	2016	N of inci- dents	2017	N of inci- dents
Not satisfied with the price	46	Not satisfied with the price	85	Not satisfied with the price	88
Do not sell without payment	36	Do not sell without payment	46	No sales without payment	60
Claims on the product quality	8	Not available	5	Broken relations	7
Not available	7	Broken relationships	9	Underloading problem	4
Broken relationships Underloading	5	relationships Claims on the product quality Problems with	5	problem Claims on the product quality	3
Underloading problems	2	Problems with underloading	5	No discounts	2

Table 9. Types of complaints and the number of incidents for the years2015, 2016 and 2017

International Conference

Conflicts during	1	Contract approval	2	Claims on the	2
delivery		problems		product quality	
Refusal to load without VAT	1	The weight of the product is higher than stated	1	Contract approval problems	2
		Do not work with us due to trial	1	Deadlines have not been met	2
		Conflicts due to debts (account receivables)	1	The product not available	2
		Conflicts with the legal office	1	Do not work with us because of the trial	2
		Broken relationships due to the trial process	1	Long wait period during upload	1
		Deadlines have not been met	1	Supply long wait period	1
		Not contacts from the managers, no phone calls	1	A long period of consideration	1
		Not satisfied with a frequent change of managers	1	Refused to ship without VAT	1
		Not satisfied with payment conditions	1	Production time is long	1
				Broken relationships due to the trial process	1
				Delivery conditions are not suitable for the company	1
				Conflicts during delivery	1
				Claims on the quality and quantity	1

For the period 2015-2017 there is a high share and persistent dissatisfaction of the client with prices and a lack of shipment of rolled metal in debt. The dissatisfaction data should be regulated by the Regulations on "Receivables" and "Pricing and discounts". Also, a slight increase in the claim for undercharges in shipment from 2 to 4 complaints was apparently related to an increase in the company's overall productivity.

There is a positive moment in the claims for the quality of the goods and reducing it from 8 to 3 complaints. The emergence of problems on the agreement of contracts, the timing of execution, lack of availability and change of managers indicates a significant systemic flaw in the process regulation of the sales structure.

Moreover, a calculation of the total average purchase sum is made for a qualified customer analysis and customer orientation in the sphere of metal trade. Obtained data of the study have served as indicators in the formula that estimates LTV:

- average cost of the purchase by a single client;

- the number of purchases made in a year;
- the number of purchases in years (how long);
- expenses to attract the client;
- cost of the customer service;
- client outflow coefficient.

This way, a calculated cost of "Kazpromkomplex" LLP for the period 2011 - 2016. For 5 years the price was 60 600 USD and the average cost of construction is 1620 USD. Total number of Clients 977. The total amount of orders for one client was varied from 1 to 135 [2].

## *Methodology of TRI* \* *M system in management of loyalty and customer satisfaction at "Kazpromkompleks" LLP.*

As a result of the client-oriented research in the metallurgical industry, the TRI \* M methodology in "Kazpromcomplex" LLP proved its validity and was adapted to practical applicability. In order to find out the brand's recognition and customer-orientation, the company implemented monitoring of indicators and a survey among clients [3].

The study of clients showed that TRI\* M Index equals 101. Unfortunately, in the absence of industry experiments of this index, this indicator can be taken as the standard for the Kazakhstan metal trading market. During the survey 256 clients responded to the questionnaires [3].

The customer survey was conducted at the operational interaction with the accounting documents, through answers to questions via the Samsung tablet (model number SM-T230). The results are shown below [4]. 1. Please rate from 0 to 10 points, how much are you ready to recommend our company to your friends/ acquaintances?

10 points - 171 clients / (79%), 9 points - 12 / (5%), 8 points - 9 / (4%), 7 points - 7 / (3%), 6 points - 1 / (0%), 5 points - 9 / (4%), 3 points - 2 / (0%), 2 points - 2 / (0%), 0 points - 1 / (0%).

From the first survey the following data appears:

1. Critics (from 0 to 6) account for 4% of the total number of respondents (dissatisfied customers).

2. Neutrals (7-8) are 7% - satisfied, but indifferent customers who can change their preferences.

3. Promoters - (9-10) make up 84% - loyal customers who will continue to buy products and recommend it to others.

Based on the survey, one can calculate the NPS index which equals 80%.

2. Based on your experience, how likely are you to contact our company in the future?

For sure will contact - 175 (82%)

Rather "yes" than "no" - 30 (14%)

Unlikely - 6 (2%)

3. How would you rate the overall performance of the company?

High - 147 clients (69%), above average - 43 clients (20%), average - 17 clients (8%), low performance - 3 clients (1%), Low-middle - 2 (0%).

4. How would you evaluate the advantage of using our services in comparison with the services of other companies?

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High - 146 (68%)
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Above average - 46 (21%)
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Average - 13 (6%)
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Low - 4 (1%)

Lower-middle - 3 (1%).

Adaptation of the coefficient of customer resistance was carried out in the conditions of the target client group of "Kazpromcomplex" LLP for the quarter of 2017.

The mechanism for distributing the roles of clients and significance according to the TRI \* M Typology between 579 target client group is taken from the classification of the company's clients.

The ambassadors of the company were loyal and stable customers, which is 21% of the total number of clients according to the classification of clients at "Kazpromkompleks" LLP.

To the "hostages" clients committed clients were referred (5%).

Potential customers were referred to mercenaries and the share is 32%.

Unstabilized customers were referred to the "terrorists" and the share is 42%.

The total ratio of client resistance was 42 \* 11/21 \* 16 to = 1.38.

This indicator is low due to low satisfaction and customer loyalty which is 47% and 74% respectively. Unfortunately, due to the lack of such studies in the metallurgical or industrial sectors, this indicator can not be used as an industry standard.

Comparability of such polar data obtained, as a result of a survey of 107 clients and the target client group data, is apparently due to the fact that loyal customers left positive comments in the poll. Therefore, the data of the Typology and the coefficient of client resistance are more objective for the company.

The results of the Index and the coefficient of customer resistance are recommended to be included in the key performance indicators and monitoring of the dynamics of "Kazpromcomplex" LLP on a monthly basis.

This way, the study reflected an attempt of the author of the research to assess the situation related to customer loyalty level, potential client preferences to stay with a company and this has been done based on several indicators and analytical tools: the penetration index (PI), net promoter support index (NPS), profitability analysis of potential and loyal clients and customer complaints analysis at "Kazpromcomplex" LLP. It is still early to say whether the introduction of the client oriented technology at "Kazpromcomplex" LLP has yielded only positive results, however, it may be concluded that further study and observations based on analysis are needed.

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# 俄罗斯联邦和中华人民共和国环境宪法人权的规范性设置和实施问题 Problems of the normative setting and implementation of environmental constitutional human rights in the Russian Federation and in the People's Republic of China

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根据1995年国际环境与发展公约草案(2004年修订),将环境宪法人权的概念引入科学发行。本文件涉及国际"软法",即国家不是强制性的。 然而,可归因于环境宪法人权的权利属于一些州的宪法。本文考察了俄罗 斯联邦和中华人民共和国宪法如何规定这些权利,哪些问题阻碍了它们的 有效实施以及如何消除这些权利。

关键词: 俄罗斯联邦宪法, 中国宪法, 宪法环境人权, 规范性巩固人权, 实现人权。

Annotation. The concept of environmental constitutional human rights was introduced into scientific circulation on the basis of the Draft International Covenant on Environment and Development in 1995 (as amended 2004). This document refers to the international "soft law", that is, it is not mandatory for states. Nevertheless, the rights that can be attributed to the environmental constitutional human rights are in the constitutions of a number of states. This article examines how these rights are enshrined in the constitutions of the Russian Federation and the People's Republic of China, what problems impede their effective implementation and what can be done to eliminate them.

**Keywords**: constitutional law of the Russian Federation, constitutional law of China, constitutional environmental human rights, normative consolidation of human rights, realization of human rights.

*Environmental constitutional human rights in the Russian Federation.* For modern Russia, environmental protection is a serious problem. Environmental law (or the right to protect the environment) is one of the newest branches of modern Russian law. According to Art. 42 of the 1993 Constitution of the Russian Federation, "everyone has the right to a favorable environment, reliable information about her condition and compensation for damage caused to his health or property by an environmental offense." In Art. 58 of the RF Constitution establishes

the duty of each "to preserve nature and the environment, to take care of natural resources"<sup>1</sup>.

The implementation of environmental human rights in the Russian Federation is complicated by a number of factors, primarily the state of the environment. The environmental problems of modern Russia, affecting the implementation of this category of rights include: air pollution, water quality, soil contamination, the existence of objects of accumulated harm to the environment, a high level of wear of hazardous production facilities.

In order to protect the environment and ensure the state's environmental human rights in 2017, the "Strategy for Environmental Safety of the Russian Federation" was approved. It provides for the adoption of measures to regulate greenhouse gas emissions, management of the system of specially protected natural areas, the establishment of an environmental audit system, providing the population with information on the state of the environment and its pollution. The document provides for the procedure for the interaction of government bodies of the Russian Federation<sup>2</sup>.

In our opinion, modern environmental legislation in Russia is not effective enough. The main reasons: inconsistency of the severity of the punishment of the severity of the damage and the difficulty in determining compensation for the damage. In addition, not all offenses against the environment are revealed or come to trial. As noted by DN Dzhunusova, "many cases are terminated at the investigation stage or they are acquitted of acquittals. On the average, 53.3% of those involved in criminal proceedings are convicted "<sup>3</sup>.

A serious reason for the weak effectiveness of environmental legislation in Russia is the inadequate supply of enterprises with technical means for the purification of sewage and contaminated gases, and for the checking organizations - devices for monitoring pollution of the environment.

At the same time, there is another significant problem in the Russian Federation that hampers the implementation and protection of any human rights, including environmental rights - the legal nihilism of the population. Most citizens do not know what rights they have, what are the main environmental requirements, indulgence to violators, lack of skills to assert their rights to a healthy environment.

Thus, in the Russian Federation there is a regulatory framework for ensuring the implementation of environmental constitutional human rights, but the problems that impede it remain.

*Environmental constitutional human rights in China*. According to Liu Hu Yan, China's Constitution establishes a "hidden legal relationship between citizens and the environment," which involves the interrelationship of environmental rights and obligations<sup>4</sup>. This opinion is based on the provision of Art. 51 of the

Constitution of the PRC, which stipulates that the citizens of the PRC should not damage the legitimate rights and freedoms of other citizens, the state and society in the exercise of their rights and freedoms. The Chinese Constitution does not establish environmental human rights as such, but there are a number of rules on the basis of which it can be concluded that citizens of this state have such rights. Thus, Article 9 of the Constitution says that all natural resources are public, state property. The exception is only those objects that are legally collective property (for example, land under residential buildings, personal land and mountain plots, land in villages and suburbs, not belonging to the state (Article 10 of the Constitution of the PRC)<sup>5</sup>.

According to Part 1 of Art. 26 of the Constitution of the People's Republic of China, measures to protect and improve the environment are carried out by the state. He is also responsible for preventing pollution and other violations. Part 2 of the same article says that the state "encourages work on afforestation and gardening, protects forests". Thus, it can be concluded that the state guarantees citizens the right to a favorable natural environment and the right to use it in the manner prescribed by law. Despite the fact that in Art. 35 of the Constitution of the PRC, freedom of speech and the press is enshrined, the right to information, including the right to receive information on the state of the environment, has not been established.

The People's Republic of China has developed environmental legislation, which defines the responsibilities of the state, its bodies and other subjects of environmental law. Since there is always a relationship between rights and obligations, the existence of a duty also speaks about the existence of rights, although environmental human rights, which would be explicitly enshrined in Chinese legislation, are rather small.

Currently in China, as in Russia, there are problems with the environment. There is a high level of air pollution in big cities, visibility on the roads has dropped to a hundred meters. About one-fifth of arable land is polluted. All this creates a real threat to the life and health of the population, thus, it hinders the protection of constitutional environmental human rights.

At present, China is taking a number of measures to remedy the situation. As noted by IV Sablin, China's environmental policy is based on economic and technical measures<sup>6</sup>. In particular, the PRC's environmental policy envisages the implementation of such measures as: the development of promising technologies for environmental protection, the creation of nature protection zones, the activation of environmental education and education, the creation of economic prerequisites for the transition of enterprises to new production standards.

At present, China is reducing excess capacity and this policy is quite successful, as China has made some improvements. However, this is still the beginning

of the road. It should be noted that the decision of the People's Republic of China on its environmental problems is important for the entire region and, above all, for neighboring countries.

Comparing the problems of realization of constitutional ecological human rights, it is necessary to note the commonality of problems facing the states in the sphere of environmental protection. At the same time, their constitutional and legal policy on the protection of the environment and environmental rights is different. Russian legal policy is mainly aimed at the development of legal measures. China's legal policy is based on creating conditions for the development of economic and technical measures. In both countries, the constitutional environmental human rights are fixed, but in different ways. In Russia, there are specific rights with specific powers, and in China their enforcement is carried out through the establishment of duties. From the Chinese legislation it can be concluded that the population has certain environmental rights, but not specific powers, which complicates their implementation.

In our opinion, it will be expedient for China to adopt the Russian approach to the consolidation of these rights, take into account international standards in this area and base our constitutional and legal policy on them. This will promote the development of constitutional and legal regulation of the implementation and protection of constitutional environmental human rights and will positively affect the implementation of environmental protection. It would be useful for Russia to direct its constitutional and legal policy in the sphere in question not only to the development of legal measures, but also to the development of economic and technical measures, as is done in China. In addition, it should toughen responsibility for environmental crimes.

Both states need to monitor the use of natural resources and public health, and make the transition to continuous quality control of the components of the habitat.

The presence of the Russian-Chinese border determines to a large extent the commonality of their environmental problems, including those related to the implementation of constitutional environmental human rights. Therefore, it is advisable to carry out active bilateral cooperation in this area and to establish the corresponding obligations of states in bilateral documents.

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## 由于塞米巴拉金斯克核试验而遭受的哈萨克斯坦共和国公民权利的法律保 护问题

# Some issues of legal protection of citizens' rights of the Republic of Kazakhstan, who suffered in consequence of Semipalatinsk nuclear test

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On the territory of Kazakhstan there is a sufficient number of territories with an obviously unsuccessful ecological situation. This is a complex ecological situation in the zone of the Aral Sea region, which is associated with agrochemical pollution. They significantly worsened the physicochemical properties of the Syr Darya River water and led to a change in the climatic and geographic conditions of the whole region, which had the most adverse effect on the health of the population, the physical sexual development of the younger generation.

In the republic there are large test ranges "Taysoygan" in Atyrau region, "Tashkent-4" and "Baikonur" - near Lake Balkhash. These lands are infected with a poisonous heptyl and the "remains" of missiles. 33.6 million hectares of Kazakhstani lands of the country was put out of action because of the negative influence of military training grounds. On the territory of the republic, 16 billion tons of radioactive waste have been accumulated. These waste in the Akmola region occupy 800 ha, Zhambyl - 190, Zhezkazgan - 25, Kyzylorda - 3, South Kazakhstan - 2 ha. As a result, many facts indicate that large areas of Kazakhstan have become a zone of radiation and other environmental disasters [1].

Semipalatinsk nuclear test site, located at the intersection of three regions of Kazakhstan: East Kazakhstan, Pavlodar and Karaganda, covers an area of 18 thousand square meters. km. During its operation (1949-1989) 466 nuclear tests were conducted on its territory, including 30 ground tests, 88 air and 348 underground nuclear explosions, with 13 explosions causing the release of radioactive gases into the atmosphere. 154 industrial enterprises concentrated in the East Kazakhstan region annually emit into the environment 294 thousand tons of toxic chemicals. For example, in Ust-Kamenogorsk the maximum concentration of heavy metals exceeds the permissible standards: copper, lead, chrome - 100 times, zinc-300, cobalt, nickel-50 times.

According to Article 31 of the Constitution of the Republic of Kazakhstan, the

state sets a goal to protect the environment that is conducive to human life and health. Based on this norm in the Republic of Kazakhstan, many normative acts on the social protection of citizens affected by environmental disasters have been adopted. These are, first of all, the Environmental Code of the Republic of Kazakhstan of 2007, the Law of the Republic of Kazakhstan "On Social Protection of Citizens Affected by Nuclear Explosions at the Semipalatinsk Nuclear Test Site" of December 18, 1992, Decree of the Supreme Court of the RK of June 21, 2001 No. 5 "On the application of art. 13 of the Law of the Republic of Kazakhstan of 18.12.1992 "On Social Protection of Citizens Affected by Nuclear Test Site" [2], etc. The Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan was developed (enacted from 01.01.2018) The standard of the state service "Registration of a one-time state monetary compensation, issue of certificates" [3], where the pores the poison of rendering this public service.

The preamble of the 1992 Law of the Republic of Kazakhstan "On the Social Protection of Citizens Suffering from Nuclear Explosions at the Semipalatinsk Nuclear Test Site" states that tests of nuclear weapons carried out for 40 years at the Semipalatinsk nuclear test site caused irreparable damage to human health and the natural environment, caused an increase in the overall morbidity and mortality of the population.

However, until now, citizens affected by the tests at the Semipalatinsk nuclear test site face problems in legal protection from harm caused to human life and health, providing social protection and rehabilitation of the population living in ecologically unfavorable zones. Thus, Section 6 of the Environmental Code of the Republic of Kazakhstan on the issues of legal regulation of ecological disaster zones consists of two chapters that do not consider ways of getting out of the state of environmental unhappiness, but only give the territory the required status.

With the adoption of the Law of the Republic of Kazakhstan "On Social Protection of Citizens Affected by Nuclear Explosions at the Semipalatinsk Nuclear Test Site" of December 18, 1992 (hereinafter the Law), the amount of social payments indicated in the Law was unreasonably reduced. If in the beginning according to Art. 12 of the Law, the minimum monthly wage acting on the day of granting compensation was the monthly calculated index, then under the Law of the Republic of Kazakhstan "On Amendments and Additions to the Law of the Republic of Kazakhstan" On Social Protection of Citizens Affected by Nuclear Tests at the Semipalatinsk Nuclear Test Site "of 07/07/1999 The words "minimum wage" have been replaced by the "monthly calculated indicator". Subsequently, the additional scholarship payment for the zones was canceled. There were other changes to the law in the direction of worsening the situation of citizens for social protection. For example, the territory of Ust-Kamenogorsk city is attributed by the Law to the zone of increased radiation risk, which means that the population residing on the territory of Ust-Kamenogorsk city has the right to additional labor payment in the amount of 1.5 monthly calculation indicators and an annual additional paid leave in the amount of 10 calendar days.

Despite this, there are cases when some employers began to deny their employees who live and work in the territories affected by nuclear tests the provision of additional wages and leave, explaining the lack of a special certificate confirming the status of the victim. In this connection, there is a need to clarify the correct interpretation and application of Article 13 of the Law, which regulates the social support of the population living and working in contaminated areas. Since the state budget finances only employees of budget organizations and civil servants, therefore, within the meaning of this Law, citizens working in private organizations must be financed from the organization's resources. At the same time, the Labor Code of the Republic of Kazakhstan does not provide for an additional payment of labor for the employer.

In addition, Article 2 of the Law establishes that citizens who leave the specified areas and cities for a different place of residence, who fall under the Law and reside on the territory of the Republic of Kazakhstan, enjoy benefits provided for by the Law. In reality, many employers, including those in the civil service, refuse the above-mentioned citizens (who moved from regions contaminated by nuclear weapons tests) in granting the benefits stipulated in Article 13 of the Law (additional pay and additional environmental leave); despite the presentation of an environmental certificate and an indication of the norms established in Article 2 of the Law.

Refusal to grant benefits is explained by employers by the fact that according to Article 13 of the Law the right to provide social support (benefits) measures has the population living in the territories specified in Articles 5, 6, 7, 8, 9 of the Law, from which it is concluded that there are no of this right for citizens who have moved from these territories to another place of residence. In this regard, a group of deputies of the Mazhilis of the Parliament in 2016 would make a request to the Government, to which Prime Minister B. Sagintayev gave the unequivocal answer: "For citizens who left the nuclear testing territories, the social support provided for in Art. 13 of the Law, does not apply " [4].

In our opinion, this opinion is erroneous and leads to a massive violation of the rights of citizens who have legal privileges. In addition, here we see a clear violation of the constitutional right of citizens to free movement through the territory of Kazakhstan and free choice of residence (Article 21 of the Constitution of the Republic of Kazakhstan) [5].

Problems with obtaining social benefits are experienced by citizens who lived

in the territories of the former nuclear test site and left the country, in particular, to Russia. The above-mentioned law states that citizens who leave the specified regions and cities for a different place of residence, who fall under the scope of this Law and reside outside the territory of the RK, shall enjoy the benefits provided for by this Law in accordance with international agreements. So, in accordance with Art. 1.2 of the Federal Law "On Social Protection of Citizens exposed to radiation effects due to nuclear tests at the Semipalatinsk Test Site" No. 2-FZ of 10.01.2002 [6], to citizens of the Russian Federation who lived in the settlements on the territory of the Russian Federation in 1949-1963 and beyond, included in lists approved by the Government of the Russian Federation of lists of settlements exposed to radiation due to nuclear tests at the Semipalatinsk test site and received a total (accumulated) effective dose of radiation more than 5 cSv (rem), social services s benefits. While under the Law of the Republic of Kazakhstan "On Social Protection of Citizens Affected by Nuclear Tests at the Semipalatinsk Nuclear Test Site" of 18.12. 1992 citizens who lived, worked or served from 1949 to 1990.

So, according to the Decision of the Constitutional Court of the Russian Federation of 11.07.2006 N 404-O "At the request of the Kaliningrad Regional Duma on the verification of the constitutionality of subparagraph b of paragraph 3 of the Rules for issuing certificates of a uniform sample to citizens exposed to radiation exposure due to nuclear tests at the Semipalatinsk test site" living in 1949 - 1963 in the settlements of the Russian Federation and beyond, included in the lists of settlements affected by radiation in the areas approved by the Government of the Russian Federation the consequence of nuclear tests at the Semipalatinsk test site, as well as the children of the first and second generation of these citizens, who suffer from diseases due to the radiation impact on their parents, were distributed individual benefits and compensations [7]. On the basis of the foregoing, it is necessary to provide legislative explanation of the procedure for granting privileges stipulated in Article 13 of the Law to citizens who have an environmental certificate and who have left the territories subjected to nuclear testing to a new place of residence outside the Republic of Kazakhstan.

Thus, as a result of changes in the current legislation on the social protection of citizens affected by nuclear tests at the Semipalatinsk nuclear test site, measures of social support for the population have significantly decreased. In the legal protection of the rights of this category of citizens of the Republic of Kazakhstan today there are enough problems that require immediate resolution.

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# 跨境电子商务: 将产品信息翻译为法律规定的主题 Cross-border e-commerce: translation of information about a product as a subject for legal regulation

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这篇文章讨论了在个人电子商务领域进行支付的问题。 这个问题在贸易额增长和上合组织国家之间经济互动加强以及各州缺乏调查研究框架的 情况下尤为重要。 本文侧重于聚合者在跨界性电子商务中的作用。

关键词: 立法监管, 信息中介, 贸易汇总, 信息, 互联网, 互联网服务。

Annotation. The article deals with the problem of making payments in the field of electronic commerce between individuals. This issue is especially relevant in the context of the growth of trade turnover and the strengthening of economic interaction between the SCO states, as well as due to the lack of a regulatory framework in the states on the subject of research. The article focuses on the role of aggregators in e-commerce of a transboundary nature.

*Keywords*: legislative regulation, information intermediaries, trade aggregators, information, Internet, Internet services.

In modern conditions of globalization of many economic processes, electronic commerce acquires a transboundary and transnational character. These relations can successfully and effectively develop not only between organizations and public-legal entities, but also between individuals. The complexity of regulating these processes is determined not only by their scale and the complex structure of electronic commerce, but also by the availability of contentious issues in determining the jurisdiction of the applicable law, the specifics of the legal regulation of trading activities. Among the many complex issues of this multifaceted topic, the subject of our research will be the aspect of translating information about goods from one language to another.

More than half of humanity lives in the SCO countries. It is in these states that the key potential for the development of the world economy is concentrated, as the

purchasing power of the inhabitants of the SCO countries currently exceeds other economically developed states and interstate associations. Particular attention is paid to the development of various forms of trade between the participating States of the organization [1]. In addition, it is in the Asian region that e-commerce is rapidly developing and improving, and it is also receiving legal forms of its organization (for example, for information intermediaries) [3].

In trade relations, the key issue for the buyer, as the most active side of the deal with a certain interest, is the product. Formation of interest in the product is due to the presence of a full description (information about the product), i.e. the actual set of information about the goods, which allows to identify the object of the potential transaction and correlate it with the expectations and needs of the buyer. In the case of coincidence of the description of goods with the interests of buyers, a transaction is made. In the context of the direct purchase of a foreign product, the delivery of which will be carried out for the buyer across the border, there may be two actual scenarios for concluding a deal.

First, remote buying can be accomplished through participation in legal relationships of a trading or information aggregator. Secondly, remote purchase can be made directly in a foreign online store, issued in a foreign jurisdiction in accordance with the laws of the relevant foreign state.

Buying on foreign Internet resources, the buyer should clearly understand the legal features of the electronic platform. Foreign websites often act as trade or information aggregators. In this case, there are many questions about the seller's shape. Typically, Internet resources that are aggregators can be identified due to the presence of a set of clearly defined vendor profiles with real communication methods that correspond to one or another set of products. Of course, it is possible to establish the reliability of profiles with a certain degree of convention only by establishing a link through these channels. At the moment, there are no clear international regulatory mechanisms that would allow us to determine the reliability of the seller. In addition, since there are currently no self-regulatory organizations and associations in the field of distance trade in market economies, such mechanisms are not available at the national level.

In this case, one should proceed from the fact that information aggregators act only as intermediaries, whereas in direct trade relations there are quite certain subjects of the transaction - the seller and the buyer of goods who have only found a place in the virtual space for making a deal - an electronic platform. Examples of such internet sites may be eBay, Aliexpress, Deal Extreme, Pandao, Joom, Yandex.Market, Ozon, etc.

The complexity of trading operations with a foreign seller on the Internet aggregator site arises when the parties need to use the transfer. As a rule, the transfer is necessary for the buyer to receive in a language that he understands, if the information about the product is not known to the foreign language. This is where complexity arises, because information and trade agents to attract buyers through cooperation with various organizations seek to ensure proper translation of product information into different languages, including the national language of the buyer. Typically, such a translation may not correspond to the actual or actual description of the product, because it is performed using software. In machine translation, there may be errors and inaccuracies in the description, which actually change both the representation of the product and the set of its characteristics. In this case, when making a remote purchase, the seller receives inaccurate information about the goods, as well as goods, the quality of which actually corresponds to the contract of sale, but does not meet the expectations and needs of the buyer. In fact, Russian legislation does not contain a special legal regulation in this case, which makes it possible to sufficiently clear the arising contradiction. Civil Code in paragraph 3 of Art. 469 quite definitely establishes that "when selling a product on the model and (or) by description, the seller is obliged to transfer to the buyer the goods corresponding to the sample and (or) description" [2]. In fact, there may be a situation where the seller sends the goods that correspond to their description, and the seller receives goods that do not correspond to his translation description.

Given the specifics of the relationship and the presence of an intermediary in them, the intermediary must bear the responsibility for invalid translation in the event that it is used automatically by the aggregator. However, no legal practice has been identified and detected in this issue, as well as the existence of special reservations in public documents on the sites of the most popular trade and information aggregators in the Internet. In such relations, the question remains about the seller's reference to the norm of the legal act in attempts to declare the transaction void, as well as the absence of grounds for such a decision. All this shows that information and trade aggregators need to give a certain legal status in civil law with the aim of creating a modern system of protecting the rights of not only the buyer but also the seller. In addition, practice shows that intermediaries are not always represented "in its pure form", like online stores, and often perform various functions [4].

A more clear situation with the translation of information about the product, the purchase of which is carried out directly on the Internet site of a foreign seller. In the event that the machine or individual (made by the buyer directly due to their own knowledge) the transfer is made by the buyer, then he can get inaccurate information about the product solely through his fault. In the event that automatic translation is carried out in the national language of the buyer on the initiative and the wishes of the seller, then this description should be considered as the basic one, taken as the basis and the original. In this case, the fault for the quality of the goods that do not correspond to the description lies with the seller directly. If specialized

translation is carried out thanks to technical services and software, the seller can (as well as the buyer, on whose order the transfer can be made), make claims to the subject who made the translation.

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# 生态系统研究的方法论基础 Methodological basis of research of ecosystems

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描述了研究生态系统特性的系统分析和工具的先决条件。 系统的分类 被提出。 "人为系统"的概念已被澄清。 介绍了人为系统的目标函数。 在时间和空间上监测人为生态系统的必要性已得到证实。

关键词: 生态系统, 特性, 结构, 人为系统, 建模, 监测

Annotation. The prerequisites for system analysis and tools for studying the properties of ecosystems are described. Classification of systems is proposed. The notion of an "anthropogenic system" has been clarified. The objective function of the anthropogenic system is presented. The necessity of monitoring anthropogenic ecosystems in time and space is substantiated.

**Keywords**: *ecosystem*, *properties*, *structure*, *anthropogenic system*, *modeling*, *monitoring*.

Economic growth, based on industrial growth, leads to an increase in the demand for natural resources, many of which are non-renewable. The pace and existing technologies of consumption of renewable resources can lead to the fact that some of them will be lost forever, and the other part will be impossible to use because of unsatisfactory quality. At the same time, emissions of pollutants into the environment cause a change in the biogeocenoses that have been created and affect the population of those living in these areas.

As a result, consideration of this problem should take place from positions of system analysis. In various branches of material production, scientific research, socio-economic forecasting, it is necessary to constantly operate with numerous objects, which are called complex systems.

The nature of the ecosystem can be attributed to the presence of its structure. A structure is understood as the decomposition (decomposition) of a system into elements or groups of elements, indicating the relationships between them, unchanged during the time of the investigation and giving an accurate picture of the system. This decomposition is formalized by the mathematical concept of the graph. It should immediately specify the relativity of these concepts. Thus, the element of this system, because of the hierarchical structure of the world, is itself a system with its elements. Fixing the system divides the world into two parts - the system and the environment. At the same time, they emphasize the great strength of the links of the elements within the system, rather than with the elements of the environment.

Distinguish the structure, with elements that are equally included in it, and a hierarchical structure.

In this case, a hierarchy is a structure with the presence of subordination of some elements to another, when the actions in one direction exert a much greater influence on the element than in the other.

It is necessary to distinguish the informal structure of the system, for which "primary" elements (up to atoms) appear as elements, and formal. In the latter, systems of directly downstream hierarchical level appear as indivisible elements.

Change in the structure of the ecosystem in time can be regarded as its evolution, development. Development is understood as a directed, regular change in the ecosystem; as a result of development, a new qualitative state of the object - its composition or structure. There are two forms of development: evolutionary and revolutionary. The revolutionary form of development is characterized by a rapid change in the stable states of the ecosystem - a catastrophe (a sudden change in the form of a sudden reaction to a smooth change in external parameters) [3]. In addition to development, we can distinguish the concept of growth. Growth is an increase in size through absorption, growth of material [2].

The purpose of the functioning of the ecosystem is the task of obtaining the desired state of the system.

Note that the definition of the goal implies:

- the need to set local goals for its elements;

- targeted intervention in the process of ecosystem functioning, called management.

The main tool for researching systems is modeling. The main types of simulation are shown in Fig. 1.

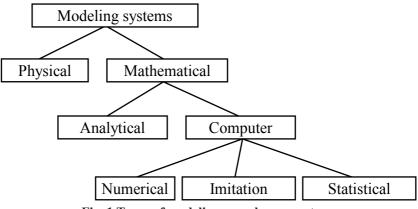


Fig. 1 Types of modeling complex ecosystems

Physical modeling assumes that the system itself is used as a model, or another system with the same or similar physical nature. An example of physical modeling is micro-, macro- and mesocosms that are part of the ecosystem and spatially separated from the environment for the purpose of conducting experimental work.

Mathematical modeling is understood as the process of establishing a certain mathematical model for a given real system and exploring this model to obtain characteristics of a real system.

For computer modeling it is characteristic that the mathematical model of the system is created in the form of a computer program - a computer model that allows carrying out computational experiments with it. Depending on the mathematical apparatus used in the construction, and the way in which the computer experiments are organized, three interrelated types of modeling can be distinguished: numerical, statistical, and simulation. Simulation modeling is a kind of computer modeling, for which the reproduction on the computer (imitation) of the process of functioning of the complex system under investigation is characteristic. In this case, the elementary phenomena that make up the process are simulated, with the preservation of their logical structure, the sequence of flowing in time, which allows obtaining information about the state of the system at given instants of time. Statistical modeling is a kind of computer simulation that allows you to obtain statistical data about processes in a simulated system. Simulation allows:

- Combine the merits of traditional theoretical and experimental methods, that is, a mathematical model and an experiment on a computer.

- To guarantee the high efficiency of the application of computer technology and the means of computer science and automation based on it.

- Investigate such systems, physical modeling of which is economically un-

justified or difficult to implement (for example, expensive equipment is required, etc.);

- Investigate systems whose natural and physical modeling is associated with conditions that are dangerous to humans (for example, in conditions of high radiation or toxicity);

- Investigate prospective systems (not existing yet in reality) at the stage of their design.

- To explore economic, social, ecological and biological systems.

The indicated merits make mathematical modeling:

- Universal intensive methodology and technology;

- The intellectual core of computerization;

- The main tool of applied mathematics and computer science in the study of real ecosystems, processes and natural phenomena.

All of the above applies to anthropogenic systems. Let's try to identify some elements of this system, taking into account the hierarchy of systems.

We offer the following units of systems:

1. Natural systems;

2. Technogenic systems;

3. Anthropogenic systems;

4. Social life.

Schematically, their relationship can be displayed as follows:

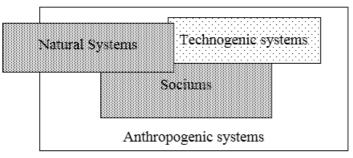


Fig. 2 Relationships between systems

This scheme reflects both the interaction and the degree of inclusion of one system in another.

Such a subdivision is based on the difference in the basic regularities of interaction between the elements of these systems.

Let's consider features of modeling of separate systems.

To natural systems, we refer naturally formed biogeocoenoses that are not af-

fected by human activities. There are models of isolated populations, competitive relationships in communities of organisms of one trophic level, with interactions such as "predator-prey", populations with age structure, distributed ecological systems, "resource-consumer" systems with delay, etc. We can say that natural systems describe the state and behavior of the aggregate of natural resources as renewable (water resources, animal and plant world), and non-renewable (mineral resources).

To technogenic systems, we refer systems formed by man and designed to meet the needs of human society. This category includes all the economic activities of a person, both in the sphere of industrial production and in the sphere of services.

The modeling of these systems is most developed due to the artificiality of their creation. Indeed, when planning a particular economic activity, scientific research is first and foremost made possible to derive certain regularities in the existence of these systems and enable them to effectively manage them in order to achieve, as a rule, maximum economic efficiency. That is, the objective function of these systems is maximum economic efficiency. Mathematical models of such systems are developed in a number of sciences.

To social systems, or sociums, we refer systems of human communities with their inherent social organization. The objective function of these systems is to achieve the highest possible standard of living. And the standard of living is made up of a set of requirements: life expectancy, material prosperity, position in society. The mathematical apparatus of these systems is well worked out in demography, sociology, and political science [1].

The above systems can be attributed to one level of the hierarchy. That is, they do not have preferable directions of influence of one system on another. Each of these systems is equal and can interact with any other system.

Under anthropogenic systems, we will understand a system combining the above-mentioned systems. The goal function of this system will be the achievement by individual elements of its stable state when a certain optimum of their state is reached. Mathematical modeling in this system refers to the description of the interactions of individual systems among themselves. So, to these models it is possible to carry models of distribution of polluting substances in the environment, combined (synergistic) action of anthropogenic factors on the dynamics of ecosystems, etc.

Thus, the further development of ecology as a science should be connected with the consideration of the existence of anthropogenic systems in time and space on the basis of their mathematical modeling in order to achieve the most beneficial and sustainable state of these systems. Complex monitoring of natural, man-made and social systems should be carried out to build new or correct existing models, improve their interaction, and determine the parameters of these models. *The results of the research were obtained within the framework of the state task (Task No. 11.9503.2017 / 8.9).* 

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#### 中国古代哲学主体与能量学的经验

## The experience of subject and energy studies ancient Chinese philosophy

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中国古代哲学学院是部署单一学科 - 一个充满活力的基础的问题。 基金会命名的每个部署阶段都是中国古代哲学学派之一的构成矩阵。

关键词: 客观性, 动力, 宇宙, 积极潜力, 主体自我实现。

Annotation. School of ancient Chinese philosophy are the issues of deploying a single subject-an energetic base. Each of the named deployment phase of Foundation is the constitutive matrix of one of the schools of ancient Chinese philosophy.

*Keywords*: objectivity, energinet, the universe, positive potential, subject self-realization.

Theoretical studies on Chinese philosophy are diverse and have a rich history. Without giving a detailed comparative analysis, we will pay attention to the ontological aspects of the essence of Chinese schools. We assume that all Chinese schools can be regarded as a single unified subject-energetic basis of being. The conceptual scheme of the study serves as a method of subject-energy analysis [3].

Philosophical teaching is always the concentration of the relationship between the mental form (soul) and pure energy (spirit). Dialectics of the development of these relations in the aspect of origin, development, interconnection and mutual transition. The development of the objectivity and energy of being is considered through the reciprocal interdependence of the energy of thought forms and their objective certainty. Not all Chinese schools can track the completeness of principled positions in their sequence, however, we assume that we will find confirmation of the advanced thesis about inversely proportional objectivity and energy.

Chinese philosophers, the founders of diverse schools, proposed various concepts for the construction of reality, but were united in considering the structure and development of the world. The central place in our approach to Taoism belongs to the basic category of all Chinese philosophy - the Tao as the essence of the total being of the universe in its metaphysical understanding, realizing that it is possible and materialistic perusal.

The wise old man Lao-tzu gave a philosophical interpretation of his energetic ascent. In Taoism, "Tao without name" is used, which has the name "nothing" and Tao, which has a name that has a material basis. Tao as possessing and not having a name in their unity is an Invariant. Tao, which has a name, as a constitutive mental form is equivalent to the material world. Let's consider schematically the development of the objective definiteness of the Tao, which has a name.

The first thought form - "Tao, which can be expressed in words, is not a constant Tao. A name that can be named is not a permanent name. The nameless is the beginning of heaven and earth. <...> The nameless and possessing a name (italics of authors) - of the same origin, but with different names. <...> The transition from one of the deepest to the next is the door to all that is wonderful (ch. 1) »[1, p. 182]. Developing the logic of our reasoning: "dao - I", i. "Tao is Lao Tzu (I)", we formulate the first constitutive mental form, where the "I" is objectively definite and identical to the world. In this mental form there is - the ultimate universalization of being. Lao Tzu notes that "Tao is the deepest gates of birth. <...> It is both the smallest and the infinite, and its action is inexhaustible. <...> If I try to express it, I will designate it with the hieroglyph Tao; if you try to give her a name, then I'll call her Great ... Great - it's in an endless movement. Being in an infinite motion does not reach the limit. It is infinite, and returns to its source "[1, p. 183]

Consider the "transformation" of an ethical hero in Taoism from *sheng* (perfect) *to jun zi* ("noble husband" in Confucianism). "Turning into the opposite is the *Tao* movement. <...> The perfect man proceeds not only from what he himself sees, so he can see clearly ... "[1, p. 185]. Perfect (the person with the higher *de*) is identical with the Tao, which does not have a name, is associated with the ultimate energy. "The person with the higher *de* does not strive to do good deeds, therefore he is virtuous; <...> the person with the higher *de* is inactive and fulfills non-action; <...> a person of the highest *jen* acts, carrying out non-action; a man of the highest justice is active and his actions are deliberate; a man of the highest *li* acting, hoping for reciprocity "[1, p. 190]. The perfect man is able to maintain conjugation with the ultimate potency of virtue; with the energy of Tao, without a name; with energy of philanthropy, justice and law

*Tszyun Tzu* ("noble husband") - "a man "with the lowest de" does not leave [intentions] to do good deeds, therefore he is not virtuous; <...> a person "with the lowest de" is active and his actions are deliberative ... "[1, p. 190]. *Tszyun Tzu* on the way of ascent to knowledge and awareness of the event of the spirit is detached from the *de*, material realization, objective concretization of the *Tao*. In

Confucianism, the "noble husband" is the bearer of knowledge of the *Tao* in the finite (material) form, i.e. "A person with a lower *de*" identifies himself with real being. "That's why *de* appears only after the loss of the *Tao*, *jen* - after the loss of *de*, justice - after the loss of *jen*, *li* - after the loss of justice" [1, p. 190], which objectively belittles the follower of Confucianism in comparison with the energetic ecstasy of Taoism. *Tszyun Tzu* ("noble husband") is identical to the values of real being, whose integrity and harmony he is concerned about. *Sheng* (perfect) is identical to *Tao*, who has no name, he experiences an energetic shock in which all the early objective determinateness

Philosophical teachings (schools) within the framework of Chinese culture can be built along a single contour of experiencing the axial event of the spirit of the world-creating subject of culture. "If Confucianism expresses *the first phase of the emergence of the event of the spirit* (the universalization of the subject poles of the mental forms of the soul), and Taoism is *the second phase* (the destruction of the soul, the real and nominal Nothingness, the Invariant), then Moism fully corresponds to *the third phase* (the constitution of a new soul on the matrix of the positive side of the Invariant , which is the subject pole of a new mental form, on the matrix of Lika) "[4, p. 74]

Mo-tzu of the perfect-minded said that they in turn "established the degrees of virtue and worshiped wisdom" [1, p. 198], i.e. it was the return of the soul to newly acquired certainty on new grounds. Having experienced an energetic ecstasy, perfect in the interpretation of Mo-tzu had to "honor *unity*", such a matrix in the mosaic was "universal love". At the base of chaos, the absence of order lay different ideas about justice, therefore "the more people were born, the more different ideas about justice became" [1, p. 199]. In the discarding of the personal identity (the first thought form), the realization of the energy flash and its retention at the point of "nothingness," "... the son of heaven could create a single model of justice in the Celestial Empire ..." [1, p. 199], i.e. moist became identical to "nominal nothing".

Mo-tzu puts forward three rules of elevation to "nominal nothingness." "There must be a foundation, there must be a source, there must be applicability. What is the foundation? The supreme foundation is the work of the ancient perfect vans. What is the source? The original source is actual things, deeds, judgments ... <...> What is applicability? Statements should be applicable ... "[1, p. 205]. Before the moist is the task of *personal interpretation of the will of the sky*: "... who in the Middle Kingdom are working, can not help but have a sample, there is no way that the case could be done without a sample ... There is nothing better than to take the sky for the model" [1, p. 201]. Mo-tzu, experiencing the stage of "noble non-action" and spiritual crisis, creates a new social thought-form that is correlated with "nothing".

The phase of positive self-realization can be considered on the example of the

school of legism. In the legality of "*Tao* is the fusion of laws that make all things what it is, it is the support of countless certain laws. Tao forms the common basis for the emergence of all things and the acquisition of a form for them "[1, p. 236]. Han Fei-tzu believed that *Tao* is the law for all things, and the diversity of laws of being is not mutually exclusive. And the laws of the sky and human laws coexist peacefully. "Tao exists in all things, following the naturalness ...", therefore, what harmonizes the *Tao* of heaven and man is naturalness, adherence to one's destiny, being. Characteristic of the Tao is indivisibility and uniqueness (uniqueness), signs - emptiness and immobility, peace and solitude

Legists believed that the nature of man is evil. What are the causes of evil in this world? The Tao of the sky (ultimate abstraction) establishes universal love and absolute good. "The sky does not act, it improves, does not demand, it reaches everything; this is a property of nature "[1, p. 236]. And only the *Tao* of real life follows the natural nature of man. In the process of spiritual renewal, the ultimate abstraction of "nothing" legists concretize in the person's personal deeds. More specifically about this writes in his work Xun-tzu: "Congenital properties - this is the fruit of the action of the sky ... <...> Man has an evil nature" [1, p. 230]. Evil on earth from a person, so followers of legism try to agree on a common understanding of concepts: damage, suffering, guilt, forgiveness and compensation.

Xun-tzu notes "what a person has from birth is called nature. The nature of man is formed from the action of the forces of *yin* and *yang* from each other; the connection between spirit and thing leads to the appearance of certain qualities of a person. These qualities, inherent in man from birth, are called the nature of man. A person inherently has feelings of love and hatred, joy and anger, sadness and merriment "[1, p. 228]. Then the redeemed wine, the redressed damage and forgiven suffering is good. An angry or not forgiving soul is a personal identity to the universe of being, a rejection of the real device of being, considering it unfairly arranged. Loving himself, he is irreconcilable to the world and demanding of his fellow citizens.

Han Fei-tzu, who shared Xun-tzu's view of the evil nature of man, believed that the evil nature of man can be thwarted by punishment and fear of punishment. Legist Shang Yang, glorifying the tightening of punishment, believed that jen - the basis of the crime. The universal desire to develop a totally evil attitude to the world explains the rise to the principle of this attitude to the world. *Tao* for Han Fei-tzu is a legal law, but also a certain designation of the event of the inner life of a person having the highest meaning of the universally constitutive principle. Han Fei-tzu realized the constitutive role of Primacy. Han Fei-tzu does not want anyone to give a pedestal, except the emperor: *Tao* he - personally! He can allow his personality to be transferred only to another and unique personality - the personality of the emperor. He almost refuses to give, whatever it is, his own property.

The subject-energy study of the main provisions of traditional Chinese schools in the channel of identification of personal identity seems very promising for modern Sinology.

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# 在全球化背景下衡量现代俄罗斯的国家安全 Measuring the national security of modern Russia in the context of globalization

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作者分析了现代青年在现代社会全球化背景下的地位和作用的关键问题。研究的主要对象是世界观战争,作为控制个人和社会整体意识和行为的主要因素。世界展望战争的全球因素是全球因素分解,作为西方资本和商业样本在资本主义世界的影响工具,以及它们地球发展到不断增加的利润的方式。本文考察了资本形式和与之相关的人类本质的转变现象,它是现代社会全球化浪潮的主要来源。与这些进程相关的科学家关注的核心是俄罗斯在全球化背景下的国家安全问题。

关键词:全球化,社会,现代青年,国家安全,世界观,国际社会,发展前景

Annotation. The authors analyze key issues of the place and role of modern youth, its outlook in modern society in the context of globalization. The main object of research is world outlook war, as the main factor in controlling the consciousness and behavior of the individual and society as a whole. The global factor of the world outlook war is global factorization, as an instrument of influence in the capitalist world of the samples of Western capital and business, the ways of their planetary development to the ever-increasing profits. The article examines the phenomenon of the transformation of the form of capital and the human essence associated with it, as the main sources of global zapadification in modern society. At the core of the attention of scientists related to these processes are the issues of Russia's national security in the context of globalization.

*Keywords:* globalization, society, modern youth, national security, worldview, world community, development prospects.

The future of any country is focused in the struggle for youth, its intellect, worldview, values and priorities. This issue is global, it is an extension and the future. The price of this issue is really high: it's health (including psychophysical

and moral-volitional component), and demographic indicators, and spiritual and intellectual potential, and economic and social indicators, etc. At the beginning of the twentieth century, the Spanish philosopher Jose Ortega y Gasset warned mankind about the negative phenomenon of the "revolt of the masses", which, in his opinion, is based on the paths between the generational dynamics. Scientists tend to argue that young people are the future of any state and humanity. The philosophical fact is indisputable and can be traced both in the biological and in the social history of man. At the same time, there is an understanding of the whole conventionality of the real future, but the mind and will of man force him to rise again and again in battle for a better future, leaving behind the history of his being in the universe, or simply on Earth.

The program for the realization of human hope always lives in us and calls for battle in a better future, but here it is important that the future be really better than what is available, bright or lighter, etc. Here is the starting point of reference: which way to go next? Here we realize that the future lies in the hands of those who are moving on, and the mission of all generations to have time to pass on the accumulated experience (positive and negative) for generations to help a person go further along the distant and unknown path of wanderings. Here it is manifested - the "battle" for the youth, as a "battle" for the future of society and the whole human race. Let's consider some social and philosophical aspects of this problem on the example of the destiny of our country in the modern globalized world.

We understand globalization as a complex natural-historically developed rational design of the modern man's being under the influence of a mass constantly increasing complexity of production, and the same massive and increasingly complex consumption. The dialectic and complementarity of these pairs is unquestionable, a person always appears between the poles or acts as an object from their exploitation of himself (ie, objectified), despite the fact that he himself generates them. In fact, globalization is the process of integrating the resources of individual countries and peoples on the basis of a system of rationally organized world production and consumption, in the shadow of which there is a hidden trigger mechanism - capital, business, and its large politics and culture. The modern project of globalization is a project of economic expediency, expressed by the law of greater profit, driving people who profess the principles of capitalism and business. This is what K. Marx called his work, characterizing the modern society of capitalism, turned into a form of capital, that is, subordinated and controlled, by capital reality. The subordinate is so much that both politics and culture serve capital, being accidents and functions of its development.

Going beyond the limits of Western capitalism into the space of the world community is the modern form of globalization, economic, Western globalization. In this sense, the escape of Western capitalism beyond its borders is an act of reaching out to the great natural and human resources that can be involved in the active mechanism of society, and an outlet to the broad markets of mass production, that is, an outlet to the universal society of mass consumption. At the same time, the development of non-economic spheres of man-education, science, culture, and art-is proceeding. In the modern mind, the institution has been entrenched in the belief that the mass culture and ideology of liberal democracy, which support and advertise various information technologies, the Mass Media, the INTERNET and advertising, protects and prolongs the power of capital over the consciousness and behavior of a person. P. Sorokin, a Russian-American sociologist of the XX century, uniquely identified the essence of capitalism, referring him to the sensual form of culture [5, p. 260-264]. So the additional mass production system was formed the beginning of the society of mass consumption (consumption as happiness).

A whole series of these questions was explored by V.P. Shalaev. in a number of his works [6-11]. Capital and capitalism, in its form, synthesized by globally grown Western capital, business, politics and mass culture, became the dominant of the modern public and private life of a wide range of peoples of the world community. Here there are a lot of different threats for man and mankind. The influence of globalization in its western, standardized form on the cultures and civilizations of the peoples of the world, is ambiguous. Under the influence of the unifying influence of Western civilization and Western culture of the masses, the world community is becoming less stable and more unpredictable in its further development. Unification and objectification of civilizations and cultures as a resource of global capitalism, gradually increases the degree of risks to human life, manifested by numerous and often chaotic protest movements around the world.

One of the protest movements, in the most dangerous form of manifestation, is the movement of Islamic fundamentalism and IGIL, which have the pathos of combating utilitarianism and primitivism of Western values in the consumer society. Growing protest fluctuations, reflecting the ideology of disagreement and rejection of the unifying rink of economic globalization [3, p. 128], managed exclusively in the interests of this center, are becoming less and less controlled every year. Using the terminology of the philosophical-synergetic approach, we note that the world community of countries becomes more unstable and bifurcational, its state is increasingly subject every year to the laws of randomness, that is, to bifurcation mechanisms (according to the Russian thinker and mathematician N.N. Moiseev), than mechanisms of determination [4, p. 52-66].

Such a state can lead the world system to new challenges bordering on irreversible social chaos, when the available traditional deterrent moral and rational activity potential of countries and peoples of the world will be insufficient

or ineffective for an orderly solution of emerging global problems.

The processes taking place in the system of upbringing of the younger generations, the state of the worldview of modern societies, play a fundamental role. The form and content of these processes are an important factor and regulator of man's production of a certain type. Modern schools and universities are accessible today for the broad masses, the role in the training of the standard average person, as the standard qualified personnel of civilization, culture, politics, industry, business, social development, etc., is becoming a kind of factory for the production of a certain globalized personality type. The parameters of these standards are represented by the Western form of consumer globalization, realized in the modern world. Organized processes of standard education and upbringing (schools and universities) have become factories of the formation of a liberal-democratic, consumer-type personality. The central role here is assigned to schools and universities to produce future leaders of organizers, thinkers and technologists of the global world of production and consumption. This function in the past was limited to a certain social standard, laid down in education by the dominant civilization and culture. In modern realities, the emerging modern dominant globalized (western) standards of the personality of leaders are more technologically advanced, may even be more organized, but much less patriotic. Perceiving Western patterns of thinking and technology, these leaders are not national. This standard, enriched by his education and upbringing type of man ordered rationally and thoughtfully. Such a person is produced under the control of large capital and as a commodity.

Scientists examine the issues of the essence, role, consequences of globalization, as a Western project of the socialization of the world [6-11]. Fundamental conclusion, in our opinion, is that the fragility of the civilizational and cultural world on the planet is substantially increasing in modern conditions. Against the background of the crumbling variety of civilizations and cultures of the world community, the growth of their interdependence, economic, political, ideological uncertainty, instability and unpredictability of the ways of further development of countries and peoples in the emerging global system are growing. In this situation of fragility, any crisis related to deformations of the basic supporting potentials of society can play a decisive role in their future destiny. We are convinced that the world outlook factor becomes decisive in this case, and the education and upbringing based on it, which underlies the socialization of the individual as a citizen of the country, become the most important factor in preserving and developing the cultural and civilizational identity of countries and peoples in the modern world. The decisive issue is the ideological orientation of the formed worldview, the core of which is not only moral universal human values, but also the values of cultural, historical and civilizational identity, including patriotism,

social justice, responsibility, altruism, loyalty, duty, service to the fatherland and t. This is the core of national and cultural identity, since they are manifested in every segment of the system of personal or public life of peoples and individuals, and their youth is always the main object of education [8, p. 272-278].

The central role in the issue of the security of peoples, both cultural and civilizational, and ethno-national belongs to the institutions of upbringing and education of the younger generations. In the atmosphere of Westernized economic globalization and the consumer society, children and young people are increasingly victims of the victory of technology and pragmatism over humanitarianism, spirituality and national patriotism [12-15]. Children and young people are copying the ideological atmosphere of a global society, becoming a springboard for the future of peoples, hence the modern institute of education and upbringing, including university education and upbringing, faces serious internal and external challenges. All this is essentially connected with national security issues. English sociologist and culturologist Arnold Toynbee in "Comprehension of history" made a fundamental conclusion about the interrelation of ideas and stereotypes of young generations and the dynamics of social development [6; eleven].

In the national upbringing and education, a meaningful program should be laid down which is to be a society developing or conserved, independent and free or dependent and administered from the outside [9; 10]. The most significant aspects of the question under consideration are presented in the form of generalized theses.

1. The situation of globalization can be regarded as the spread of a society of mass production and consumption on the basis of the Western system of values, goals and patterns of organization of public life of peoples, first of all, the liberal-consumer value system. At the same time, this form, becoming an independent force, undermines all social institutions, without which the social life of people is impossible: moral values, law, religion, family, etc., as well as all spheres of material and spiritual ( including professional) activities of people, which it fills and replaces with its own samples.

2. Global Westernization manifests itself, first of all, in spreading the liberalconsumer world outlook and the consumer value system born in the West as an element of global production-consumption. The cultural envelopes of liberal-postmodernist Westernization today are education, the Mass Media, the INTERNET, cinematography, entertainment industry, etc., acting as technologies for altering a person's consciousness on the global principles of behavior.

3. The global, western-privatized mass production needs an intellectual workforce accelerated in 2-3 years, which is solidary with the values of a society of mass production and consumption, culturally omnivorous, capable of a high level of mobility, in accordance with the dynamics of international division, capital, labor and production.

4. The formation of a person loyal to Western consumer values is also influenced by the one-sided mass cultural, liberal-consumer worldview, inculcated by external global liberal-consumer information traffic (liberal media and Massmedia, INTERNET, mass culture cinematography, entertainment industry, etc.), substantially distanced from the cultural and national soil of their countries and peoples.

5. Young people become victims of de-ideologized, liberal-consumer information and cultural traffic, which brings it to history, values, goals and stereotypes of behavior alien and artificial in relation to the civilizational and cultural soil of its own country. Our youth over the past two decades has become not only apolitical, but also largely cosmopolitan and western-privatized.

6. Nationally oriented ideology should be returned to the national education at all its levels as an important factor of national security and the historical viability of Russia in a global competitive society.

7. Considering the forms and content of the educational process acting in the wake of Western educational standards imposed on Russia, the personality that is being prepared in universities should not only be de-ideologized, but be brought up in a liberal way. The teacher, as the bearer of knowledge and culture, is not the center of the educational process, but the student, provoked by the liberal educational system, becomes the center of education, which generates conflicts and educational and upheaval crises far from the tasks of nationally patriotic oriented socialization of the younger generations [9, p. 132-144]. These social diseases came to us from the west, which, according to the definition of the modern Western sociologist and thinker E. Giddens, today one can speak about the phenomenon of "evaporation of morality" in the west [1, p. 18].

The most important factor in familiarizing and subordinating young people to Western standards and patterns of consumer thinking is a well-established mythological machine. Mythological creativity is akin to a sensually emotional reality, close in content and susceptibility to man [16, p. 165-175]. A case in point is the example of the modern Baltic region of the former Soviet Union, which absorbed the propaganda elements of the Westernized mythmaking. After the collapse of the USSR, from 1991 to 2014, the Baltic countries lost about 20% of their population, now rapidly aging [18]. This loss is associated with labor migration and an individual-consumer-oriented way of life, for which the institution of childhood is a burden.

Borrowing young energy is one of the main goals of programs to support educated migration to the developed countries of the west. The American nongovernmental Institute of International Education "Open Doors - 2014" reports that the total number of foreign students studying at universities and colleges in the United States has increased by 8% in recent years compared to previous years and amounts to almost 900 thousand people. The fastest in the US is the growing number of students and graduate students from China, India, Kuwait, Brazil, Saudi Arabia and other non-Western countries of the world [17, p. 331-342]. The phenomenon of intellectual and educational traffic testifies to the scale of the leakage of young "gray matter" in the US and to the west. A similar situation exists in Western Europe, which has opened its programs of international educational mobility and education to all countries of the world. Russians travel to Europe much more than in the US.

Important preserved basics of production of their own creative and patriotically minded personnel, as the basis for innovation and development of society. The experience of Eurasianism is most fully represented in the understanding of L.N. Gumilev [2, p. 124-128].

Today, a program of nationally oriented, patriotically focused values is needed in the global world in order to go its own national way, and not be a resource of an external development project. The quantity and quality of available experience and resources are available in Russia. It is only necessary to ponder, it is necessary to understand and it is necessary to work patiently over its comprehension and conversion into the program of national action.

The process of a cultural and civilizational turn has already begun and examples of this are enough. He is moving towards polarity, as a maximum capable of many poles in the space of the whole man and the diversity of civilizations and cultures, awakening and protesting from the consumer Western dream of capitalism. This process is captured and the West, subject to the realities of consumption, which brought him a lot of painful losses. In the modern West, the theme of healthy traditional values is sharper in the issue of preserving peoples in a new, emerging world striving for equilibrium, through the denial of the extremes comprehended in history. Therefore, in our opinion, it is precisely in the west that opposition should begin with the greatest strength, most likely the one that once lifted the West to the height of the cultural and civilizational status in a single pyramid of the peoples of the world.

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#### 整合与协同 Integration and Synergy

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Many scientists and thinkers of the past and the present have tried to seek an answer about the fact that such a universe and where exactly the place of a person in it. Each of them positioned himself on the point of view that developed in him by this time. We will not enumerate all of them, for this is a great number of opinions (for Ancient Greece alone gave thousands of them to the world, not to mention ancient India, where there are innumerable numbers of them), but we will only talk about one point of view, which will be the most general, but because it is the most correct one.

This point of contemplation is not based on any abstract event or phenomenon or fallen state of mind, but on the joy of eternal peaceful coexistence of the whole society, staying in constant creativity and building up each member of the collective, on life-affirming principles of integration and synergy. It is clear that all judgments are best done on the basis of centuries of experience and a naturally formed image of the world view, because in those difficult conditions of life, in which mankind always existed, this moment was the most relevant, thanks to which humanity survived, without having any medicine and safety engineering labor.

For this reason, any scientific judgment, as in those distant times, can only be positioned on one common goal-the multiple victory of life over death. Something different, I will always repeat it is alien to the very nature of the living, and therefore it is not acceptable for the universe and man in it. Since the victory over death is manifested in all its formats and images on Calvary of Christ, it is Her that we take as the basis of the foundations. This is the same General within which everything fits around and is conformable to this Event of all events. That is, the coming of the Son of God on Earth is a key moment for all the destinies of the world, and therefore all that was before His earthly existence is a prophesy about His First Coming. All that was and will be after His Resurrection is already a testimony of Him and His Calvary, and at the same time a prophecy of His Second Coming to make His Judgment.

This interpretation fits into all the concepts of life, and therefore we take it as

a basis. After all, if we look closely at the Cartesian coordinate system, we see a non-correspondence, in which zero generates a set. And after all, zero can only give birth to its own likeness - the self-sufficiency is also zero. Consequently, only the statement that the coordinate space is an expanded expression of the properties of a zero or the disclosure of its qualities will be scientific, as Aleksei Fedorovich Losev said in his works. Science, in this case, acquires a different and at the same time remains consistent with the First Coming of the Son of God, dividing the same space in this prototype into what is before and after it. And so the whole world. To answer the remaining questions of our time, we can only reveal the type of the First Coming of the Son of God in everything else or in all other spheres of human understanding.

So, before us is the Event of events, which in each sphere of the world perception has its own unique unique name. Let's name these names. It is clear that they will be conformable to zero or some emptiness. In other words, if we say that life is truth, then we will tie all formulations to the physiology of man and not just to physiology, but to the joy of the soul, which is the basis of the living organism. After all, it's no secret that a person can live with a physical illness all his life, and with spiritual pain he will not live even for an hour. With joy in the soul, a man does not notice the difficulties of being, and with a trauma of his soul he can not find a place even in Paradise. And here it is necessary to understand the human psyche especially deeply.

The fact is that people's happiness is multifaceted, but if in Paradise (in the scientific language of concepts this bears the name of ecstasy) people were communicants to all facets at the same time, now to the fullness of the joy of being man is given only to conform only in the continuity of consistency. That is, a person can live only in one case, if he is constantly happy, focusing attention on one and the other facet of the joy of being. And that is not all. The fact is that a person can be a communicant to some kind of face for only a certain time and some proportions, for above this joy first goes away, and then over and above the measure already passes into unbearable pain. It is for this reason, it is necessary to constantly switch from one side of happiness to another within acceptable limits.

This is the physiology of a person who is born with the happiness of God and for happiness in Him, and therefore can not long remain in one position, that is, he must stimulate his nature in some sequence of priorities. If we pay attention to Orthodox practice, then we will see the system. For example, the bell tolls around the whole district, so that people who are on arable land work, do not stagnate on one thing, but they focus their attention on a certain act of the Liturgy. Services were performed every day in the same cycle so that a person could live in joy that would be organized, and therefore each person became part of one cohesive team. It is well said about this in the Gospel, where the Son of God says that the disciples should follow a man who carries a jug of water. Under the jug with water is meant this joy, which should be carried through the danger to it. A person chooses his own way so as not to spill the contents of the jug, that is, he is already at the moment filled with joy and having reached the goal he remains with her. This is the main idea of Easter, which in translation means "pass by".

If we look at the history of mankind, then we will have the sense of being scientific and technological progress - this is the very origin of speech, and writing, and in a wooden hut, the fire in the furnace, and the organization of the liturgical cycle. All these are adaptations for unity with God and so as to constantly be an adherent of all facets of happiness in a cyclic sequence. Nowadays, the same condition of being in joy is claimed to the same degree that humanity originated from the very beginning - this is the same nature of the living, which can not be more perfect, but only the more perfect instruments through which this joy triumphs. Therefore, the joy pretends to adapt again, but only in new concepts and knowledge about nature, about the person himself, and new conditions of labor stimulation of the nature of human joy on the basis of advances in science and technology. What are we talking about here?

## Archeology.

According to archaeological findings, scientists argue that in the Neolithic age, people from a permanent nomadic family moved to a settled way of life to a collective economy. What exactly contributed to this? As I have already said, the natural state of a person is being in constant ecstasy. That is the most terrible evil is only one - the loss of this quality of life. Proceeding from this definition of a man, we are faced with a picture - a man was looking for something that would contribute to this affirmation of the existence of people. Since the linguistic conceptual set of tools has not been worked out until now, I will have to resort to traditional concepts of religion. Although, what to say, the modern definition of man is erroneous, for man is an integral part of the Sun. It is a sunny bunny, which in the process of evolution adopted the usual modern image. If there is no light source, then there is not this light spot, that is, if there is no connection with God, then there is no happiness, no life. Here is the angle in which to determine the nature of people. A person is a connection with God, which carries in itself an incidental one - the happiness inherent in the Kingdom of Heaven. A nomadic way of life is a hunt, during which a person has to do unnatural joy - killing the person in whom they saw themselves - a living organism. In some drawings of rock art, we see painted mammoths, in the head of which sits a little man. People saw in the behavior of the animals themselves and realized that during the hunt they were doing evil.

By itself, man also tolerates evolutionary development, because peacefulness is a condition for peaceful coexistence of every person in the collective and the whole collective as a whole is a truth that is not even discussed. Therefore, inevitably, there should be an increase in the peacefulness of the ancients, which later manifested itself precisely in this - the person was happy if the neighbor in the collective was happy. This was the reason for the transition from a nomadic way of life to a settled one. Yes, the relics of the deceased relatives had a beneficial peace-keeping influence in all aspects, but this influence can be recognized only by an already prepared, already formed person. So, before us is the affirmation of the connection with God in the modern contem- porary image we are contemplating, than we are ourselves.

If we start to consider the nature of the human body itself, we will see the same thing. The human body is such a mechanism that is called upon to contribute only to the same quality of being - it is called to maintain the brain's ability to work, to keep the mind in the clarity of the world view. The most high-quality blood, the most oxygenated and nutritious blood on a separate artery coming from the heart enters the brain. This was noticed by the ancient thinkers of India, which was expressed later in their creeds of Vedanta. Our organism is called to contribute to the affirmation of this connection of man-God. In the same vein, the entire universe evolved. Everything went only within these boundaries, and what happened outside of that has irretrievably disappeared and therefore we do not know anything about it. But for us it is important to notice the important discovery that the ancients made, thanks to which the God-man relationship became more stable. That is, thanks to her man less distracted from God. His work became cyclical, monotonous in the prototype of the monotonous cyclic processes of the organism itself. We do not control the heartbeat, we do not notice our breathing and digestion processes - all this is maintaining the clarity of the mind, that is, not distracting from the ecstasy of the God-message part of physiology. In the same way, part of the physiology during the transition to settled life is the labor exploits of the collective economy of people of that era.

Let us briefly review the experience of the Vedic tradition of Ancient India, which, according to the discoveries, was a religious trend of the indigenous populations of Eastern Europe. The main thing in it is the stay of a practitioner in the state of nirvana, in some withdrawal from himself, some liberation from his own nature. But this is possible only in India, where the conditions of life are free. That is, in the conditions of the North, where "one day a year is fed", intensive labor activity is needed. In other words, there is a need to combine one with another. That is, to combine the goal of survival in the winter time with the life-giving happiness of nirvana at the moment of summer work on earth. This is the very quality of God-man communication, to which the ancients passed by adopting a sedentary lifestyle. He reached the very moment when the Slavs made the Great Resettlement from Eastern Europe to the coast of the Indian Ocean. Just under special conditions, when the intensive work of the northerners was not in demand, asceticism took a different form - nirvana. The only thing, it should be added, was that it was not the message of God, which we accept as dialogue with the Person of the Creator. It is simply a cleansing-liberation of ourselves to God's conformity, that there is also a sacrifice to Him that He receives and a person receives some fruits of satisfaction, although far from the comprehensive completeness that the Son of God will bring later in His First Coming. So. It's about liberating yourself during hard work. The mind in monotonous movements is not attached to activity, for it is all there in the Eternal Council within its limits. Nothing distracts a person from his ecstasy. Now it remains to regulate this condition of life in public education, so that the joy of some does not intersect with the joy of others, so that everyone's joy is supplemented by the joy of one's neighbor. This is another revolutionary step in the evolution of formation,.

## **Initially Rus**

I will take the evidence that the monastery-settlement is a natural way of life of the ancient Slavs. Just the labor joy of being inevitably needed an organizer. Archaeological finds confirm the obvious - the leader of the tribe was, in the first place, a spiritual leader. He needed special conditions for communion with God for greater being in happiness. In this principle-scheme, in which the leader was the confessor of the tribe, the formation of statehood began. Spiritual leaders, like the most powerful ascetics, needed the patronage of their own people in order to receive mutual spiritual protection of the spiritual leader. Hence harmoniously follows the organization of the spiritual self-liberation of the surrounding spiritual center of the community, its constant improvement is inevitable. Then, in Orthodox Russia, a system of bells emerged, as the highest achievement of scientific and technological progress. Now a person, through withdrawal from himself in the type of Vedic nirvana, being far from the worship in the Temple, by means of notification, participates in the Divine Liturgy, switching his attention to one aspect or face of happiness, then to the other. On debt, without delaying for some joy, he gradually shifts to another co-organizing with the processes that take place behind the high monastic walls. The peasant, being in ecstasy, at the same time becomes a part of one Body. He is understandable to his neighbor, for he complements his joy with his joy. Thus, every member of the tribe becomes a coherent common cause. With the liturgical cycle, all facets of human nature were taken into account. In the same number of sexual relations, but again in strictly defined time limits and in its allotted time for this - so that there is no more than permitted by the general current of joy. This applies to meals.

## Recreation

Please note that I have not said anything about rest here, but it is stipulated only that there should be a smooth transition from one joy to another, without delays beyond the permitted predestination by nature itself. Any joy in moderation, outside of which a person loses it and may even die. There is no rest, but only a change in activity. Of course, it's impossible to live without rest, but a person should know that rest is evil, that is, although he will always have a rest, but he must condemn himself in his soul. Rest of life does not happen - this is death. Just like a person does not seek rest for his lungs, the work of the heart and other organs of the body. This is the key moment of the ancient Slavic tradition, as, indeed, for Ancient China, this was the norm of all austerities. Unfortunately, now there are communities that call the ancient Slavic tradition a perversion that came to us from ancient Greece under the guise of the Enlightenment, Catholicism and other things. Alternatives to asceticism at the maximum expressed in Orthodoxy are not in the nature of the universe.

#### Modernity

As is known, when the scientific community embodies scientific developments in life, it tries to accept the physiology of man as it is. But for some reason, the body of the people is not called part of the physiology in the image previously voiced. But without this there is no future. The scientific and technological revolution began at the very first moment of man's appearance on the Earth, from the appearance of the language and ending with the modern broadcasting of divine services through the Internet. The word, in itself, is the help of the mind to remain in union with the Creator, just as the lame need a walking stick. Because the word, as an instrument, if it does not participate in the most sacred action, it becomes an instrument of killing life. This applies to all scientific progress. It is for this very reason that the monastery-village, like the nature of human physiology, can be improved from the scientific community only in one perspective - to make participation in the divine service more accessible. So that even people tied to a bed or in space, or somewhere far away, could stay in it. But not as it was done before now - they commit crimes. This point should be particularly worked out and giving a different definition to a person, to approve new laws of society.

Further, this idea has sense to develop on conceptual systems of mathematics, physics, economics, biology and Russian hand-to-hand combat. But it will be done in other articles.

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#### 力学中最常用物理术语的词源分析

# Etymological analysis of the most frequently used physical terms in mechanics

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由于科学的快速发展,出现了新的术语和概念,而这些术语和概念又是 多义的。 他们的写作出现了许多版本,并且需要定义其形成的共同科学 原理。 这篇文章致力于对一些物理名词的词源分析,这可能有助于找出时 间,语言以及其中一些形成的方式。

关键词:语言,术语,术语,词源,分析,词汇,形成。

Annotation. Due to the fast development of science there appear new terms and notions which, in their turn, are polysemantic. There appear many versions of their writing and necessity of defining of common scientific principles of their formation. The article is devoted to the etymological analysis of some physical terms, which could contribute to finding out the time, the language, and the ways of forming of some of them.

Keywords: language, term, terminology, etymology, analysis, word, formation.

A term from Latin *terminus* 'border, limit, end' is a special word or word-combination which is accepted in a certain professional sphere and is used for special purposes. A term is verbal denotation of the concept included in the system of vocabulary of a certain area of professional knowledge. Terminology (as totality of terms) makes the autonomous sector of any national language, closely associated with professional activity. Terms of every branch of science form systems determined, first of all, by concept connections of professional knowledge to express these connections by language means.

In this research it is assumed to conduct the etymological analysis of the most used physical terms in mechanics. Physical terminology is a large layer of vocabulary, by which new knowledge is fixed; objects are designated in the field of physics. In addition, it helps to provide transmission and perception of different scientific information. Realized is the process of communication between specialists. Terminology in physics as in any other sphere of scientific knowledge has a purposeful character of appearance, stability and monosemy in scientific speech.

Etymological analysis of a word will be used for the research of the origin of terms. Etymological analysis is the process of finding out existing morphological structure of a word, its word-formation connections in the past, determination of the source and the time of its emergence, establishment of the method of its formation from corresponding productive basis [4]. Etymological analysis of a word is not limited by determination of how the word was divided before, by what method and the base of what forms it was realized on. The tasks to be considered by etymological analysis include: 1) determination of whether the word has native or adopted character of its formation; 2) finding out the notion that was fixed in the basis of the word as a phenomenon of reality; 3) setting up the time, the method, and the ways of its emergence in the language; 4) reconstruction of his initial value [3]. An etymological analysis is determination of the initial structure of the word existing before, its initial word-formation ways. That is, if a traditional word-formation analysis has to explain the structure of word and its present time life, etymological analysis is the means of finding out the past life of the word. In our research an attempt to understand the origin of some physical terms, finding out their native roots are undertaken

Mechanics from Greek "art of construction of machines" is the part of physics studying motion of material bodies and cooperation between them. In the work considered and analysed are such physical terms frequently used in the field of mechanics as *velocity- скорость, scalar – скалярная величина, oscillation – колебания, acceleration – ускорение* and so on.

Having analyzed each of the terms, we made classifications on the following groups [2]:

- 1. the period of their emergence;
- 2. the language they origininated from;
- 3. the way they were formed;

4. their native root.

Mainly, the physical terms we are considering in our research were formed during the period of 13-16 centuries. It is necessary to point out to the terms the emergence of which is due to well-known scientists. These scientists introduced new physical terms while making their discoveries. In 1807 Thomas Young was the first who used the term "energy", in 1853 William Renkin used "Potential energy" first, Joule. K. Maxwell was the first to use the term "field" to describe the electromagnetic phenomena, etc.

One of the most important ways of forming terms is borrowings from foreign languages, since this way often provides more unambiguity and certainty of these words. The languages the physical terms appeared from and "came" into modern English are:

- Latin (velocity, vector, particle, torque etc.)
- French (inclined plane, deformation, space);
- Greek (kinetic energy);
- Old English (work, field, rigid body);
- German (weight, path).

It is important to note that there are some terms that originated from several languages simultaneously, for example, from French and Latin (relativity, lever, triction, oscillation etc.), Latin and Greek (mass, power), French and Greek (mechanics, dynamics, kinematics).

According to our research the ways of word-formation are:

We have found out four ways of word-formation:

- Prefixes (reaction);
- Suffixes (inertia; mechanics, dynamics, displacement, etc.);
- Conversion (coordinate, work, trend, torque, etc.);
- Compounding (equilibrium (equal+libra).

Special attention should be paid to the fact of transition of commonly used words into the terminology stratum. For example, the term "field" in the common sense is a treeless plain, a piece of land (according to Ozhegov), and in physics it came as a term in the 19th century (like in mathematics) in the meaning of a part of the space in which one could find some physical interaction (strong, weak, electromagnetic, gravitational, etc.).

The terms taken in the framework of our study have a Proto-Indo-European origin. The Proto-Indo-European language as the one that gave beginning to the Russian, the Latin, and the English languages, appeared in the valleys to the north of the Black and the Caspian seas. The meaning of its roots roots formed the basis for the formation of terms and their definitions. The following roots convey the meaning of terms:

**\*wegh**-Proto-Indo-European root meaning "to go, move, transport in a vehicle" (for example, velocity, vector);

\*meue- Proto-Indo-European root meaning "to push away" (for example, motion, moment, moment);

**\*poti** - Proto-Indo-European root meaning "powerful" (for example, power, potentional energy);

\*keie - Proto-Indo-European root meaning "to set in motion" (for example, kinematics, kinetic energy).

It is worth telling about the terms the original roots of which were lost (accel-

eration, trend, relativity, coordinate) [1]. The results of the research showed that the main layer of terminology in the field of mechanics is characterized by the presence of terms that were formed in a certain time or appeared due to technological progress; which are the result of the improvement and transformation of roots originating in the Proto-Indo-European language.

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作为语言和文化对象的错误言论 (以中国学生的错误为例) Error speech as an object of language and culture (on the example of errors of Chinese students)

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文章认为语言错误是各种科学学科(语言学,心理语言学,语言文化学 和语言学)的一个对象。这种方法使我们不仅能够判断学生语言和语言文 化能力的形成程度,还能够判断出现语言错误的机制,并考虑学生在解决 交流困难时采取的交际策略。作者分析了在西伯利亚联邦大学学习俄语的 中国学生的言语错误。

关键词: 言语错误, 世界语言图像, 语言类型, 交际策略

Annotation. The article considers speech error as an object of various scientific disciplines (linguistics, psycholinguistics, linguoculturology and linguodidactics). This approach allows us to judge not only the degree of the formation of linguistic and linguocultural competence among students, but also to identify mechanisms for the occurrence of speech errors, to consider communicative strategies that students resort to in solving communicative difficulties. The author analyzes the speech errors of Chinese students who studied Russian at the Siberian Federal University.

*Keywords*: speech error, language picture of the world, language type, communicative strategies.

Learning the language in the context of culture has become a priority in modern linguistic research. Speech errors thus serves as an object of linguistic research, psycholinguistics, cultural linguistics and linguistics, as it allows (1) to look at the foreign language through the prism of their native language, (2) to judge the similarities and differences between the national picture of the world, (3) consciously and subconsciously interpret processes mastering a foreign language, (4) to determine the principles for the submission of educational material in a foreign-language audience.

The theoretical basis of the study was the work of domestic and foreign scientists (U. Weinreich, Coseriu E., Wierzbicka A., J. Lakoff, L.V. Shherba,

R.O. Jakobson, E.M. Vereshchagin, L.S. Vygotsky, N.I. Zhinkin, I.A. Zimnyaya, A.R. Luria, A.N. Leontiev, A.A. Leontiev, A.V. Bondarko, Y.N. Karaulov, Yu.S. Stepanov, E.I. Passov, V.N. Yartseva, etc.).

(1) The traditional approach to speech error (SE further) allows to identify the structural, semantic and formal differences that arise when two or more languages come into contact, ie, SE views it as an interference phenomenon. It should be noted that similar differences can be caused, on the one hand, by the typological specificity of the language (the way of expression of grammatical meaning, the degree of morphologization, the features of the functioning of linguistic units), on the other hand, the result of the dissimilarity of grammatical systems in which the sum of meanings ), important for this lingvocultural community.

Thus, the Russian (inflective type of language) and the Chinese (agglutinative type of language) have their own peculiarities of the internal structure of the word and the rules of its functioning, which leads to certain problems in the study of the Russian language as a foreign language. First of all, this is the problem of grammatical wording and the problem of expressing syntactic relations. High morphologization of the Russian word leads to the induction of one form of the word in another, so the coordination and morphologically expressed control are the dominant types of connection and a certain marker of the syntactic role of the word in the Russian sentence. Therefore, the typical mistakes are the violation of harmonization and management in the Russian language (*moŭ mempade, Я читать книга.*)

Russian and Chinese languages, like the two cognitive systems of the worldview, represent a different set of meanings grammatically expressed in the language. Therefore, when studying Russian as a foreign language, Chinese students meet (a) SE related to the expression of categories not found in the Chinese language: verb form, case of nouns, adjective pronouns: (Обычно я прочитать книга 2 день.); (b) SE related to the functioning of the grammatical categories present in both languages. For example, the category of animation in the Russian language requires the observance of certain rules of case selection (Я пошёл в бабушку// к бабушке; Я вижу друг// друга); when the verbs of motion are functioning, one should distinguish between the sign of location / orientation (Я ходил на почте. Я был на noчmy// ходил + куда? был + где?); when expressing temporary relationships, students ignore the principle of absoluteness / relativity of temporal orientation in Russian (Когда я была маленькая, я хочу стать учительницей); (c) SE, caused by the influence of the Chinese language. For example, students do not use inanimate plural nouns (Я люблю яблоко. Мы любим читать книгу и смотреть фильм), do not make out the Russian verb, leaving it in the form of an infinitive, and nouns in the nominative case: (Я писать слова. Мы гулять город).

## Scientific research of the SCO countries: synergy and integration

(2) Linguistic and cultural errors reflect the process of socialization and inculturation of a person in a certain linguistic culture. Among the most frequent errors are (a) SE, associated with violation of speech etiquette (*Как твоё здоровье, учитель?*); (b) SE, caused by the lack of knowledge of any regional information (*Я хочу купить килограмм яиц. В какой провинции вы живёте? Он выпил тарелку супа.*); (c) SE, representing a fragment of the mental space of Chinese culture using the means of the Russian language. Such errors are caused by a mismatch in the presentation of the same concepts in Russian and Chinese languages: a different set of conceptual components of the same concept in two languages, the frequency of associates, the difference in the interpretation component of the same concept: (*Я уважаю и люблю своих учителей. Я не только получаю от них знания, но чувствую их заботу и внимание. Учитель, как свеча, всегда освещает другим путь к счастью.*).

(3) SE as an object of psycholinguistics actualizes issues related to the speechactivity of bilingual (mechanisms of generating SE and strategies for using the language). Interference, analogy, association and transfer are the mechanisms. Thus, linguistic errors are most often the result of interference and false analogy, and linguistic-cultural errors are the transfer and association. This is due to the type of knowledge: linguistic or non-linguistic.

As an explicator of mental strategies, SE advocates (a) the initial stages of learning in the transfer strategy (the translation of knowledge from native to foreign) and the strategy of reducing information in communicative difficulties; (b) in the advanced stages of training: in the strategy of paraphrasing (word-making, the replacement of the word with a description) and strategies of supergeneration (the spread of the already existing knowledge of a foreign language to its new forms).

(4) SE as an object of linguodidactics allows one to look at the study of a foreign language as a multifaceted phenomenon and to reflect this in the learning process. The teaching of Russian as a foreign language should include (a) teaching the language proper (phonetics, vocabulary, grammar, etc., idioethnic features of the linguistic representation of universal meanings), (b) the interpretation of culture (the existence in the language and culture of certain phenomena , key concepts, value systems, rules for building communicative acts, culturally-driven behavioral strategies, etc.), (c) studying the mechanisms of bilingual speech at different levels of language proficiency, (d) taking into account the specifics of the training systems Who formed the student and imposed on him as part of their school education are certain rules of behavior and cognitive learning strategies.

As a conclusion, it should be noted that:

1. SE is a multidimensional phenomenon and lies in the sphere of interests of various scientific disciplines: linguistics, psycholinguistics, linguoculturology,

linguodidactics.

2. SE allows you to identify difficult areas for the student grammar and organize the learning process, taking into account the contrasting features of the two contacting languages.

3. SE makes it possible to judge the similarity and difference of national world views of representatives of different contacting cultures, which is expressed in the structure of concepts and in a set of binding meanings encoded in the grammatical systems of languages.

4. SE demonstrates the mental processes that occur in the student's speech activity in a foreign language, which allows the development of certain requirements for educational materials designed to prevent erroneous speech actions and promote a more successful learning of a foreign language.

语言文化交流: 诗歌Mogilevskogo时期的作用 Linguocultural communication: the role of poetry Mogilevskogo period

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文章论述了哈卡族,卡拉卡尔派克族和诺盖族人之间的语言和文化关系 以及诺盖时期诗歌的作用。以及跨文化交流作为文化的直接互动。

关键词:跨文化交际,沟通,诺盖时代,诺盖族部落,文化交织,奇普切诺盖分支。

Annotation. The article deals with the linguistic and cultural relationship between the Kazakh, Karakalpak and Nogai peoples and the role of poetry of the Nogai period. As well as intercultural communication as a direct interaction of cultures.

*Keywords*: Intercultural communication, communication, Nogai period, Nogai Horde, culture intertwined, Kipchak-Nogai branch.

The first who conceived the changed world situation were linguists, for whom inseparable connection always was evident and doubtless. On the one hand, language is a system which allows collecting, keeping and sharing information gathered by collective consciousness during the decades. But on the other hand, the similar function of keeping and sharing collective knowledge is performed by culture that according to Y.M.Lotman is defined as a complex of non-heritably received information, and methods of organizing and keeping it. Therefore language and culture interact constantly: "Culture and language coexist in a dialogue with each other" [1].

Over the last years, the issues of international contacts and intercultural communications have become very popular.

*Intercultural communication* is a "process of direct cultural interaction, and the whole process of such interaction is performed under incongruous (partially, substantially and sometimes entirely incongruous) national stereotypes of mind and behavior, and this has a big influence on mutual understanding of the parts

during communication process [2, p.97].

In modern times due to intercultural communications intensification, one of the main cultural problems is the problem of possible lose of national originality of people in the future. The first and the best guarantee of preventing this problem is the perception of national languages self-worth as reflection of inimitable habit of thought.

The XIV-XVI centuries' the Kazakh, Nogai and Karakalpak poetries were established in the Nogai Orda and in subsequent periods they strictly kept the main national traditions of those times.

Research of onomastic names occurred in Nogaily-Kipchak songs, investigation and development of semantics of non-etymologized words makes an opportunity to illuminate lexis of the given languages.

The Nogai Orda separated from the Golden Orda in the end of XIV century. Many of its tribes moved from the river Ural to the Dnepr, and the Nizhnee Povolzhie, Northern Caucasus and Krym as well. In the XVI century it was divided on the Big and Small Ordas, which were desintegrated further afterwards. The Big Nogai Orda migrated to the Nizhnee Povolzhie, the Small Orda – to the Kuban's right coast, the Azov coast and the south of Ukraine, between the Dnepr and the Don rivers. The Nogai people heroically protected their motherland from foreign enemies, fighting during centuries. However, domestic disagreements and civil did not give them the opportunity to unite.

In the XVI century after the Kazan, Astrahan and Front Caucasus khanates had joined Russia there was a problem about the Nogai Orda's future. Weaken by feuds and fight for the power, it had to join Russia, and part of them joined the Kazakhs.

In the beginning of the XVII century the Nogai people separated into three groups: two of them lived in the Kuban and the Priazovie, Tereke and Volga coast. The third part settled in the east of Ural and lost their identity after joining Kazakh, Tatar and Bashkir nations.

The Nogai people have their unique and original culture. But the constant untoward political situation and life conditions in the past interfered into the whole development of the culture. The Nogais have very rich eposes, which are not investigated completely nowadays [3, 365].

Numerous legends, fairy-tales, poems, eposes, traditions and customs of Kazakhs and Nogais are similar. Saved as heritage ancient tribes' legends and fairy are very valuable for both nations. They are such fairy-tales and legends as "Ertostik", "Zhirenshe Sheshen", "Aldar Kose", and there are such epic poems as "Alpamys", "Koblandy", "Kambar", "Er Targyn", "Er Kosai", "Er Syin", "Edige", "Er Zhabai", "Er Shora", "Orak Mamai", "Krym's 40 Batyrs" and others. Epos is the most significant creation of the Nogais' intellectual

culture. It reflects the historical way of people, their spirit and wisdom.

The first samples of that era's national folklore taken from the Astrakhan Nogais were written by the Nogai poet Ali-bek Sharapov in 1890. A.I.-M. Sinkaliev (Sheihaliev), "The Nogai Heroic Epos" book's author, writes that the heroic epos "Edige" was translated to Persian by A.Sharapov and A.Hodzko, and then it was published in English in London in 1942. This epos attracted attention of pre-revolutionary explorers. Another variant of this epos was recorded from the Nogais by Ch.Valihanov, Kazakh enlightener, in the 50s of the XIX century. In 1883 Magomed Osmanov, the Kumyk poet, recorded the Nogai akyns poems that are dear for Kazakh people as well: "Asankaigy", Syrym, Shalgiz, Dospambet, Zhiembet, Kaztugan songs, etc.

The Nogai language was formed in the area of Kipchak tribes who were the part of the Kipchaks-Polovec tribes units living in the Golden Orda and later, in the Big Nogai Orda. The modern Nogai language belongs to the Kipchak group of Turkic languages, forming the Kipchak-Nogai subgroup. According to its vocabulary, phonetics and grammar the Nogai language is the closest language to Kazakh and Karakalpak. These three languages are characterized by their importance on all stages of language structure. Before separating the Nogai, Kazakh and Karakalpak languages, people – native speakers – belonged to one community – the Nogai Orda. These three languages are characterized by the conformity of the sounds *ch-sh*, *sh-s*, *y-zh*. For example, *shyk* (go out), *tas* (stone), *zhok* (no), instead of *chyk*, *tash* and *yok* in other Turkic languages.

The languages of the Kipchak-Nogai branch were the latest formed from the Kipchak group of languages. The period of appearance, distribution and formation corresponds to the Golden Orda era. To this branch that was formed in the XIV-XVI centuries refer the Kazakh, Nogai, Karakalpak languages and Uzbek language's Kipchak dialect. The named languages have the following peculiarities:

- sound *ch* is absent, instead of it sound *sh* is used;
- sound *sh* is changed to *s* sound;
- Sounds n/d/t interchange.

Thus, according to A.N.Baskakov classification, languages of zhyrs (poems) and eposes which were written during the Nogaily period belong to the Nogai-Kipchak branch of the West-Hun branch of the Turkic languages.

The Nogaily era's language is considered to be the origin of modern Kazakh, Tatar, Karakalpak, Kumyk, Bashkurt, Kyrgyz languages. And it is a continuation of the Old Turkic and Middle Turkic languages. Nowadays number of speakers of this language is about 54 thousand people [4, 335].

Those times zhyrs' languages that are discussed in the given topic are rich with ancient lexical phrases and phraseological units. There are found similarities between zhyrs and sagas of the poets of the XIV-XVI centuries. Therefore we

can make a conclusion that languages of zhyrs and sagas correspond to the requirements of folk literature language of that time.

Similarities of two brotherly ethnos like Nogais and Kazakhs can be found not only in their way of life, housekeeping, traditions and customs, culture, but in languages as well.

In Professor N.H Suyunova's opinion, Old Turkic literature's translation on modern Turkic languages would enrich spiritual culture of Turkic people, positively and directly influencing literature processes. But today we research not direct but historical-genetic influence through continuous oral tradition of historical and linguistic memory of Turkic nations. Thereby, for instance, the Old Turkic literature's images and grounds were saved in the XX century's Nogai literature works.

Every nation is experiencing social, public and cultural changes. Such historical changes leave an imprint on these nations' languages. The Nogaily period language is a model of oral literature language and cultural linguistic connection between the Kazakh, Nogai, Karakalpak and other Turkic languages as well.

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## 借词作为丰富词汇语义子系统的一种手段"俄罗斯教育" Borrowings as a means of enrichment of the lexical-semantic subsystem "Russian education"

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本文致力于研究俄罗斯教育由于借贷而对社会因素词汇 - 语义子系统 影响较为敏感的更新过程。 给出了当代俄语词汇语义子系统"俄语教育" 词汇的主要方向和发展过程。 特别关注内部借贷的特点,即借用的词汇和 短语单位指的是以前没有与教育有关的概念领域。

关键词:词汇语义子系统,俄罗斯教育,外部借贷,内部借贷,校准。

Annotation. This article is devoted to the study of the updating processes of a rather sensitive to the influence of social factors lexical-semantic subsystem of Russian education due to the borrowings. There is given a description of the main directions and developmental processes of the lexical-semantic subsystem 'Russian education' vocabulary in contemporary Russian. Particular attention is given to the inner borrowings characteristic, that is, borrowed lexical and phraseological units referring to conceptual spheres not previously connected to education.

*Keywords*: lexical-semantic sub-system, Russian education, external borrowings, inner borrowings, calquing.

The problem of the updating of the Russian lexical system became up-to-date in the 2000s. The modern stage of the development of Russian society, which is sometimes called 'the newest', 'postindustrial', 'the period of globalization' and etc., is characterized by significant changes in all spheres of life: in politics, economy, culture and education. Social changes of a modern period influence the situation with the language, whose distinctive feature is the dynamism which can be seen in all subsystems of the Russian vocabulary [4].

In our opinion, the most interesting of all are the linguistic processes dealing with a rather sensitive to the influence of social factors lexical subsystem of the semantic field 'Russian education'. A lot of academics consider the education sphere as the field which is strategically important for Russia and highlight its great importance to the modern life. Indeed, currently the sphere under consideration is 'one of the powerful, really existing spheres of social policy which enables to realize the process of producing new social experience and also building in the public consciousness new milestones in the development of the society, a region or a particular human being'[1].

As the survey showed, the features of the vocabulary development of the subsystem 'education' in contemporary Russian are as follows:

1) a massive introduction of borrowings from American English

It is known that a lot of innovations in modern education come to Russia from Western cultures, which lead to the expansion of the conceptual system of the sphere under consideration, which is used for denotation of related educational realia by usage borrowed lexical units, especially from the American variant of English. Among them are the namings of new educational concepts and models (e.g, collaborative learning, learning city, etc.), the new methods of organizing the educational process (e.g., webinar, 'case-study' in the meaning of 'the method of organizing distant learning based on the usage of textual, audio or multimedia teaching and learning materials and their distribution to the students for the studying by themselves with the constant distant interaction between the teacher and other students'; 'an online seminar' in the meaning of 'a type of a web-conference, an online meeting or a real-time presentation via the Internet'; 'chat-lesson' in the meaning of 'a lesson which is held online and based on strict formulating of problem questions with the opportunity to record the script of the lesson for further analysis and usage' and etc.) and also new names for the participants of an educational process ('a tutor' in the meaning of 'a professional mentor, who is responsible for the academic performance and the development of the personality', 'a facilitator' in the meaning of 'a man who maintains successful group communication', 'an advisor' and etc.) [8].

A special category of borrowings is represented by phraseological calques which appeared owing to the literate translations of foreign expressions in parts (e.g., formal education – an organization of education which meets five main requirements to learning – teaching in special places, by qualified personnel, leading to the obtaining of a generally accepted document, systematic and characterized by students' targeted activity; informal education – non-organized learning, which doesn't meet any requirements characterizing the formal education; open learning – a type of organizing an educational process based on the principle of freedom in choosing the time, the place, the duration, the cost, the aims, the methods, the sources, the assessment, the supervisors and etc.; multicultural education, electronic learning, standards-based education, outcome-based education, competency-based education / learning, mobile learning and etc.).

2) Active usage of compound foreign words for denomination of new phenomena and terms in Russian educational system as a result of the speech effort economy law (e.g., case-study, display-class, online-intensive, slide-lecture, online university and etc.).

Among foreign innovations used as compound term components are: borrowed neologisms adapted to Russian (business education, business college, etc.), new foreign words which have not been introduced into Russian yet (e.g., a tutor teacher, a tutor manager, a distant tutor, case-study, offline learning, a supervisor, etc.), barbarisms (e.g., a smart teacher, a smart university, smart education, a smart course book, etc.).

External borrowings are regarded as so-called 'strong' lexical innovations and represent 'brand new for the Russian language lexemes which are different in their original forms' [5].

3) The return into active usage of re-oriented lexemes, which were connected with foreign realia before;

Nominatively re-oriented lexis refers to lexical units which during the previous period (in Soviet times) denoted different realia of foreign and / or pre-revolutionary Russian life and nowadays are means of denomination modern Russian realia (e.g., a college, a lyceum, a progymnasium, a bachelor, a master, etc.) [3]. The conversion of these words from passive vocabulary into active as a result of nominative re-orientation led to the changes in the pragmatic properties – loss of temporal-stylistic (in pre-revolutionary Russia, etc.) and / or locative (in foreign countries, in bourgeois countries, etc.) ideologized denotative semes and therefore stylistic marks which went with their definition in lexicographical issues of the Soviet period.

It is worth mentioning that the plane of content of some actualized verbal signs can undergo some semantic changes. For example, the meaning of the word 'a Master candidate' in defining dictionaries of a Soviet period was as follows: 'a person who is preparing for the defense of their Master's thesis in some foreign countries and in pre-revolutionary Russia' [2]. As it is seen, the core elements of the sense, forming the meaning of a lexeme 'a Master candidate' were semantic complexes 'the defense of a thesis', 'a Master candidate', 'a period of time from an exam to the defense of a thesis'. Compare the contemporary meaning: 'a Master candidate is a student who is having his Master course'. In the content of a linguistic sign 'a Master candidate' the semantic transformation took place: the core elements now are 'a student', 'a Master course', while sense elements 'a defense of a thesis', though saved in the semantic structure, transform from explicit into implicit ones. A complex of semes 'a period from an exam to a defense of a Master's thesis' was lost owing to its irrelevance.

Actualized verbal signs, which underwent semantic changes, of this type often form new syntagmatic connections and relations. Compare new phrases which denote new types of educational institutions: a cadet boarding school for girls, a Sunday school, a building college of a university, a pedagogical institute of a university, a juridical institute of an academy and etc.

4) An active functioning in the studied subsystem of inner borrowings, i.e. borrowed lexical and phraseological units referring to other spheres [firstly, to the sphere of economy (e.g., a manager, management, marketing, audit, etc.), IT (e.g., the Internet, a site, a chat, a blogger, electronic, etc), technical-scientific (e.g., a technological map – a description of a process by a step-by-step guide (often with graphics) with mentioning of used tools; innovations, etc.), a service industry and advertising (e.g., a brand, a promo, etc.)]. When denoting realia of an educational sphere these units are used in phrases which 'specify' a sphere of usage of the phenomenon (university management, audit of the institution's activities, institution's efficiency, higher education market, an educational services marketing, virtual classrooms, an electronic diary, an electronic board, net educational programmes, distant learning, a virtual lecture, an educational cluster, etc.).

Extralinguistic causes result in the development of syntagmatic connections of 'transferred' linguistic signs of a studied denotative sphere. We registered combinations in which new phenomena of a Russian educational sphere are reflected: an electronic diary, an electronic classbook, an interactive board, an interactive classroom, etc.).

New syntagmatic of these lexical units stimulated the forming of new paradigmatic relations: a printed book – an electronic book, an ordinary board – an interactive board, an ordinary classroom – a mobile interactive classroom, etc.).

5) An increase in the frequency of usage of jargonisms created on the basis of borrowed lexemes. As the analysis shows, among the substandard vocabulary, functioning in the educational sphere, the following types of borrowed units can be distinguished:

a) direct borrowings (lexical units, genetically related in the meaning to the unit of a parent language)

It is possible to mark the differences in mastering of a foreign word in a literate language and in substandard: as a rule, in a literate language, foreign units undergo practical transcription, while in jargon transliteration if often used [6]. Among such jargonisms, mastering of which is oriented not on the phonetic, but on the graphic shape of a borrowed lexeme, can be mentioned: [sca'la] – a school. Herewith, transliterated jargon lexemes are grammatically adjusted to the laws of the Russian language and often acquire the inflection of a feminine gender.

b) hybrids (verbal signs created by the adding to a foreign root a Russian affix);

In the studied subsystem such units as ['askat'] (to ask), ['seivit'] (to save) and etc. function as words-hybrids.

Some of the hybrids can be formed from English roots with the help of prefixes, e.g, [za'seivit'], [bezander'stand] – about a stupid person, who does not understand something. In the process of the creation of a jargonism on the basis of a foreign root element in some cases there is a change of a word-etymon.

In our material units characterized by a special processing of a foreign word are mentioned. Jargonisms formed by means of apocope are frequent: [sabzh] – a topic (from 'subject'), [infa] – information, [ad'min] – an administraror, [komp] – a computer and etc.

c) words formed by a linguistic game in order to create a foreign shape of the word (e.g., [tru:ll] – a trillion).

Foreign lexemes can be used for veiling the sense of the phenomenon related to the studied thematic sphere in order to soften rude and offensive expressions ('deviant behavior' instead of 'deviant from social norms behavior, 'inclusive education' instead of 'providing an access to education for everybody, including disabled children'). The processes of eufimization in the sphere of contemporary Russian education prove the forming and the development in conscience of modern Russian speakers the system of linguacultural values and 'the foundation of new moral and ethical model of the society' [7].

Inner borrowings refer to so-called 'weak' lexical innovations and are represented by semantic innovations caused by transformations in a semantic structure of a lexical unit on the whole or by transformations in content of denotative and connotative components of word meaning and functional and semantic innovations connected with the processes of passivisation and actualization of verbal signs of a lexical-semantic subsystem of a thematic sphere 'education' and also with enlargement of an analyzed subsystem owing to the vocabulary of limited usage [5].

The following conclusion can be drawn: the social and political conditions which appeared in modern Russia defined a special openness of the Russian society to borrowings which has led to the change in the functional status of English and initiated not only quantitative, but also qualitative (deep semantic) changes in the subsystem of contemporary Russian education.

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8. Zavarzina V.A. Lexical innovations in the semantic field of "Education" in contemporary Russian// Problemy lingvistiki i metodiki prepodavanija inostrannyh jazykov. – Voronezh: VSU, 2017 - 118-120 pp. 根据联邦国家教育标准,为脑瘫儿童和肌肉骨骼系统疾病创造复杂的有区别的矫正 - 开发和康复辅助模型,作为掌握适应的普通教育基础普通教育 计划的条件

Creation of a model of complex differentiated correctional-developing and rehabilitation aid for children with cerebral palsy and disorders of the musculoskeletal system as a condition for mastering the adapted basic general education program of general education in accordance with the federal state educational standard

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从罗斯托夫地区教育发展的优先方向出发,其中之一是创建教育模式, 旨在改善各类公民的优质教育,无论居住地,社会地位和健康状况如何 在 该地区目前的情况下,存在一个社会重要问题,这与需要以更广泛的形式 为脑瘫儿童和肌肉骨骼系统疾病提供全面护理相关。

关键词:小儿脑瘫,康复,有限的健康机会,综合方法,支持。

Annotation. Proceeding from the priority directions of the development of the education of the Rostov region, one of which is the creation of educational models aimed at improving the accessibility of quality education for all categories of citizens, regardless of place of residence, social status and health status, in the current situation in the region there is a socially significant problem, associated with the need to provide comprehensive care for children with cerebral palsy and disorders of the musculoskeletal system in a more extended form.

*Keywords: infantile cerebral palsy, rehabilitation, limited health opportunities, integrated approach, support.* 

Volgodonsk Special Boarding School "Voshozhdenie" created conditions for obtaining quality education, treatment and rehabilitation of students with infantile cerebral palsy and musculoskeletal disorders and accumulated extensive experience in accompanying children of this category, which may be in demand by other educational institutions, specialists and parents of children of the target group.

In the boarding school, they receive education and comprehensive correctional-educational and therapeutic-rehabilitation students who have cerebral palsy and disorders of the musculoskeletal system, according to the license for educational and medical activities.

Volgodonsk Special Boarding School "Voshozhdenie" for the last 4 years has held 1 leading place in the Rostov Region in the ranking of special general education institutions in terms of the efficiency of public services. Establishment following the results of the All-Russian and International competitions is included in the 100 best schools and enterprises of Russia, has the sign of quality "Best to Children", was awarded 8 gold medals for the introduction of promising forms, methods and means of improving work and is the holder of the "Gold Certificate" for organizing health-saving activities.

With a child with cerebral palsy and disorders of the musculoskeletal system and families raising them, a team of teachers, specialists and medical workers works, providing a unified approach to comprehensive psychological, pedagogical and medico-social support. Each student of the boarding school receives quality medical and rehabilitation care without interruption from the educational process.

The activity of the specialists of the interdisciplinary team of the educational institution is aimed at helping children with cerebral palsy and disorders of the musculoskeletal system, as well as children with disabilities. It includes the provision of skilled family-centered care for the child and the family in order to promote the optimal development and adaptation in society of a child with health and development problems. The team of specialists includes: neurologist, orthopedic traumatologist, exercise therapy instructor, teacher-psychologist, teacher-defectologist, teacher-speech therapist, social teacher, instructor in physical culture.

In the institution there is a regional Consultative Center on the provision of methodological, psychological and pedagogical advice to parents (legal representatives), ensuring the unity and continuity of family and public education, raising the pedagogical competence of parents (legal representatives), raising children with cerebral palsy and musculoskeletal disorders apparatus.

In the course of the work, information was analyzed on the number of children with cerebral palsy and disorders of the musculoskeletal system in the Rostov region and the current practice in the region of providing comprehensive assistance to children of this category in the conditions of educational institutions.

The analysis of the information showed that special conditions for obtaining education for children with disabilities (with disorders of the musculoskeletal system) from the number having recommendations of the psychological, medical and pedagogical commission were created:

- for 55% of preschool children in 5 territories of the region;

- for 67% of school-age children in 6 municipalities of the region.

According to the central psycho-medical and pedagogical commission for the last 3 years in the Rostov region, there has been an increase in the number of chil-

dren with musculoskeletal disorders, including multiple disorders.

Rehabilitation and medical support of children with cerebral palsy and disorders of the musculoskeletal system is carried out on the basis of medical institutions and rehabilitation centers and requires a long-term impact. The approaches to rendering assistance in the territories of the Rostov region are different, and in some cases the corresponding services are insufficient to correct and rehabilitate abnormalities in the development of a child with cerebral palsy and disorders of the musculoskeletal system, and the principles of continuity and family orientation of comprehensive care are not observed.

Thus, proceeding from the priority directions of the development of education in the Rostov region, one of which is the creation of educational models aimed at improving the accessibility of quality education for all categories of citizens, regardless of place of residence, social status and health status, in the current situation in the region there is a socially a significant problem associated with the need to provide comprehensive care for children with cerebral palsy and disorders of the musculoskeletal system in a more extended form.

- an increase in the number of children with cerebral palsy and disorders of the musculoskeletal system in the region and the need to improve assistance to them;

- Deficiency in the region of institutions, especially preschool, for children with cerebral palsy and disorders of the musculoskeletal system;

- Experience in accompanying children with cerebral palsy and disorders of the musculoskeletal system accumulated in the educational practice of the board-ing school;

- high efficiency of comprehensive care for students of boarding schools with cerebral palsy and disorders of the musculoskeletal system.

*The purpose of the innovative project:* development of conceptual bases and models for the implementation of the system of complex differentiated corrective-developing and rehabilitation care for children with cerebral palsy and disorders of the musculoskeletal system as a condition for mastering the adapted basic general educational program of general education in accordance with the federal state educational standard, effective rehabilitation and successful social adaptation.

**Object** - theory and practice of complex differentiated correctional and developmental care for children with cerebral palsy and disorders of the musculoskeletal system.

*The subject of the research* is the systemic process of complex differentiated correctional-developing and rehabilitation care for children with cerebral palsy and disorders of the musculoskeletal system.

*The hypothesis of the research* was the assumption that the systemic approach and specially organized conditions for interaction between specialists in psycho-

logical, pedagogical and medico-social support of children with infantile cerebral palsy and musculoskeletal disorders will increase the effectiveness of the correctional, educational and rehabilitation process and provide optimal conditions for successful compensation of existing disorders and the subsequent socialization of children of this category.

*The problem of the research* is that, with the existing need for high-quality and timely interaction of specialists in psychological, pedagogical and medico-social support for the development of children with infantile cerebral palsy and disorders of the musculoskeletal system, appropriate methodological materials.

#### **Objectives of the study:**

- organization of effective interaction between participants in the educational process to ensure quality and affordable education for people with cerebral palsy and disorders of the musculoskeletal system;

- generalization and dissemination of the existing positive experience in the work of comprehensive support of children with musculoskeletal disorders;

- providing methodological assistance to educational institutions for organizing inclusive education for students with cerebral palsy and disorders of the musculoskeletal system in the form of conducting master classes, seminars, conferences, consultations, open events, competitions, etc.;

- formation of an information and educational environment that enhances the ability of the subjects of the educational process to gain free access to information, scientific, methodological, material and technical resources in order to effectively achieve their educational outcomes;

- Increase the professional competence of teachers in the issues of new content of education, mastering new forms of work of the teacher with students with disorders of the musculoskeletal system and children with disabilities;

- assistance in the implementation of federal, regional and municipal projects on the problems of inclusive education of trainees with cerebral palsy and disorders of the musculoskeletal system.

The experience of the Volgodonsk Special Boarding School "Voshozhdenie" with children with cerebral palsy and musculoskeletal disorders shows that properly organized complex psychological, pedagogical and medico-social support for children of this category will, if not completely eliminate, significantly weaken the degree of disability children.

As a result of the implementation of the innovative project, the "Model of the Service of complex differentiated correctional-developing and rehabilitation care for children with cerebral palsy and disorders of the musculoskeletal system based on a special correctional boarding school" will be implemented.

Realization of the innovative project will allow to develop:

innovative mechanism of complex differentiated correctional-developing and

rehabilitation care for children with cerebral palsy and disorders of the musculoskeletal system;

- information and methodological data bank that regulates the activities of the Comprehensive Care Service;
- new technologies of correction, rehabilitation and development of students;
- a system of interaction between parents of children with cerebral palsy and disorders of the musculoskeletal system and an educational organization.

As a result of the project implementation the following effects are expected:

- development of educational, correctional and rehabilitation programs of the Integrated Care Service;

- Expanding the range of services provided by the Regional Advisory Center for the provision of methodological, psychological, pedagogical, rehabilitation and counseling assistance to parents (legal representatives) in order to improve the pedagogical competence of parents (legal representatives), raising children with cerebral palsy and disorders of the musculoskeletal system;

- creation of a system of joint approach to solving problems of correction, rehabilitation and development of children with cerebral palsy and disorders of the musculoskeletal system, strengthening their health (physical and mental);

- attraction of additional extra-budgetary funds for the needs of the educational and rehabilitation process of children with cerebral palsy and disorders of the musculoskeletal system;

- strengthening and improving the material and technical base of the educational organization;

-stable attractiveness of the institution for the parental contingent of residents of the Rostov region;

- Increase the competence of pedagogical workers, specialists, parents (legal representatives) in the correction, rehabilitation and development of children with cerebral palsy and disorders of the musculoskeletal system.

## 对当代俄语教学方法中的"倾听"概念 To the concept of "listening" in contemporary methodology of teaching Russian

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文章探讨了现代俄语教学方法中"聆听"概念的特点,提出了一些聆听 类型的分类。 作为研究字典的来源,参考书籍,国内外作者的科学着作被 使用。

关键词: 听力, 听力类型, 听力技巧, 有效沟通, 俄语教学方法。

*Annotation.* The article discusses the features of the concept "listening" in the modern methodology of teaching the Russian language, presents some classifications of types of listening. As sources of research dictionaries, reference books, scientific works of domestic and foreign authors are used.

*Keywords*: listening, types of listening, listening skills, effective communication, methods of teaching Russian.

The relevance of the study of the concept "listening" is due to the fact that modern students do not have well developed listening skills and techniques to work with the text while Federal state educational standard for secondary school (Russian Federation) explicitly states: "*the subject results* of the development of the educational program of basic general education, taking into account the general requirements of the Standard and the specifics of the subjects, included in the subject areas, should provide: 1) improvement of types of speech activity with the help of modern means of communication; 2) mastering different types of listening (with a full understanding of the text, with the allocation of the basic content; with selective extraction of information)» [15: p. 13-15]. Let us turn to the concept of "listening" in the scientific literature.

In domestic and foreign scientific sources the following concepts are used: «auding / audition» and «listening / listening comprehension». Auding (listening comprehension) – is presented as a type of speech activity. Now we will discuss these concepts in more details. According to the *Bol'shoj ehnciklopedicheskij* 

slovar' (1993), edited by A. M. Prokhorov, speech - is one of the types of communicative activity of a person. The communication of members of the language team while using the means of the language is defined as a process (speech activity) and as a *result* (speech works recorded by memory) [12: p. 1123]. In the course of social and historical development - human speech developed in unity with thinking process [13: p. 453]. Interaction between a speaker and a listener defines speech behavior as a "phenomenon of cooperation", coincides with the socio-psychological characteristics of the linguistic personality in the process of communication and is due to: 1) intra-linguistic patterns; 2) external patterns of social and psychological conditions of communication [6: p. 17-50]. The communicative role of the listener is usually considered in the philosophical aspect of epistemology (speech is percepted as a process of cognition) [6: p. 50], the communicative role assumes deductive reasoning [3], and psychological hermeneutics (understanding, interpretation of the text through the culture) [4]. In the Slovar'-spravochnik po metodike russkogo yazyka (1988), edited by M. R. L'vov, listening is defined as "the perception of speech by ear and understanding" [9: p. 22]. In Bol'shoj tolkovyj slovar' russkih sushchestvitel'nyh (2009), edited by L. G. Babenko, the concept of "listening" is defined as listening to spoken texts in the process of training perception and understanding them by ear [2]. The result of listening is a mental processing of information. According to the definition in Novyj slovar' metodicheskih terminov i ponyatij (teoriya i praktika obucheniya yazykam) (2009), edited by Eh. G. Azimov, A. N. Shchukin, auding (listening) - is a semantic perception of oral communication, which is carried out in two directions: 1) perception of the language form; 2) understanding the content of the statement [1: p. 24-25]. Form of implementation: verbal understanding (due to speech experience) and *subject understanding* (based on the life experience of the listener) [1: p. 24]. Understanding of speech includes the following processes:

1) <u>Attitude of a student</u>: setting the type of listening, the presence of motive (motivation), interest in receiving information or the need to solve the communicative task;

2) <u>Comprehension, awareness</u>: the process of establishing semantic relations between units of speech communication in the communication process;

3) <u>Clarification of concepts</u>: work with the meaning of the words.

The levels of speech: motivational, formative, implementing [8].

In the scientific literature the terms auding / audition are used as synonyms of listening comprehension. In the dictionary-reference book *Pedagogicheskoe rechevedenie* (1998), edited by T. A. Ladyzhenskaya, A. K. Mihal'skaya, the following definition is given: *listening (auding)* is "a receptive type of speech activity aimed at the semantic perception of sounding texts". Setting for hearing, orientation to a certain type of listening gives a *communicative intention* [11: p. 217]. Active

mental processes are laid to the basis of listening (auditory memory, prediction of the content of the statement, the allocation of semantic key points in the text, etc.). The result of listening - is understanding. The listener perceives the information and produces semantic processing of the sounding text [16: p. 543-544]. In the textbook Russkij yazyk i kul'tura rechi, authors: L. A. Vvedenskaya, L. G. Pavlova, E. Yu. Kataeva, (2005), speech communication is presented as a process in which the will, emotions, life experience, knowledge, memory of the speaker and listener are involved. An important role in speech communication has a speech situation [5: p. 165-177]. In the dictionary-reference book Ehffektivnoe rechevoe obshchenie (bazovye kompetencii), edited by A. P. Skovorodnikov, the term "culture of listening " is used. The culture of listening — is the ability to physically perceive the sounding word; the ability to focus and comprehend the sounding text [17: p. 277]. The culture of listening is understood as: 1) setting for understanding, determined by the situation of communication, goals and objectives; 2) serves as a mutual understanding, the desire to understand the true intention, the ability to perceive the new, to prevent conflicts, to overcome barriers in communication, to eliminate stereotypical dogmatic thinking, bias to the content, etc. [17: p. 278]. The culture of listening is defined as a component of a person's general culture, intelligence and upbringing.

Thus, in the scientific literature, listening is defined as the process of conscious action, the ability to understand and identify what is heard, which is associated with the motivational orientation of the individual, self-control skills, good manners, politeness, education. Listening is always associated with understanding of the text and context, as well as with the mental processes of auditory reception, perception, interpretation, reaction to what is heard. Skills of active and effective listening should be developed in close connection with language and spelling skills. Different approaches and criteria are used to classify types of listening (auding). Some classifications of listening types are presented below.

<b>3</b>	
T. A. Ladyzhenskaya	Based on the type of installation of semantic perception of the text: <i>global listening</i> (the perception of the text as a whole), <i>detailed listening</i> (perception of basic semantic units of the text: a) presentation; b) paraphrase, c) discussion, debate); <i>critical listening</i> (critical thinking, expression of the students' own point of view, argumentation) [10: p. 268-270].
V. V. Safonova	argumentation) [10: p. 268-270]. Based on the principle of priority of problem-search forms of work in the communicative and cognitive activities of students: <i>culture-oriented listening</i> (individual's activity in the language, multicultural and/or virtual environment) [14: p. 16].

Table 1. The classifications of types of listening

	In the methodology of teaching Russian the following types of listening are allocated for training: global, detailed, critical, non-critical, reflexive, non-reflexive. In accordance with the purpose and features of the text,
L. N. V'yushkova	three types of listening are presented: <i>informative listening</i> (understanding other people's thoughts); <i>emotional / empathic listening</i> (understanding the feelings of the speaker, motivation), there are three main goals of emotional listening: a) to show the diversity of human feelings, b) to learn how to relate the manifestation of feelings with the situation of communication, c) to educate how to "hear" another person; <i>instructional listening</i> (the
	transformation of information into action) [7: p. 10-11].

Based on the analysis of the Federal state educational standard for secondary school and scientific literature, the following conclusions can be drawn: *auding (listening comprehension)* – is an active mental process, one of the types of speech activity, interconnected with other activities and *the personal results* of students; listening is the key to effective communication, can be carried out with the use of information and communication technologies; this is the ability to perceive, understand, recognize and interpret the sounding text, the ability to communicate and cooperate in the process of educational, pedagogical, research, creative and other activities.

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由地缘政治,社会文化,国际和国家因素限制的高等教育体系运作的当前条件迫切需要改变管理其发展的方式。对现代管理概念的分析使得有可能确定需要发展管理高等教育的新机制,同时考虑到坐标和管理向量的变化。 笔者提出了信息 - 认知管理机制,能够分析高等教育管理体制在转型条件下 实施管理所产生的多维关系和因素。

关键词: 高等教育, 管理, 管理主义, 斯泰克曼斯基方法, 认知, 信息 社会, 信息认知管理。

Annotation. The current conditions for the functioning of the higher education system, conditioned by geopolitical, sociocultural, international and national factors, urgently require a change in the approach to managing its development. Analysis of modern management concepts has made it possible to identify the need to develop new mechanisms for managing higher education, taking into account the change in coordinates and management vectors. The author proposes a mechanism of information-cognitive management capable of providing an analysis of multidimensional relationships and factors that arise when implementing the management of the higher education system under the conditions of its transformation.

*Keywords*: higher education, management, managerialism, stekholdersky approach, cognition, information society, information-cognitive management.

Currently, many foreign, and especially European, higher education systems are undergoing a modernization stage, caused by attempts to unify educational systems during the adoption of the Bologna agreement and the geopolitical crisis that has aggravated many social problems. Market orientation, the positioning of education as a service, and the educational institution as a typical organization providing services, largely determine the approaches to managing higher education institutions and the perception of the system as a separate manufacturing industry [1, 2]. Researchers distinguish new socio-economic features of the system of higher education: the stakeholder approach; accentuation of inquiries, abilities and possibilities of the consumer of educational services, first of all, the student; academic stratification, consolidation of system-forming educational organizations; the growth of the role of information and knowledge, both in the functioning of the higher education system and in its management [3, 4].

The emerging unification of the country's higher education systems means not only a decline in the "academicism of education", but also the transformation of the system as a whole: the desire for a balance of powers "federal center-region", "state-public" (management and control), " state-private" (financing), "academic-applied" (the direction of teaching); massivization and, as a consequence, a decline in the quality of education as a whole (since the lower levels can not master complex educational programs, there are language barriers, etc.); resolution of the problem of accessibility of education (formation of the system of state order and distribution of graduates, student loans, educational grants, etc.). According to the study of the European Commission TEMPUS in the field of higher education management in the participating countries, the main difficulty in increasing the effectiveness of the management of education is the "underdevelopment of governance structures", which refers to "the composition, mode of operation, culture, understanding of the role and authority of government bodies" [5].

So, the management of the development of higher education requires a serious modification and must be built on the synthesis of national educational traditions, and international progressive experience, management theory and practice, which are effectively implemented through the concept of new managerialism. Its essence lies in the transformation of management activities, the acquisition of new functions capable of supporting educational organizations and ensuring their improvement, reducing the moral risks of education, the risks of controlling education, financial costs, autonomization and collegiality of education. From the positions of the educational organization (the level of higher education), "growth in profitability and satisfaction with expectations," mean the competitive positioning of the educational organization in the market of educational services, determined primarily by the quality of products - the quality of graduates, and also the satisfaction of the needs of the stakeholders of education - the student, the society, state, employers, employees of the educational organization.

In general, the management framework emerging in the new conditions of the functioning of higher education is extremely mobile and dynamic, but always preserves the outer contour and specific features of multidimensional interactions between the learner, the teacher and the educational environment. Indeed, from the standpoint of each higher education stakeholder, a particular management object is a priority, and the effectiveness of the system as a whole is determined by the following factors: the implementation of the rights of stakeholders to manage; optimization of conditions for the implementation of educational activities (normative, information, material resources); the achievement of a balance of their interests (a zone of tolerance); meeting expectations.

Obviously, it is necessary to have a basis that satisfies and integrates the requirements and expectations of all interested groups, the mechanisms of competitiveness of all educational systems. It seems that the quality of education as a set of properties and effectiveness of the system can act as a "clamp" that allows integrating the interests of all education agents. The concept of quality includes: compliance with the standard, compliance with the application, conformity of value, compliance with hidden (potential) needs.

This presentation of the objectives of the functioning of the higher education system assumes the implementation of TQM (Total Quality Management), defined as a "transparent" approach to management, in which the contribution received by each employee is exhaustively used and implemented in the matter of continuous improvement of everything related to meeting the requirements of the stakeholders . The application of this ideology to the improvement of the quality of higher education also determines the vector of its development - the continuous improvement of the quality of education in accordance with its requirements of the educational standard [6].

The priority of this vision is determined by the solution of the following questions:

1) evaluation of the effectiveness of higher education management (at the level of educational organizations and the system as a whole) is conducted through monitoring of interacting processes, which greatly simplifies the diagnostic mechanism;

2) the evaluation of management effectiveness is carried out "here and now", there is no delayed evaluation effect, which allows, if necessary, to adjust the control actions. This position is of high importance for higher education, the functioning of which is subject to high variability in the conditions of the external and internal environment;

3) the search for criteria of management effectiveness is significantly simplified - they are the quality indicators of each of the processes, due to the implementation of the quality management system of educational organizations.

Implementation of this approach at the technological level is associated with certain difficulties, primarily with the processing of dynamic information flows, obtaining feedback about the state of the system in the course of its functioning, and the realizations of all types of management-institutional management, management of the structure, the structure of the educational organization, and pedagogical management.

The way of overcoming the information barrier and transforming data for managing the functioning and development of the higher education system in the context of continuous quality improvement is seen in the application of information-cognitive management based on knowledge, the process of their "extraction," interpretation and creation of new knowledge necessary for identifying and solving problems of social organization. Integration of information and cognition is determined by the decision-making cycle (chain) of management "data - information - knowledge - patterns - search for development paths - management decisions" [7].

Especially important in this context is the very ambiguity of "cognition" in the management of higher education: knowledge of the ways and patterns of the functioning of the system itself, its elements (educational organizations) narratives; "Knowledge" of the educational organization itself, determined by its traditions, place and role in the education system of the country, region, city; "Knowledge" as an educational resource of the organization, including subject, social, pedagogical directions, etc. Narratives that are significant for the management of the educational system, carry the basic laws of its functioning and the requirements for effectiveness, contributing to the formation of a management system in each educational organization. Organizational knowledge, defined within the system at any particular moment in time, is subject to changes in the variability of educational processes (external or internal), creating new ways of solving management problems.

The implementation of information-cognitive management of the higher education system is seen in the following sequence of steps:

- isolation of the educational system (structure, process), specification of its research level and type of management, determination of internal and external characteristics (influences), the functional of the system within the framework of the strategy for reforming and developing education;

- the definition of information sources for analyzing the states of the higher education system on the basis of their information potential;

- cognitive analysis of educational activity, identification of characteristic features, grouping;

- formalization of input, output parameters, educational outcomes, stakeholder characteristics, the prevailing factor is the characteristics of the learner and the resources of educational activity within the framework of the educational organization in question;

- the establishment of information flows, vector links within the educational system that describe the philosophical, psychological, pedagogical, organizational, social and other patterns of educational activity-obtaining cognitive ideas about the system;

- the development of a dynamic model of the higher education system through the methodology of information-cognitive modeling, which allows: formalizing

all the processes of the system; receive timely information on the status of each element of the system based on the results of its activities; identify the criteria and boundaries of management; to forecast development at all levels of system management. Information and cognitive modeling of higher education is able to take into account the dynamics of the development of the system's subjects on the basis of the description of the diverse information external and internal links, the possible state and behavior, taking into account the freedom of decision-making by the subjects of the system (positive or negative effect of managerial influences at all levels of the educational system).

So, the implementation of the ideas of the concept of managerialism and the concept of total quality management applied to the management of the higher education system led to the search for a mechanism that can support the adoption of managerial decisions. Knowledge of the laws of educational activities and their specificity with respect to each educational organization we are attached, as it is an asset - a set of theoretical models of management, practical experience, and used the backup of information technology, and innovation. Information and management of cognitive development of higher education will not only be structured pedagogical information flows, providing all the necessary properties of the information, but also to implement their interpretation, to gain new knowledge for the management of the educational system and reducing its entropy.

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# 为自闭症儿童准备上学的心理和教学支持

# Psychological and pedagogical support of a child with autistic disorder in preparation for school

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在这篇文章中,考虑了为自闭症谱系障碍儿童(ASD)的学校学习做好 准备的紧迫性问题。 根据联邦国家初等教育普及教育标准,提出了一个 用于为学校准备ASD儿童的附加总体综合发展计划,并披露了其实施阶段。 文章揭示了教师和家长在准备ASD儿童教育方面面临的问题以及解决问题的 方法。

关键词: 自闭症谱系障碍, 纠正, 社会化, 为学校做好准备。

Annotation. In the article the question of the urgency of the preparation for school of children with autism spectrum disorders (ASD) is considered. An additional general general developmental program for the preparation of children with ASD for school is proposed, based on the federal state educational standard of primary general education, and the stages of its implementation are disclosed. The article reveals the problems faced by teachers and parents in preparing for the child's education with ASD and ways to address them.

*Keywords:* autism spectrum disorder, correction, socialization, preparation for school.

A child with disabilities in development needs support, acceptance and understanding from others. The problem of teaching children with autism spectrum disorders (ASD) remains relevant today, most vividly manifested during the beginning of schooling. Unlike the Federal State Educational Standard (FSES), designed for children with various abnormalities and irregularities, the standard for children with ASD does not rely on the experience of the state education system [1]. There is no such experience. There are non-state educational structures and public organizations that develop and implement educational programs for children with ASD for their institutions. In this regard, it seems relevant to develop a system of comprehensive psychological and pedagogical support for children with ASD to prepare for school for educational and social institutions [2, 3].

In The Scientific and Practical Center for Rehabilitation of Children "Correction and Development", an additional general general developmental program for the preparation of children with ASD for school was developed with the support of the federal state educational standard for primary general education (FSES PGE). The group was completed in accordance with version 8.2, where the academic component predominates. In the program, two stages were identified: the stage of preparation and the implementation phase.

**The first stage includes several items:** I. Training of specialists in psychological and pedagogical support of children with ASD; II. Interaction with parents; III. Establishing contact with the child with ASD; IV. Complex diagnostics; V. Organization of space for a group of children with ASD: 1. Zone for individual classes; 2. Zone for group lessons; 3. Zone for sensory discharge; 4. Teacher's Work Area.

The second stage includes: I. Receptions of reinforcement of motivation for learning, reinforcement to desired behavior: - concrete method; assessment of the achievement of sensory reinforcement (hug, pat on the head); social reinforcement, for example, praise, "well done"; encouraging incentives; diverse, rapidly changing methods of work; II. Visual support; III.Development of the adapted educational program; IV. Tutoring; V. Prevention of undesirable behavior; VI. Interaction with parents is the primary and primary point of training; VII.Individualny work with a psychologist.

The family often needs more support than the child himself, as they experience a number of significant difficulties in the interaction. There are often cases when parents are not ready to adequately accept the problem of their child and then they try to avoid discussing the existing difficulties. The presentation of inflated demands on the child often exacerbates the problem and only after understanding the mechanism of violation in autism, the specifics of the manifestations, many parents build their relationships with their own child in a new way. Positive changes in its development give them confidence. In the future such parents maintain close contact with specialists who work with their child.

In this regard, the beginning of the child's education with ASD in the school is an important stage in the process of its socialization. A child with autism has special educational needs. Allocate needs, the satisfaction of which is ensured by the very introduction of the child into the learning situation. These are the needs associated with difficulties in mastering the school life schedule and the primary organization of the learning process, as well as with the need for urgent assistance in developing simple household skills and communication methods, the needs, the satisfaction of which supports the development of the program in the school education. These needs are constant and are associated with control and special pedagogical and psychological assistance to the child in mastering various subject areas.

Needs associated with significant problems of affective and emotional-personal development of the child require his constant involvement in jointly meaningful and jointly-separated activities on the basis of using all the capabilities of the child to create emotional comfort. It takes daily work to establish and develop emotional contact to involve the child in the joint allocation of individual impressions and the evaluation of the impressions received. Involvement in a joint experience and jointly meaningful interaction is the key educational need of all children with ASD. To begin with, it is very important to create a psychologically comfortable environment, to form a trusting relationship with the child, to reveal his attachments, interests, to find out what makes him happy, what he is afraid of. These features are important because any change in the habitual rhythm or situation can cause the child to have aggression or autoaggression (self-harm), an increase in stereotypes. The introduction of the child into the collective of children in some cases also requires the preliminary preparation of both the child himself and the children with whom he is to contact. Any achievement of a child in the sphere of social interaction requires transfer and consolidation in other situations. The main thing is for the child to realize the importance of the activity, to which his specialist urges him.

Corrective work with an autistic child requires a special approach, the implementation of which is impossible without special training. For this reason, the use of conventional methods, as well as special techniques for children with other disorders, is unacceptable. The prognosis of development of children with autism spectrum disorder is determined by biological and social factors. In time, the begun corrective work with the participation of parents gives more chances for successful social adaptation of the child. This work requires pedagogical skill, flexibility in the application of various methods, creative approach, large expenditure of mental and physical energy. Only after understanding the child with his feelings and feelings, the teacher becomes his friend, helps to get rid of complexes, to find a common language with the surrounding world and people. With such a teacher, the child gradually becomes aware of his individuality and significance. The child achieves greater stability in the emotional sphere. Adequately responds to the praise of adults, he develops the desire for contact. He gradually realizes that everything that happens with him also has significance for other people. In case of a failure in training, a child shows less and less negative reaction, he acquires resistance to his own mistakes and mistakes, he retains motivation to achieve the goal.

In the current academic year, 10 children were trained, who, in addition to intellectual disabilities, had autism spectrum disorders. Comprehensive accompa-

niment of children with ASD was carried out from the moment the child entered the training. Specialists-educators-psychologists, teachers-defectologists, teachers-speech therapists jointly developed an individual development route for each child. The content of the work at a particular stage depends on the characteristics of the child's ASD, on the level of social skills, communicative functions, and on the rehabilitation potential of the family.

Realization of the experimental program in the scientific and practical center "Correction and Development" showed that the optimal number of children in the classroom should not exceed 4-5 people. Frequent forms of maladaptive behaviors are avoidance and autostimulation-tearing off of tetrad sheets, painting of text or illustrations in the performance of a task, or simply spontaneous drawing of scrawl. To prevent affective undesirable reactions, during the adaptation period the child needs to be given a place where he could retire at a certain point in time - to close himself from everyone. This place is a small space separated from the rest of the class, where a child during a lesson can hide at any time for a while. To prevent unwanted behavior in the lesson, it is necessary to offer alternative behavior step by step. Visual support of the child through drawings, symbols, diagrams, photographs, pictograms is the main link in overcoming difficulties in learning. The formation of a stereotype of educational behavior is facilitated by the token method and the method of positive reinforcement.

These features of training contribute to the fact that a child with ASD begins to form and develop a sensual and social experience.

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# 在中国媒体中设计俄罗斯形象 Designing the image of Russia in the Chinese media

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文章描述了俄罗斯在中国媒体中的形象塑造。 透露了国家在现代国际 关系体系中的形象的作用。 作者指出,中国媒体设计的俄罗斯形象直接取 决于地缘政治和经济形势。

关键词: 大众传媒; 俄罗斯与中国的关系;关系; 合作。

Annotation. The article describes the construction of the image of Russia in the Chinese media. The role of the image of the country in the system of modern international relations is revealed. The authors note that the image of Russia, designed by the Chinese media, directly depends on the geopolitical and economic situation.

*Keywords:* mass media; relations between Russia and China; relations; cooperation.

In the modern information society, the mass media are an integral part. Undoubtedly, on the nature of the coverage in them of significant phenomena occurring in the world; accents on facts, images, leaders; intonation and emotional coloring of events, the further development of society largely depends.

In connection with the increasing role of the media in the modern world and their influence on the country's position in the international space, the study of Russia's image, its political life and the image of Russian politicians in the media is of special interest.

The history of the relationship between Russia and China dates back to the 17th century, and interest in the 5 representations of Russia's image in the Chinese media began to appear around the 1990s.

In modern realities, Russian-Chinese relations are on the rise, there is a ten-

dency to turn our country's foreign policy toward the East. This fact actualizes the study of the image of Russia, which is formed in the Chinese media, as the positive image of the country is an important factor in the development of bilateral relations.

From the adequacy and objectivity of media coverage of significant events taking place in the world (including in the sphere of politics), the future development of society largely depends.

In modern science, there are different approaches to the notion of "image." As a basic for our research, we will use the definition of O.I. Kalinin who believes that the term "image" should be understood as spontaneously formed representations that have emerged as a result of the interaction of people in different countries [1, p.99]. The first attempt at a dialogue in the media between Russia and the PRC was made in the middle of the XIX century, when Russia and China released a joint experimental newspaper "Friend Manchur" [2].

To date, all kinds of mass media are booming in China: more than 2,000 news-papers are published, as well as over 8,000 periodicals [3, p.144].

To study the image of Russia in China, we selected the newspaper "Renmin Ribao" as one of the leading Chinese newspapers, which is freely available to Russian readers.

All headlines for 2010, 2012, 2014, and 2016 were reviewed, reflecting the most vivid political events of the time directly related to Russia and international relations, of which 57 articles were selected for analysis. The criterion for selecting articles for traditional analysis was the presence of semantic units in the headings of articles reflecting the political themes of modern Russia, as well as the presence of specific words, ideas and characters relating to Russia's political life.

Based on the results of the traditional data analysis, the following conclusions can be drawn:

1) The most vivid and discussed topics for 2010 were issues of international strategic cooperation between Russia and China, the "aggressive" foreign policy of the Russian state both in relation to both the West and the East; the problem of reducing the level of public confidence in Russian politicians, as well as the problem of cooperation between Russia and the European Union, in particular the EU's refusal to abolish visa-free regime.

2) The articles for 2012 mainly reflect the events of the political settlement of the military conflict in Syria, the military-technical development of Russia, the prospects for mutually beneficial cooperation between Russia and China and India.

It should be noted that in the articles of 2010, the Sino-Russian relations were subject to more discussion than in the publications for 2012. In general, it can be said that Russia and the Russian government in this newspaper appear to be in a

positive light, there is no sharp criticism of the actions and policies pursued by the authors of the publications. Newspaper articles contain a description of real events, without "exacerbating" the negative attitude of readers and the general public.

3) The most discussed topics in the newspaper "Renmin Ribao" for the year 2014 were questions relating to sanctions imposed on Russia by Western countries, as well as counter-sanctions, gas and other agreements between Russia and the PRC, a reversal of the "southern stream" towards Turkey, the relationship between Russia and NATO, aspects of a possible softening of the situation in Syria.

4) In 2016, the publications of the newspaper "Renmin Ribao" dominated the themes of the relationship between Russia and the United States (especially after the election of the new president), Russia's role in the settlement of the conflict and the stabilization of the situation in Syria, as well as the complicated relationships between Russia and Ukraine, Russia and Japan, to discuss the current problem of state control of rising food prices in Russia, as well as the theme of Moscow's "strategy" aimed at increasing the information impact on the world.

An analysis of the published articles showed that Russia and the Russian government in this newspaper appear to be in a positive light, there is no sharp criticism of the actions and policies pursued by the authors of the publications. Newspaper articles contain a description of real events, without "exacerbating" the negative sentiment among readers and the general public.

Thus, in one of the leading periodicals, Russia is presented in a positive light: as a state that provides humanitarian support to countries in need and takes an active part in resolving pressing international problems and conflicts; as a country ready to come to the rescue, as a state seeking to expand cooperation with other countries. Practically in every article that touches on political issues, Russia is covered as a country with an active foreign policy stance, striving to achieve the international order and as a strong, powerful country, ready to do everything for the sake of achieving its goals.

In general, it should be noted that in recent years the problem of understanding the image of Russia in the Chinese media has occupied the minds of many Sinologists. In particular, S.L. Tikhvinsky [4, p.45] wrote a whole research paper on how the image of Russia in China is perceived. Representations of the Chinese about the Russians are presented in the works of NV Ten, who in her study noted that in the Chinese media, on the whole, the positive image of Russia is represented. However, some questions concerning Russian domestic policy are criticized. For example, criticized the federalization of the early 90's. XX century [4, p.69-76].

If we talk about the attitude of the Chinese media to joining the Crimea by holding a referendum in 2014, it is rather neutral. The Chinese authorities also do not take an active position on this issue, but the press indirectly form a positive

opinion on these events. The news about the accession of the Crimea to Russia was submitted taking into account the points of view of all interested parties. In this connection, it is impossible not to agree with O.I. Kalinin, that the image of Russia in the PRC media is fairly neutral and all "materials are only informative" [1, p.99].

The problem of the image of Russia in the Chinese media is a subject of study of domestic researchers. So, NI Shishkin in the article "Russia in the headlines of the Chinese media" concludes that during the year 2015, interest in Russia in the press was at the same level until December. Interest in Russia in the Chinese media has increased tens of times, when the Russian-Turkish conflict broke out. China actively observed the unfolding sanctions war. In all the materials of this period, there is some caution in relation to how the Russian-Turkish relations will develop [6]. In general, N.I. Shishkina concludes that in the Chinese media, Russia looks like a weak country, dependent on cooperation with China and unable to come out without its help from the crisis, which makes cooperation profitable for China.

The analysis allows us to state that the nature of media publications in China is a reflection of the official position of the authorities. We can say that the materials about Russia are episodic, but if you compare the references to Russia with references to other countries of the world, then certainly there are more mentions of Russia. This is also proved by the research conducted by I.V. Stavrov, who notes that references to Russia, in particular, to the newspaper "Heilongjiang Daily", are found six times in December 2016, four times about the USA, two times about the EU countries, about the DPRK only once [7, p.56].

In the Chinese press, there is practically no information about Russia itself, mainly information is provided on the development, for example, of transport infrastructure in the border areas with China, and information about similar Russian projects is not provided.

Consequently, the image of our country is not very pronounced, but, on the contrary, more calm, rather neutral. Sometimes internal problems of Russia are touched upon, which are also informative (it is almost impossible to meet positive or negative assessments). It seems that this is because the PRC authorities and the mass media controlled by them do not want to develop the discussions because of their mentality, and also afraid to spoil the Russian-Chinese relations, which are at their peak of development.

The Chinese media have information that does not give a high appreciation of Russian art culture, but says that cultural activities in the sphere of bilateral relations will, in particular, "increase the level of training of talented artists in China" [8]. It can be considered that in this case an indirect positive assessment of Russian culture is given by highlighting the advantages.

In turn, Russians believe that Russia and the countries of Asia share common

political and economic interests.

According to the results of the sociological survey "Turning to the East: seriously? and ... for a long time ?! "[9] conducted by VTsIOM on December 14, 2015, the overwhelming majority of respondents (70%) are confident that a kind of" turn to the East "will change the life of Russians in a positive way due to the strengthening of trade and economic ties, that will lead to the emergence of new goods and services, increase the development of the economy in our country, will help to overcome the crisis. That is why every fifth citizen of our country believes that it is necessary to move more actively towards a "new eastern policy". This "turn" is beneficial not only for Russia, but also for the eastern states.

To trace the dynamics of Russian-Chinese relations, according to Russians, it is possible in Table 1.

Table 1. Distribution of answers to the question: "How do you generally<br/>feel about China now?" [10].

How do you generally feel about China now?	II. 2011	III. 2013	XI. 2013	V. 2014	XI. 2014	I. 2015	IX. 2015	I. 2016	III. 2016
Good	63	63	55	77	75	81	72	72	67
Bad	24	24	31	8	13	8	14	13	16
Difficult to answer	13	13	14	15	13	11	15	16	17

According to the data presented in the table against the backdrop of a flurry of international sanctions that Moscow has been ravaging in recent years, China is the "rescue aid" for Russia, the level of confidence in which has been high for several years already.

The results of the survey "Russia-China: from Enmity and Competition to Friendship and Cooperation" [11], conducted by the All-Russian Public Opinion Research Center on November 6, 2014, show that China for Russia is primarily a strategic and economic partner (49%), Russian-Chinese relations seem to be mutually beneficial for 60% of respondents (in 2009, 37% thought so). 36% of respondents perceive China as a friendly state of Russia. They see him as a competitor and probable adversary only 8% and 1% of our fellow citizens, respectively.

The results of Levada Center research show that, in general, the attitude towards China remains positive in 2018 as well. So, according to the results of the poll conducted in January 2018, 9% noted "good" and 61% "mostly good" refer to China [12].

From the data presented above it follows that both countries understand the importance of demonstrating to the world strong relations that are calculated for centuries. Russia and China closely cooperate in the sphere of foreign policy and

security, the countries have a single approach to a wide range of world and regional problems. However, foreign policy considerations continue to be central to Moscow's relations with Beijing.

Consequently, the image of Russia in the Chinese media can be considered neutral: information about our country is infrequent, but, moreover, much more often than information about other countries. The publications contain materials about our country that indirectly form its positive image as a country with a high level of culture, and also draws unobtrusive attention to the economic problems of our country. Therefore, it can be concluded that, due to its national characteristics, the PRC does not express open support for Russia, but uses the media to indirectly form a positive attitude towards the image of Russia.

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## Reinfeld大厦的建筑分析 Architectural analysis of Reinfeld's mansion

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这篇文章描述了二十世纪下半叶在叶卡捷琳堡建造的豪宅的历史。 受审查的建筑物由于其建设性特征而能够在其存在的150年中生存下来,因而受到关注。 今天的这座豪宅以其自然不变的外观吸引了路人的城市形象。 文章中给出的各种图表足以说明建筑师在设计和建造能够获得"不朽"的 建筑物方面的主导地位的重要性。

关键词:历史,叶卡捷琳堡,建筑,Reinfeld,修复

Abstract. The article describes the history of the mansion constructed in Ekaterinburg in the second half of the XXth century. The building under review is of interest because of its ability to survive during 150 years of its existence due to its constructive characteristics. The mansion today contributes to the urban image of streets attracting passers-by by its natural unchanged look. Various graphs given in the article illustrate well enough the importance of the leading place of an architect's contribute in designing and erecting a building that can get the "immortality" or not.

Keywords: history, Ekaterinburg, architecture, Reinfeld, restoration

The city, where you can see together the historical and cultural monuments, is the best example of organic to urban environment architecture.

Ekaterinburg is the city where modern and historical architecture coexist in harmony. It is possible to see old lonely mansion at the foot of ultramodern skyscraper during a walk through the city. Most of those «architectural monuments» wait for restoration, at least to ensure consistency with unfeatured note about its historical role. However, not every historical building have the same fate. More often mansions become the rigors of the needs of modern city. For example, if they are located in that streets, where the need of new business center displace a wish to give voice to descendants of the former appearance of the streets. Most of long-live mansions are generally located collectively on the low-rise streets like Rosa Luxemburg and Karl Marks streets (Zlatoustovskaya and Krestovozdvizhenskaya str. before the 1917 revolution).

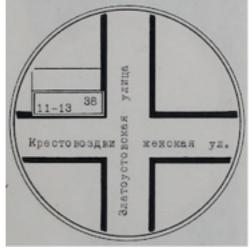


Figure 1. Photo from «Alphabet of Ekaterinburg» [5].

This article is devoted to the history of mansion erected in Greek-Byzantine style on a cross of Rosa Luxemburg and Karl Marks streets. During its existence this mansion passed through innumerable count of housemates and owners and have kept natural unchanged appearance. Having been built as a mansion (for well-off section of the society needs) and housing restaurant today the building met challenging XX century – a period of time when it had to meet needs in stark contrast to primary.

«In the latter half of the XIX century many streets of the left bank of Iset, and among them Krestovozdvizhenskaya str., became more popular place for new houses construction and were very attractive for architects. Building with colourful eclectic and modern outside ornament have saved most of Ekaterinburg's architects idioms, from famous architects to design-engineers» [1]. From earliest years the mansion with double address (Zlatoustovskaya, 38/Krestovozdvizhenskaya, 13) have been showing its stability to tests of time. With the first notes about that building in historical records (1889) there was mentioned about Konstantine Reinfeld (whose years of life are unknown) – noblemen, thus he can pass for one of the fist mansion's owner [2]. Also, in Ekaterinburg's directory are mentions about Reinfeld's wife – Louise Reinfeld – noblewoman, who had an estate with address Krestovozdvizhenskaya, 8-10 that is the shining example of Ekaterinburg's mansion with eclectic motives of XIX century, there was territorial receiving room not far from mansion of K. Reinfeld [1;2]. Both mansions are appeared in guides

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of architectural monuments, but estate on Krestovozdvizhenskaya, 8 str. have approximate date of construction and names of suppose architects (1860s, M. L. Reutov and E. M. Kosakow) against to K. Reinfeld's mansion, only approximate date of construction "the second half of XIX century" has kept. [1;3;4]. Both mansion ware erected at the same style and at the same time, thus M. Reutov and/or E. Kosakow are able to be authors of mansion with double address.

Since 1882 K. Reinfeld used the estate as pharmacy: «New chemist shop was opened by me not far from bridge "Splavniy" in my own dwelling. Pharmacist K. Reinfeld is the store keeper...» [5]. At that point, the mansion hasn't been only manor estate – there was organized the space for pharmacist's activity. The then-widespread square form double-storey construction with stone annex alloyed detach space for chemist store from private space, thus neither disturb each other.



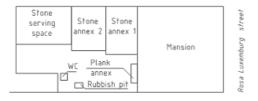
Figure 2. Pharmacy building 1920-30.

Notes about period of K. Reinfeld's mansion ownership weren't saved in archival documents. The next records by 1925 are about period of estate's life as a communal house. It appears probable that noblemen's living and working space came into possession of state agency officials after 1917 revolution. Also, the names of the streets where mansion located have changed: "Zlatoustovskaya" became Rosa Luxemburg street and "Krestovozdvizhenskaya" became Karl Marks street. So, memorial tablet with Karl Marks are saved on one of mansion's photos of the 1920s (Fig. 3).



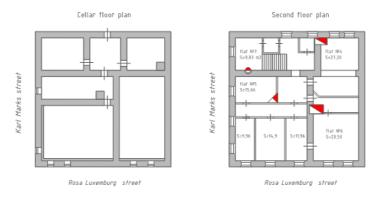
#### Figure 3. Face of the building by Karl Marks street (the last half of XX)

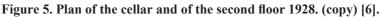
The first full-fledged drawing of mansion with double address was saved in archive documents of the 1928 with in considerable detail area plan (Fig. 5), that give a shape of original planning (spacious rooms and corridors with brickwalls) and plan after the reconstruction (supposedly the wooden "partitions" forming the small rooms and narrow corridors) (Fig. 6,7). According to drawings the estate consist of the square form double-storey construction with two stone annexes, one of which was the kitchen, and another one was the living accommodation, stone serving space – the woodshed and plank annex (351,03 m<sup>2</sup> for the most part). So, there in the plan were toilet and rubbish pit - things no longer extant (in the backyard of 117,22 m<sup>2</sup>). Spacious rooms of the nobility's estate allowed to divide available space into accommodations of any necessary area - the bigger family the greater room. Thus, form of the interior space was changed. With changes of mansion's status, the number of accommodations has almost doubled (10 spacious rooms and 2 wide corridors was split into 14 rooms and 7 corridors). After reconstruction room's area varied between 9,83 and 52,21 m<sup>2</sup> (flat №5 consisted of 4 rooms and corridor 8 meters long), kitchen of 21,12 m<sup>2</sup> and woodshed of 47 m<sup>2</sup> accommodate amount of occupants exceed the number of housemates for which the estate was constructed.

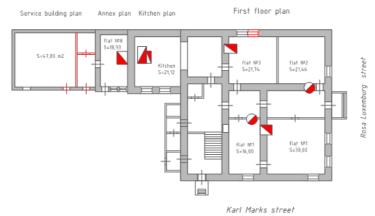


Karl Marks street











Formation a separate space by erecting the new walls turned out insufficient for creation of comfortable conditions for new owners in accordance with the requirements that was applicable to this house. With the mansion's plans there exists complaint by tenant from flat №3 about light transmissibility of the window. In the year of making an application (in 1928) the trouble was obviated. Light surface was run up to standard, but after bidder's departure window was restored [6]. Also, at some time the central entrance by Rosa Luxemburg street was deconstruct for some reason [3]. It is unknown for how long the estate have been the communal house.



Figure 7. Restaurant [7].



Figure 8. The restaurant's interior [7].

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Antique detached house with archaic interior - the new chapter at mansion's life since 2009 as a "meal house" (Fig. 7,8). New owner's interest in opening restaurant at the estate of century before last is the essential role in its life. Faces of the building are performed in classic architecture style and attract as passers-by as businessmen. New owners gave to the mansion new lease of life. The building needed capital repair. Not only the location in the city center but also low building dilapidation and outside decoration were the winning arguments in choosing this variant for restaurant. Brickwalls were popular at construction of the last half of XIX century and have significant advantages over wooden. Bricks construction allowed high resistance to effort of time effect and less reconstructive investment and work. Building had been need of monumental works in as reconstruction of walls as shoring of foundation. Outside of capital repair of farming, new owners have changed the planning to the original, according to drawings due to communal planning's dissatisfaction and the requirements of the restaurant. According to remaining photos there was working at faces of the building; walls were plastered, main entrance and fretwork were restored - previous view was returned.

The architect's high-priority problems at the beginning of heavy or small-size erecting are the search for a compromise between building's appearance in a particular urban setting and requirements of the customer, and the design of the facility with solid and aesthetic value thus it can go through the time. Constructing the mansion at that time was an erecting a solid building with long-term service. Building site at the erecting period of time was located near city center that affected its architecture:

• structural concept which allowed not only to survive more than century and be extant but also be arranged under spirit of the time and tenant needs by virtue of flexibility space of ample rooms;

• outlook that are in harmony with nearby streets and able to stop a passer's-by clock.

From spacious estate with wide stone services to restaurant in the center of modern city though a long period of time – nowadays we are confronted with double-storey house of bricks faces of which are performed in several eclectic streams ("the Greek Revival", "Russian-Byzantine" and others), edges of which are framed with "beveled" stone from bellow and "wide pilasters with corrugation, glib base and glib top without head of a column" from above. Front of the building are completed with complex attic [3]. Whereas reconstruction there is impossible to see the mansion on its primitive form due to deconstruction of stone and plank annexes. Also, the attic wasn't restored (its left part got out of shape (Fig. 9)), but that architectural monuments as the sound participant at conceptual city design will long be example of combination between modern and historical architecture.



Figure 9. Attic

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## 在k-ary GCD算法的一个加速度上 On one acceleration of the k-ary GCD algorithm

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本文考虑了基于k-ary算法加速计算给定A和B的自然数的最大公约数GCD 的方法之一。 例如,在密码学和数论(见[1])中实现了许多数学和数论 算法时就会出现这样的问题。

关键词:最大公约数,二进制算法,K进制算法,Farey系列。

Annotation. The paper considers one of the methods for accelerating the calculation of the greatest common divisor GCD of natural numbers for given A and B on the basis of the k-ary algorithm. Such a problem arises when many mathematical and number-theoretic algorithms are implemented, for example, in cryptography and number theory (see [1]).

*Keywords*: greatest common divisor, binary algorithm, K-ary algorithm, Farey Series.

The task of accelerating the computation of GCD natural numbers is an important and relevant task, which has numerous applications.

The K-ard algorithm for computing GCD is a generalization of the binary algorithm and was developed simultaneously in the early 1990s by the American mathematician J. Sorrenson [2], [3] and the Austrian T. Jebeléan [4].

**Theorem (D. Sorrenson [2]).** For any natural numbers *A*, *B* and k > l, mutually simple with *A* and *B*, there are integers *x* and *y*.  $1 \le x < \sqrt{k}, -\sqrt{k} \le y \le \sqrt{k}$ , and

$$Ax + By \equiv 0 \pmod{k} \tag{1}$$

Consider how you can find the appropriate x and y values **by listing and using the Farey series.** 

It follows from (1) that  $y \equiv -AB^{-1}x \pmod{k}$ . We denote by q the value  $q = -AB^{-1} \mod k$ , the values of q from the interval (0,k), then  $y \equiv -qx \pmod{k}$ . The desired pair x and y can be searched by looking at successively the values of x from 1 to  $\sqrt{k}$  and calculating the negative and positive values of  $y = -qx \mod k$  and  $y = k - (qx \mod k)$ , until the value of y from the interval  $[-\sqrt{k}; \sqrt{k}]$ . Such an algorithm has an estimate  $O(k^{1/2})$ . Consider a faster algorithm using the Farey Series.

We will search for possible values of q for given x. We divide the algorithm into several cases depending on the values of the variable x:

1. x = 1. Then, y = -q, and from condition  $-\sqrt{k \le y \le \sqrt{k}}$  we find that  $1 \le q \le \sqrt{k}$  or  $k - \sqrt{k \le q \le k}$ . Couple (x, y) will take (1, -q) in the first case or (1, k-q) in the second.

2. x = 2. In this case, inequality  $\frac{k-\sqrt{k}}{2} < y < \frac{k+\sqrt{k}}{2}$ , and (x, y) = (2, k-2q) or (x, y) = (2, 2q-k) depending on in which half of the interval  $\left[\frac{k-\sqrt{k}}{2}; \frac{k+\sqrt{k}}{2}\right]$  is q.

3. Now let x take an arbitrary value x = n from the interval [1;  $\sqrt{k}$ ]. Solving the inequality  $-\sqrt{k} \le -qn \mod k \le \sqrt{k}$ , we get the range of the variable q, consisting of *n*-1 subinterval length  $(2\sqrt{k})/n$  with centers in points mk/n, m = 1, 2, ..., n-1. For example, with x = 3 we get two intervals of values of q length  $(2\sqrt{k})/3$  with centers in points k/3 and 2k/3

Summarizing the above, we find that finding the value of x can be found by the fraction nearest to q of the form mk / n, where 0 < m < n < k and setting the value of x equal to n. If we denote the fraction q / k by  $\alpha$ , then our problem is equivalent to finding for the given real number  $\alpha$  from the interval (0; 1) a regular fraction m / n with a numerator and denominator less than the parameter  $\sqrt{k}$ , which approximates the value of  $\alpha$  most exactly.

We can find a suitable fraction using the Farey Series. This algorithm is described in detail in [5]. We denote the value of  $\sqrt{k}$  by *s*.

Example. Let k = 64, and q = 45. Then, s = 8, and  $\alpha \approx 0.703$ . We choose an interval containing  $\alpha$ :  $\alpha \in (2/3; 3/4)$ . Building medians, we obtain a chain of intervals containing  $\alpha$ 

$$\left(\frac{2}{3},\frac{3}{4}\right) \rightarrow \left(\frac{2}{3},\frac{5}{7}\right)$$

The process of constructing the refining intervals is completed, since the denominator of the next median is 10 and exceeds  $\sqrt{k} = 8$ . As *x*, we can take both 3 and 7, obtaining pairs (*x*, *y*) = (3, -7), and (*x*, *y*) = (7,5).

*Lemma*. For given natural numbers *A*, *B* and *k*, the search for the coefficients *x* and *y* satisfying condition (1) of the Sorenson theorem can be performed in the time  $O(\ln k)$ .

The proof follows from the fact that the construction of a new median reduces the estimate of the distance from the nearest interval boundary to  $\alpha$  by half.

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# 计算机程序实例中水准测量的计算自动化 Automation of the calculation of the log of leveling on example of a computer program

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在文章中,我们考虑了通过分析方法计算测井平准测井的方法,以及使 用计算机程序进行计算的例子。

关键词:调平,调平杆,点标记,建筑物网格。

**Annotation.** In the article the method of calculation of the logging leveling log by analytical method is considered, as well as an example of calculation using a computer program.

Keywords: leveling, leveling rod, point mark, building mesh.

As a result of the breakdown of the construction grid on the construction site, it becomes necessary to determine the marks of the points of their vertices. To transfer the first marks of points, the so-called tie-in is used (Figure 1). The length of the tie stroke can be different, depending on where the frame is located (Pn-11 in Figure 1). Between the reference point and the extreme points of the building grid, because of the length of the tie-in, as well as the terrain and terrain, intermediate points appear  $x_1, x_2$ . As a result, we begin to calculate the log of the leveling of the tethering path (Table 1).

The log of the leveling of the tie stroke (Table 1) in the field is filled up to the columns: «*a*» and forward «*b*» inclusive. After this, proceed to the desktop processing of the leveling log. Cameral processing includes the calculation of: excesses between points of closed leveling ( $h_{\rm EBFY}$ ); average elevations at stations ( $h_{\rm cp}$ ); corrected exceedances ( $h_{\rm HCTIP}$ ), as well as point marks (*H*).

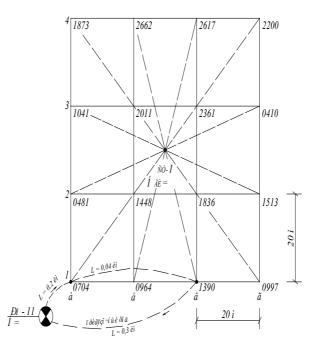


Figure 1 - Scheme of leveling with samples

Nº	Name of	countd					
	points	backward « <i>a</i> »	forward «b»	h <sub>выч</sub>	h <sub>cp</sub>	h <sub>ucnp</sub>	Н, м
1	Рп — 11	1800	1560				
	x <sub>1</sub>	6482	6240				
2	X <sub>1</sub>	1700	1260				
	1a	6385	5945				
3	1a	1020	1710				
	1в	5704	6396				
4	1в	1721	1730				
	x,	6407	6416				
5	x <sub>2</sub>	1735	1723				
	Рп – 11	6418	6406				
		$\sum a =$	$\sum b =$				

Table 1 - Magazine leveling log

Formula for calculating the excess  $h_{_{Bbl}y^2}$  M:

$$h_{\rm gaug} = a - b \tag{1}$$

Where: a - countdown on the leveling rod to the rear point, mm; b - countdown on the leveling rod to the front point, mm.

The formula for calculating the average excess  $h_{ch}$ , M:

$$h_{\rm cp.} = \frac{h_{\rm BHV,1} + h_{\rm BHV,2}}{2}$$
(2)

where  $h_{_{ebull}}$ ,  $h_{_{ebull}}$  – the excess obtained by formula (1), m.

Corrected exceedances are obtained by calculating residuals, which are distributed over average excesses with the opposite sign.

Formula for calculating corrected elevations  $h_{ucnp}$ , M:

$$h_{\text{ucmp.}} = h_{\text{cp.}} \pm f_h \tag{3}$$

The formula for calculating the discrepancy  $f_h$  (for closed run), m:

$$f_{h} = \sum h_{cp} - (H_{KOH} - H_{HAY})$$
<sup>(4)</sup>

where  $\sum h_{cp.}$  - the average value of the sums of counts on the leveling rod to the rear and front points, m;

 $H_{HAY}$  – the mark of the initial reference point, m;

 $H_{KOH}$  – the mark of the final reference point, m.

$$\sum h_{cp} = \frac{\sum a - \sum b}{2}$$
<sup>(5)</sup>

where  $\sum a$  – the sum of readings from the leveling rod to the backsight point, mm;

 $\sum b$  – the sum of readings from the leveling rod to the front point, mm.

The entire calculation is terminated by calculating the marks of the stations of the tie-in stroke using formula:

$$H_{n+1} = H_n + h_{\text{ucnp.}} \tag{6}$$

where:  $H_{n+1}$  – mark the next point, m;  $H_n$  – mark the previous point, m.

To reduce the processing time of the logging leveling log, a computer program was developed for the "Calculation program of the alignment log" (Fig. 2 - 4).

The program is designed to automate the calculation of the log of leveling the anchorage, which is one of the initial elements of the design of the vertical planning, which is part of the master plan of construction. The functionality of the program is to determine: the excess between the points of a closed leveling path; average elevations at stations; corrected excesses obtained by calculation of the residual, distributed over medium excesses with the opposite sign; marks of stations of the traverse. Application. The program is intended for use in research and educational purposes, as well as in production and technical departments of construction and design organizations [1-2].

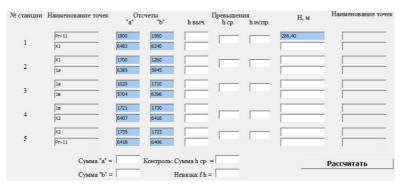


Figure 2 - The program window with the input data entered

№ станции	Наименование точек	Отсчеты "a" "b"		Превышения h выч. h ср. h испр.			Н, м	Наименование точек	
1	Pn-11 X1	1800 6482	1560 6240	0,24	0,241	0,2424	286,40 286,6424	Pn-11 X1	
2	X1 1a	1700 6385	1260 5945	0,44	0,44	0,4414	286,6424 287,0838	X1 1a	
3	1a 18	1020 5704	1710 6396	-0,69 -0,692	-0,691	-0,6896	287,0838 286,3942	1a 18	
4	18 X2	1721 6407	1730 6416	-0,009	-0,009	-0,0076	286,3942 286,3866	18 X2	
5	X2 Pn-11	1735 6418	1723 6406	0,012	0,012	0,0134	286,3866 286,4	X2 Pn-11	
	Сумма "a" = [39372 Контроль: Сумма h ср. = [-0,007 Рассчитать]								

Figure 3 - The program window with the results



Figure 4 - Certificate of state registration of the computer program

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# 耦合异质结构中的瞬态过程 Transient processes in coupled heterogeneous structures

#### Ismailov Bahram Israfil

Candidate of Engineering Sciences, Associate Professor Azerbaijan State Oil and Industry University,

该报告介绍了分数阶多维耦合异构混沌系统瞬态过程的研究结果。 在 热力学信息方面提出了非广泛系统的数学模型; 显示了交互组织和研究算 法的结构。显示了干扰领域中系统的相互作用的例子。

关键词: 瞬态过程, 分数超混沌系统, 庞加莱图, Tsallis熵, 奇美拉状态

Annotation. The report presents the results of studies of transient processes in multidimensional coupled heterogeneous chaotic systems of fractional order. The mathematical model of non-extensive system is presented in the aspect of thermodynamic information; the structure of the organization of interactions and research algorithms is shown. Examples of interactions of systems in the interference field are shown.

*Keywords*: transient processes, fractional hyperchaotic systems, Poincare diagrams, Tsallis entropy, Chimera states.

## 1. Introduction

The report is devoted to the results of the research of interactions and transients in coupled heterogeneous multidimensional chaotic systems of fractional order using non-standard analytic-numerical methods. The flow of transient processes between interacting systems within the "open system" is accompanied by an abundance of competitive conditions, the interdependence of information and physical flows [1,2,3,4,5]. The use of methods of fractional dynamics opens up new possibilities for solving forecast problems and making decisions in "open systems". The mathematical model of research is formulated taking into account the thermodynamic-information aspect, which allows one to consider the processes of energy transformation from a unified point of view. Attention is also drawn to the fact that the important fact is that the ongoing processes occur in the field of interference, which also influences the evolution of newly organized structures.

### 2. Basic research tools and methods

To assess the dynamics and parameters of the processes of mutual influences in coupled systems, the demand for a generalized criterion for recognizing the state of the system is important. In conducting research, an index based on synergetic principles was used as a generalized criterion [4]. The application of the Poincare return time of measurement spectrum describing the geometric, information and dynamic characteristics of transient processes is proposed [6].

To measure the state of disorder in the system, the thermodynamic category, the entropy of Tsallis, was used, which made it possible for the first time to interpret the use of the model in terms of coherent analysis. It is known that the change in the value of entropy in "open systems" is classified as a quasi-statistical parameter [1,2,3,4,5].

Interaction processes in the "open system" are characterized by parameters that allow to assess such states as chaos-quasi-periodic-hyper chaos and so on.

So, for example, along with the traditional parameters characterizing the behavior of nonlinear dynamical systems, the chimera state is investigated, under which regions of coherent and incoherent oscillations are observed [7,8,9,10].

In the examples of interacting related systems, hyperchaotic fractional-order systems of Rabinovich-Fabrikant, Chen, Qi, Liu were used, and as a resonant causative agent Hyper Jerk system and correcting Chimera states trajectories [11,12,13,14,15,16].

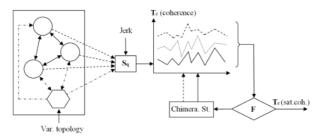
## 3. Mathematical model, structure and algorithms of research

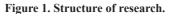
For a non-extensive system, the mathematical model has the term:

$$s_q = \left[ \left\{ \sum_{i=1}^N s_q \left( D^q x \right) + \frac{1 - \hat{q}}{n} \prod_{i=1}^N s_q \left( D^q x \right) \right\} + GM \right],$$

where  $S_q$  in the entropy of the Tsallis,  $D^q x$  - fractional dynamic systems, N - number of elements in the system, GM - generalized memory [4], n - parameter.

The structure of research of the coherence behavior systems is presented in Figure 1 and based on the analysis of the trajectory of the process in the context of the chosen area of interests satisfying the conditions of Definition 1, and allows to obtain satisfactory coherence, the Tsallis entropy, the stability and Poincare diagram [17,18].





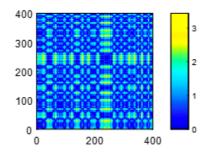


Figure 2. Plot of distance matrix of metastable chimera's trajectory.

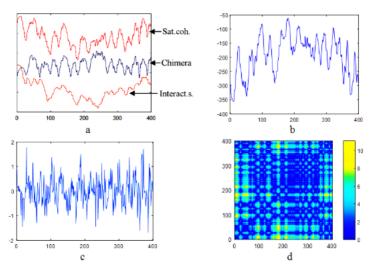


Figure 3. a – search satisfactory coherence, b - Tsallis entropy, c - stability, d -Poincare diagram of distance matrix.

#### Conclusion

The paper is devoted to the investigation of the dynamics of connected multidimensional chaotic systems of fractional order. The report presents the mathematical model and structure of research, shows examples of the results of studies of the iterative search for satisfactory coherence, calculated for them values Tsallis entropy, Stability, Poincare diagram of distance matrix.

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# 语义信息及其对决策的影响 Semantic information and its influence on decision-making

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文章的作者是指分析语义信息价值对快速决策的影响。 这个分析证实 了D. Kahneman关于快速思维的基本特征(或系统1)的结论。 文章还首次 对心理学"卡桑德拉效应"进行了逻辑解释,并对所得到的数据进行了外 推,并提出了该领域研究进一步发展的途径。

关键词:决策理论,语义信息,战略,思维快速,卡桑德拉效应,错误信息

Annotation. The author of article refers to the analysis of the influence of the value of semantic information on making quick decisions. This analysis confirms the conclusions of D. Kahneman on the basic characteristics of fast thinking (or System 1). Also in the article the logical interpretation of the psychological "Cassandra effect" is given for the first time, the obtained data are extrapolated and ways for further development of research in this area are suggested.

*Keywords*: decision theory, semantic information, stratagem, fast thinking, Cassandra effect, misinformation

#### Introduction

The theory of decision making occupies one of the leading places in modern interdisciplinary science. In many respects this was made possible thanks to the discoveries made by scientists such as Maurice Alla, Gary Becker, Robert Simon, Daniel Kahneman and Almas Tversky, David Leibson, Dan Ariali, Richard Tyler, etc. At present, the need to study the features human behavior and decision-making is beyond doubt.

In our previous papers [5; 6; 7], the main factors that affect not only the decision-making process itself (time, information, environment, etc.), but also the nature of the decision itself (*stratagem / strategy*) have already been considered. In this article, we restrict ourselves to the influence of the information factor.

In modern information theory, the following gradation of information types has now taken shape: syntactical (the form and ways of information transfer), pragmatic (the psychological influence of this or that information) and semantic information (meaning and truth of this or that expression, judgment or data). Given the unpredictable and sometimes hard-to-reduce nature of various kinds of psychological experiments, we decided to confine ourselves to the framework of semantic information and its influence on rapid decision-making. It is worth noting that the nature of fast thinking was devoted to the famous theory of Daniel Kahneman, in which he speaks of the existence of two systems of thinking (*System 1* and *System 2*) [10].

The first system (*System 1*) is fast thinking. It is illogical, spontaneous and, as a rule, a person, undergoing various kinds of stresses and arousals, often resorts to its use both in daily activities and in all sorts of specific and professional situations. *System 1*, in our opinion, corresponds to a *stratagem*, as a kind of solution that is distinguished by a high degree of non-ergodicity, extremely shortened time frames (time points), and a small number of variants (zugzwang). The experiment described below completely confirms this description of D. Kahneman with respect to *System 1*, but it also indicates the influence of semantic information on stratagems.

#### Materials and methods

The materials for this study were: data from a sociological survey among students of the Kursk State University. In the implementation of this study, methods were used: sociological interrogation, comparison, extrapolation and analysis of statistical data obtained, logical translation and interpretation of expressions from natural language into the language of predicate logic of the first order and construction of truth tables.

#### Results

So, the experiment was conducted in the form of a sociological survey, among a group of 40 students aged 18 to 23 years, who have the basics of logical thinking and analysis. They were asked to choose the most correct, in their opinion, expression of two neutral and fairly close in meaning. The only condition was that the choice should be made within 15 seconds.

**Statement 1:** «*There are no clouds in the sky, therefore, it's raining or not*»;

**Statement 2:** «*There are cases when there is not a single cloud in the sky and it rains, and also such cases when the entire sky is covered with clouds and there is no rain*».

The results of the survey are shown in the diagram below [Figure 1].

Under number 3, the percentage of those participating in the survey is indicated, which in response did not satisfy the experimental conditions.

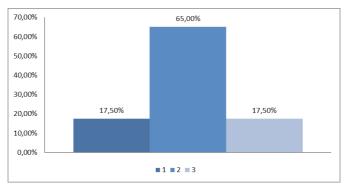


Figure 1. Diagram of responses of subjects

The two proposed statements did not just meet the criterion of neutrality and close meaning. They were artificially chosen so that both the first and second utterance represented a complex judgment from the point of view of classical formal logic, while the former would be the identically-true formula (ITF), and the second the identically-false formula (IFF).

To verify the obtained data, the same experiment was repeated in two more groups, which corresponded to the conditions indicated above. In the second group the following results were obtained: 1 - 5 (12.5%); 2 - 29 (72.5%); 3 - 6 (15%), and in the third: 1 - 6 (15%); 2 - 27 (68.5%); 3 - 7 (16.5%). Summarizing the data from the three groups, we obtain: 1 - 15%; 2 - 68.8%; 3 - 13%. As can be seen from the statistical data, in all three groups the absolute majority of the subjects chose the second expression, namely IFF, and not ITF. Recall that ITF in logic is a formula that, regardless of the variables that it includes in all cases (or possible worlds), reaches the value of "truth". ITF is the formula of the logical law on the basis of which the logical and arithmetical axiomatics (Boolean algebra, de Morgan laws, etc.) are given. In mathematical logic, such formulas possess 100% feasibility. IFF in logic is a formula that, regardless of the variables that it includes in all cases (or possible worlds), reaches the value of "false". IFF is a classic example of a logical contradiction. In other words, with the rapid decision-making, the absolute majority of all three groups of subjects deliberately chose a contradiction, rather than a logical law.

In order to understand the reasons for this choice, one should turn to the logical basis of the statements presented above. So, according to D. Kahneman, *System 1* does not use logical operations, it should be noted that when making a quick decision, the subjects experienced the influence of a different factor. During the analysis of two expressions, in addition to the difference in the logical formulas, the

indicated expressions also revealed differences in the level of the semantic information contained in them. In order to determine the semantic information for each expression, we translate them into the symbolic language of the Frege-Russellian logic and construct a truth table.

# Statement 1: $(\overline{p} \rightarrow q) \lor \overline{q}$

p	q	$\overline{p}$	$\overline{q}$	$\overline{p}  ightarrow q$	$(\overline{p}  ightarrow q) \lor \overline{q}$
1	1	0	0	1	1
1	0	0	1	0	1
0	1	1	0	1	1
0	0	1	1	1	1

Statement 2:  $(\overline{p} \lor q) \land (p \land \overline{q})$ 

p	q	$\overline{p}$	$\overline{q}$	$\overline{p} \lor q$	Λ	$p\wedge \overline{q}$
1	1	0	0	1	0	0
1	0	0	1	0	0	1
0	1	1	0	1	0	0
0	0	1	1	1	0	0

Under the semantic information or under the content of the sentence A we mean the set  $M/M_A$ , which shows how the acceptance of the sentence A narrows the scope of the possible.

The value of the semantic information is the measure of the restriction of the initial set of possibilities M, defined in the closed interval [0, 1] and defined by the formula:

$$Inf(A) = 1 - \frac{\kappa(MA)}{\kappa(M)},$$

where Inf(A) – function that determines the amount of information (content) that the logical form of the sentence A carries, and k is a function characterizing the power of each subset of the set M.

Calculate the value of the semantic information for statements 1 and 2.

1) Inf 
$$(A_1) = 1 - \frac{4}{4} = 0$$
;  
2) Inf  $(A_2) = 1 - \frac{0}{4} = 1$ 

The value of the semantic information obtained for each statement indicates that when making a quick decision, the subjects preferred not just a deliberately false statement from a logical point of view or contradictions, but also a variant in which the amount of semantic information was greater.

#### Discussion

A similar experiment with the same subjects was carried out using other variants of ITF and IFF, in which the revealed tendency and feature of decision-making remained. And also in binary oppositions of varying degrees of satisfiability of formulas. The results of the experiment indicated the preservation of the trend identified above, namely: the greater the amount of semantic information (and the correspondingly smaller the feasibility of the formula), the greater the number of respondents chose this option.

# $Inf(A) \uparrow (F_A \downarrow) > D(v) \uparrow = const$

where Inf(A) – the value of the semantic information of statement A,  $F_A$  – the feasibility of the logical expression formula A, a D(v) – the value of the chosen statement A.

The above paradox in the semantic theory of information is known as the "*Bar-Hillel-Carnap paradox*". The famous Italian scientist Luciano Floridi in a series of his works [8; 9] proposed a way out of it, by introducing the concept of a *con-tingently false sentence*. In the work of the researchers, Pogorelov [2] and Ruurik [12] proposed the introduction of the concept of *disinformation* (in Florida it is presented as *a degree of inaccuracy of conventionally false assumptions*), which is an integral part of any message and knowledge. However, both the first and the second, for the most part, set the task to solve the paradox, and not to study it

The influence of semantic information on decision-making thus, in a sense, tends to explain the so-called "*Cassandra paradox*" or "*Cassandra complex*", which takes a special place in psychoanalytic studies by Melanie Klein [11], Lori Layton Shapira [3] and Jane Shinoda Bolen [4], as well as the "Cassandra effect" in politics, business and intelligence [1].

#### Conclusion

Based on the research carried out within the framework of this article, the following conclusion can be drawn: in binary oppositions and in the rapid decision-making, the amount of semantic information influences the choice of subjects.

Perspective, in our opinion, will be the continuation of research in this field on the subject:

- refinement and verification of the results of the conducted studies;
- use in ternary and n-ary logical operations;
- Use in richer languages of logic;
- identify additional factors that influence the choice;
- Expansion of the group of subjects;

• establishing a functional relationship between the value of semantic information and the sample.

The practical significance of the research is that its results enrich the understanding of the nature of human decision-making, give a logical interpretation of the "*Cassandra effect*," and can also be used to develop various kinds of expert assessments.

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用化学和电化学氧化法研究大卡拉陶(南哈萨克斯坦)钒矿的钒浸出过程

# Studying the process of vanadium leaching from vanadium ores of Big Karatau (Southern Kazakhstan) by chemical and electrochemical oxidation methods

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本文介绍了通过化学和电化学氧化对大卡拉陶的焙烧和未燃烧钒矿石中 的钒进行酸浸的实验研究结果。已经确定,在煅烧(煤渣)钒矿石中钒的 酸浸过程中,发生钒的部分氧化并且目标组分的提取不超过30%。钒的进 一步氧化需要更强的化学氧化剂,如过氧化氢或电化学氧化。当在具有铅 阳极和石墨阴极的分离的电极空间的MK-40膜电池中在65℃的温度下以200A / m 2的电流密度进行电化学氧化处理(铅阳极)1小时和在硫酸初始溶液 的浓度为10%,阳极区以120-150rpm的速度机械搅拌,钒提取到溶液中的 程度为69-70.1%,并且在预煅烧矿石的电化学氧化(煤渣)的指示参数--90.9-92.1%,这明显高于在化学氧化剂(10%H2O2)存在下用酸浸取得 的结果。

关键词:大卡拉套矿钒,溶液,电化学氧化,浸出,硫酸,浓缩,温度,矿石,回收,钒矿。

Annotation. This article presents the results of experimental studies on the acid leaching of vanadium from baked and unburned vanadium ores of Greater Karatau by chemical and electrochemical oxidation. It is established that during the process of acid leaching of vanadium from burnt (cinder) vanadium ores, partial oxidation of vanadium occurs and extraction of the target component does

not exceed 30%. Further oxidation of vanadium requires stronger chemical oxidants, such as hydrogen peroxide or electrochemical oxidation. When conducting an electrochemical oxidation process (lead anode) in a MK-40 membrane cell with separated electrode spaces with a lead anode and graphite cathode at a current density of 200 A /  $m^2$  at a temperature of 65 ° C for 1 hour and at a concentration of the initial solution of sulfuric acid 10% with mechanical stirring of the anode zone at a speed of 120-150 rpm, the degree of vanadium extraction into the solution is 69-70.1%, and in the electrochemical oxidation of pre-calcined ores (cinder) in the indicated parameters - 90.9-92.1%, which is significantly higher than the results obtained with acid leaching in the presence of a chemical oxidant (10 % H,O,).

**Keywords:** vanadium, solution, electrochemical oxidation, leaching, sulfuric acid, concentration, temperature, ore, recovery, vanadium ores of Greater Karatau.

The consumption of vanadium in the world in recent years has been steadily growing due to a worldwide increase in the production of special steels (tool, alloy and high-strength), as well as the production of alloys (mainly titanium) [1]. Experts predict that in the next 5 years the prices for vanadium will grow, as its production from both by-products (steel, titanium, coal and other industries), as well as from primary ores can not yet meet the growing demand unless new producers appear on the market vanadium.

Sedimentary iron ores, titanomagnetites, phosphorites, bauxites, clays, ashes of some coals, oil shales, oil can serve as sources of vanadium. Until now, on an industrial scale, vanadium was obtained mainly from iron-titanium ores using pyrometallurgical methods [2]. This source accounts for about 70% of all vanadium produced in the world [3].

In Kazakhstan, one of the largest deposits of vanadium is the Vanadienous Basin of Greater Karatau, which includes the Balasauskandyk and Kurumsak fields. It is considered off-balance due to the lack of a profitable technology for the production of vanadium [4]. Until now, the ore of these deposits has not been processed. However, according to many Soviet scientists [5], these ores were considered the most "technologically advanced", where the content of vanadium is 8-10 times higher than in iron and titanomagnetite ores.

In the works of SG. and E.A. Ankinovich, I.S. Zabubin and other researchers [6-12 and others] noted that the main carrier of mineralization of vanadium in the vanadium pack of Greater Karatau are carbonaceous-argillaceous-siliceous schists; The content of vanadium is somewhat lower in carbonaceous-siliceous-argillaceous shales, while the remaining species bear low concentrations of vanadium. The content of vanadium pentoxide in carbonaceous-siliceous-siliceous

shales is not constant and ranges from 0.64 to 4.0-4.5%

As a result of our studies on a detailed study of the mineralogical composition and properties of the ores of these deposits in Greater Karatau, it was found that the main mineral carriers of vanadium in the primary shales not oxidized: sulvanite  $(Cu_3V^{5+}S_4)$ ; patronit  $(V^{4+}(S_2^{-2})_2)$ ; as well as vanadium micas: black anite  $((Ba,K,NH^+_4)(V^{3+},Al,Mg)_2[(Si_{4-n}Al_n)_4O_{10}](OH)_2)$  (Table 1); barium roskoelit  $((K,Ba)(V^{3+},Al,Mg,Fe)_2[(Si_{4-n}Al_n)_4O_{10}](OH)_2)$  (table 2); vanadium-containing muscovite and fengite  $((K,Ba,Ca)(Al,Mg,V^{3+},Fe)(Si,Al)_4O_{10}(OH)_2)$ .

Components	1	2	3	4	5
SiO <sub>2</sub>	29,90	30,06	34,86	34,66	35,24
$\frac{\text{Al}_2 \text{O}_3}{\text{Fe}_2 \text{O}_3}$	25,90	27,24	16,32	16,68	17,06
Fe <sub>2</sub> O <sub>2</sub>	0,40	0,36	0,00	0,00	0,00
$ \begin{array}{r} Cr_2O_3 \\ V_2O_3 \\ V_2O_4 \\ FeO \end{array} $	0,00	0,00	0,00	0,15	0,09
V_0,	18,30	18,90	20,31	19,47	19,68
$V_2 O_4$	5,40	5,30	6,65	6,36	6,43
FeO	0,00	0,00	0,08	0,21	0,01
NiO	0,00	0,00	0,00	0,09	0,06
MgO	1,60	trace	0,31	0,01	0,33
BaO	9,35	9,60	11,83	12,98	12,24
Na <sub>2</sub> O	1,32	0,00		0,04	0,12
K,Ô	0,70	0,90	4,87	4,74	4,74
$H_2O^+$	6,00	6,10			
H <sub>2</sub> O <sup>-</sup>	1,10	1,00			
e	99,97	99,46	95,23	95,39	96,00

Table 1. Chemical composition (wt.%) of black anite

The technology of processing such vanadium ores will be very complex, since they have a heterogeneous mineralogical, complex chemical composition. In addition, until today, the enrichment of vanadium ores by the methods of centrifugal separation, considered in recent years, as an alternative to the flotation method of enrichment, have not yielded positive results, i.e. Vanadium-containing ores are difficult to enrich themselves [12-13]. In the typical ore of the Greater Karatau there are vanadium compounds corresponding to the valencies IV, III and V (II rarely found), as well as other valuable components like uranium and rare earth elements. Until now, the ores of the Greater Karatau, including the Balasauskandyk deposit, have been investigated using autoclave leaching methods followed by sorption of vanadium, as well as chemical leaching with preliminary oxidative firing. But these studies have not yielded satisfactory results. In our opinion, the application of the electrochemical method can allow the processing of vanadium ores of Greater Karatau with the complete extraction of valuable components from them, as well as create new or improve vanadium production technology. As revealed in the literature review, that among the known methods of processing

vanadium ores in the world, the study and application of electrolytic methods for processing vanadium ores of Karatau is of great practical interest. It should be noted that the electrochemical method of vanadium oxidation is used successfully in the processing of vanadium waste catalysts for the transfer of tetravalent vanadium to the pentavalent.

When studying the process of electrochemical oxidation of vanadium ore in Bolshoy Karatau, we selected several samples of unenriched raw (not burned, see tables 3-4) and preliminarily burned (vanilla) vanadium ores from the Balasaus-kandyk and Kurumsk deposits.

N         Components         1         2         3         4         5         6         7         8         9         10           SiO,         36,77         36,89         42,88         44,87         1,25         45,17         44,65         48,68         47,20           TiO, $x$ </th <th>际~</th> <th></th> <th></th> <th>Table 2 -</th> <th>Chemical</th> <th>composit</th> <th>Table 2 - Chemical composition (mass%) of barium roskoelit</th> <th>of bariu</th> <th>m roska</th> <th>oelit</th> <th></th> <th></th>	际~			Table 2 -	Chemical	composit	Table 2 - Chemical composition (mass%) of barium roskoelit	of bariu	m roska	oelit		
	くい	Components	1	2	3	4	2	9	7	×	6	10
	1	$SiO_2$	36,77	36,89	42,98	44,87	41,25	45,17	42,87	44,65	48,68	47,20
		TiO,				trace		0,78		0,12	0,56	0,36
		$Al_{2}O_{3}$	16,81	17,08	19,37	14,21	14,14	11,54	21,90	19,47	9,46	9,25
		$Fe_{2}O_{3}$			0,34	0,94	1,13				2,90	3,70
		$Cr_{2}O_{3}$		0,02		0,32					4,72	2,38
		$V_2O_3$	13,57	13,38	17,92	16,44	23,59	24,01	17,42	11,96	8,76	13,20
		$V_2O_4$	12,75	12,57								
		FeO	0,12	0,03	Undef.	Undef.		1,60	1,74	2,26	1,20	Undef.
		MnO			*	×	$Mn_{2}O_{3}1,15$			0,05	0,04	0,05
		MgO	0,59	0,69	2,08	3,50	2,01	1,64	1,06	1,99	10,70	8,50
		BaO	10,01	9,80	5,27	7,20						
		CaO			0,48	0,81	0,61		0,07	0,10	0,02	0,75
		$Li_{2}O$									0,46	0,42
		Na,O	0,02	0,18	0,13	0,18	0,82	0,06	0,27	0,01	0,23	0,78
		K,0	4,96	5,15	5,91	5,13	8,56	10,37	9,91	10,12	8,58	10,45
		$\rm H_2O^+$			5,31	5,66		4,29	4,76			2,17
		H <sub>2</sub> O <sup>-</sup>					3,35	0,40				
		F									1,65	1,17
		SO,	NiO 010		0,64	1,29					0=2F	0=2F
		n d	0,12	05 70	100.12	100.55	06.61	100.0	100.0	01 17	0,71	0,49
		ט י י	21,06	61,06	100,45	CC,UU1		100,U	100,0	71,42	UC, <i>KK</i>	. 5127
	I	Note: Assays 1, 2 -	Colo [10]	00P; 3-4 - 18 8-10 – rosk	umellar, scal oelit [10]	y [10]; 5 - 3	stocklager min	e, Placervi	lle, Calif	. [10]; 6 -	Stocklager 1	mne [10];
	14	( I T TITTE I TITLE )	([a]	WGO1 01 0								
	-											

国际会议

上合组织国家的科学研究:协同和一体化

	S	100	100	100	100	100	100	100	100	0	s	100	100	100	100	100	100	100	100
osit	$\mathbf{O}_2$	49,39	50,87	51,69	52,68	55,32	59,40	58,46	59,55	(	02	32,04	37,78	38,00	57,13	58,30	65,09	68,05	61.16
Table 3. Chemical analysis (mass%) of ore samples from the Balasauskandyk deposit	Cr	0,24	0,17	0,17		'	0,23	0,25	0,24	;	Ba	8,15	7,61	7,93			1,21	1,32	2.57
sauskan	>	0,64	0,71	0,77		,	0,61	0,62	0,85		>	0,97	1,04	1,37		1	0,28	0,22	0.51
he Bala	Ï	0,33	0,48	0,48	0,12	0,06	0,24	0,21	0,30		Ca	0,15	0,55	0,36	0,22	0,11	0,03	0,12	0.00
from t	Ca	0,57	0,46	0,30	0,73	0, 19	0,39	0,39	0,38										
amples	K	3,10	3,76	3,23	3,58	3,13	2,74	2,76	3,09		K	2,32	2,31	2,60	0,14	0,10	0,53	0,56	1.01
of ore s	S	0,37	0,34	0,53	1,02	0,19	0,26	0,50	0,38		S	3,49	2,73	3,53	'		1,09	1,25	1.37
ass%) (	Ь	0,38 (	0,19 (	0,42 (	2,18	0,01 (	0,32 (	0,35 (	0,28 (		Ь	1, 14	0,42	0,61		ı	0,35	0,28	0.28
ysis (m											Si	37,74	37,53	34,42	41,89	40,83	27,21	23,74	28.29
anal	Si	35,24	33,70	33,63	28,15	33,31	28,73	28,86	26,35										
emical	AI	6,85	7,28	6,48	7,06	6,83	5,19	5,77	6,31	-1 M) CIC	A	6,93	5,56	6,90	0,32	0,37	1,74	1,70	3.03
ole 3. Ch	Mg	0,52	0,43	0,54	0,87	0,68	0,47	0,40	0,64		Mg	I	ı	ı		ı	0,07	0,12	0.20
Tab	Fe	2,37	1,61	1,76	3,61	0,28	1,42	1,43	1,63		Fe	7,07	4,47	4,28	0,30	0,29	2,40	2,64	1.58
	Elements	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8		Elements	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8

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Experimental studies of electrochemical oxidation were carried out on a membrane electrolyzer MK-40 with separated electrode spaces. Preliminary determined the main parameters affecting the degree of vanadium oxidation, this is the type and concentration of the electrolyte, anode material and temperature. Prior to the beginning of the experiment, the ore and cinder were weighed to 0.01 mm in size, then they were separately mixed with an electrolyte of the specified concentration (5, 10 and 15% sulfuric acid) in a ratio of T: H = 1: 4 and the resulting pulp was filled in the anode space of the cell, and only the electrolyte into the cathode space. The anode was made from a lead plate, and the cathode was made of graphite. The optimum value of the anode current density was 200 A / m<sup>2</sup>. The process of electrochemical oxidation was carried out in the temperature range of 25, 45, 65 and 85 ° C. During electro-oxidation, the pulp in the anode space was stirred with a stirrer at a speed of 120-150 rpm for an hour. In the course of the process, gaseous oxygen formed on the anode can participate in the oxidation of vanadium.

At the end of the experiment, the solution was filtered and the vanadium content (V, IV) was determined in it and the cake. Some results of experiments on electrochemical oxidation are shown in the form of a graph in Figures 1 and 2.

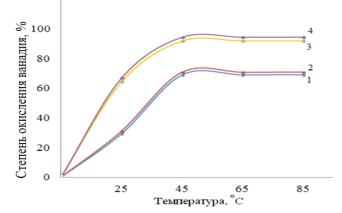


Figure 1 - Dependence of the degree of vanadium oxidation on temperature during electrooxidation: 1 - raw ore of the Balasauskandyk deposit; 2 - raw ore of Kurumsak deposit; 3 - burnt ore (stub) of the Balasauskandyk deposit; 4 - annealed ore of Kurumsak deposit

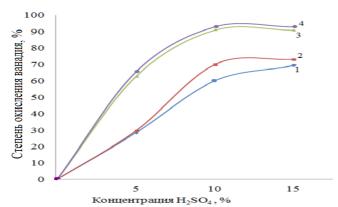


Figure 2 - Dependence of the degree of oxidation of vanadium on the concentration of electrolyte: 1 - raw ore of the Balasauskandyk deposit; 2 - raw ore of Kurumsak deposit; 3 - burnt ore (stub) of the Balasauskandyk deposit; 4 - annealed ore of Kurumsak deposit

Figure 1 shows that raising the temperature to 60-65 °C can intensify the process of electrochemical oxidation. A further increase in temperature does not increase the degree of oxidation of vanadium. In this case, it can lead to a change (decrease or increase) in the overvoltage to release gases ( $H_2$ ,  $O_2$ ), and also to increase adverse reactions. As a result, it was found that the optimum temperature is 65 °C.

When studying the effect of the electrolyte concentration (Fig. 2) on the oxidation of vanadium, it was found that the optimum concentration of sulfuric acid is 10%. An increase in the concentration of sulfuric acid to 15% is impractical.

Also, it can be seen from Figures 1-2 that the degree of oxidation of vanadium from pre-burned ores is much higher than from raw (unbaked) ores. This is explained by the fact that during preliminary roasting the vanadium ore is loosened and, possibly, the lower vanadium oxides are partially oxidized. At the same time, the degree of oxidation of vanadium from raw ores is 69-70.1%, and pre-calcined ores - 90.9-92.1%.

**Conclusion**. Thus, it has been experimentally proved that the maximum degree of oxidation of vanadium during electrochemical oxidation is achieved at a current density of 200 A/m<sup>2</sup> at a temperature of 65 °C for 1 hour and at a concentration of a starting sulfuric acid solution of 10% with mechanical stirring of the anode zone at a rate of 120- 150 rpm.

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#### 两轮电动车的区域分类方法的差异

#### The differences of the region-based classification methods of the twowheeled electric vehicles

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本文考察了不同国家的两轮和三轮电动运输(电动自行车,电动助力 车,电动摩托车,电动摩托车)分类方法的差异,为世界各国所接受的标 准。文章描述和比较了生物的分类方法

目前对两轮电力运输现有分类存在差异的问题很少进行讨论,但鉴于以 下因素,这一点非常重要:

目前缺乏统一的电力运输分类国际制度;

现有的两轮电力运输分类系统之间的主要区别;

电动自行车和其他类型低功率电动车市场的快速增长和发展。

在俄罗斯联邦领土上分类为欧盟(EU)国家的"电动自行车"的两轮电动车辆可以被分类为"电动摩托车"。按照国内分类认证的"三轮电动摩 托车"可以在英国十字路口变成"三轮电动车"。不同国家所采用的分类 方法的显着差异可能导致海关车辆设计方面的重大官僚困难,并使面向国际市场的产品开发复杂化。

所有现有的用于两轮电力运输分类的系统属于国家,不太频繁的区域特性。在开展研究的过程中,作者研究了大量规范各国对两轮电力运输分类 方法的规范性文件,并以系统图表和汇总表的形式图形化地显示了所获得 的数据。

关键词: 电动车辆分类;电力运输;电动自行车;立法和电动自行车;智能 电动车; EN 15194。

**Annotation.** This article examines the differences in the methods of classifying two- and three-wheeled electric transport (electric bike, electric moped, electric scooter, electric motorcycle) in different countries, accepted for the standard in various countries of the world. The article describes and compares the methods of

classification of creatures.

The problem of differences in the existing classifications of two-wheel electric transport is discussed quite rarely, but it is very relevant in view of:

• the absence at the moment of a unified international system for the classification of electric transport;

• cardinal differences between the existing systems of classification of twowheel electric transport;

• rapid growth and development of the market of electric bicycles and other types of low-power electric vehicles.

A two-wheeled electric vehicle classified on the territory of the Russian Federation as an "electric bicycle" in the countries of the European Union (EU) can be classified already as an "electric motorcycle". And the "tricycle electric motorcycle" certified according to the domestic classification can turn into a "threewheeled electric car" at the crossroads of Great Britain. Significant differences in the classification methods adopted in different countries can entail significant bureaucratic difficulties in the design of vehicles at customs and significantly complicates the development of products oriented to the international market.

All existing systems for the classification of two-wheel electric transport are of a national, less frequent - regional character. In the course of the conducted research the author has studied a huge number of normative documents regulating methods of classification of two-wheel electric transport in various countries and graphically shows the obtained data in the form of system charts and summary tables in this article.

*Keywords:* classification of electric vehicles; electric transport; electric bike; legislation and electric bicycles; pedelec; EN 15194.

#### Introduction.

Electric bike (in foreign sources - pedelec) - the concept in domestic scientific and technical literature is not fully established and therefore quite blurred in the mind of the consumer. In view of the compactness of modern electric drives, the engines are the same in size, can vary significantly in nominal power (up to two or more times). Therefore, it is often possible to see in the domestic market an electric moped, or even an electric motorcycle, positioned and sold as an electric bike (due to its similar appearance and the presence of a pedal drive). This is fundamentally not true and is a profanation of the classification of two-wheel electric vehicles. First of all, such mistakes are caused by an incorrect technical translation of foreign sources, because the English term "bicycle", most English-Russian dictionaries translates as "*Benocuned*". Whereas technically the term is more correctly translated as a "two-wheeled vehicle (*dbyxkonächoe mpahcnopmhoe cpedcmbo*)". In the wrong translation into Russian, the technical term "motor bicycle" can be written as a "bicycle with an electric motor", although in the context it is specifically about an electric motorcycle, devoid of pedals and mechanical drive. To avoid such misunderstandings, we will analyze the various approved classifications in more detail and compare them.

The purpose of the research conducted by the author is to analyze and identify the differences between the various methods for classifying two-wheel electric vehicles existing and currently in use in various countries around the world.

The material for the study was the profile regulatory documents and approved standards relevant for different countries. The author has studied the current technical requirements, standards and relevant sections of the road legislation of these countries. A comparative analysis of the standards established in different countries for two- and three-wheel electric transport was carried out.

Two- and three-wheeled transport using an electric drive can functionally differ: the type of electric drive, its maximum rated power and the control method (conditions for activating the electric drive). There are a huge number of different combinations of these factors and there is no uniform international technical specification for these vehicles.

Each country has its own regulatory classification for two-wheeled vehicles equipped with an electric motor, installed and controlled by local legislation and organizations regulating traffic.

**1** The internal classification of two-wheeled electric transport (adopted in the territory of the Russian Federation)

On the territory of the Russian Federation, the classification of two-wheeled electric transport is established by RF Government Resolution No. 221 of March 22, 2014 "On Amending Resolution of the Council of Ministers - Government of the Russian Federation of October 23, 1993 No. 1090 "About traffic regulations" [1].

Domestic legislation recognizes three main types of electric transport:

a) Bicycle with electric drive

b) Moped with electric drive.

c) Motorcycle with electric drive.

The State Road Safety Inspectorate of the Russian Federation equates these vehicles, respectively, with a bicycle, a moped and a motorcycle with an ICE.

The division in the domestic classification of two- and three-wheeled vehicles is based on three basic indicators:

a) The maximum speed developed by the vehicle (in the presence of pedals - when using only an electric motor).

b) Maximum rated power of the electric motor installed on the vehicle.

c) Mass of the vehicle.

Domestic classification does not take into account the design features of the

electric vehicle, such as:

- method of motor control;
- number of wheels of the vehicle;
- presence / absence of a pedal drive on the vehicle.

#### 2 Classification of two-wheel electric transport used in the countries of the European Union (EU), the United States of America (USA), Britain, Australia, Canada and Israel

On the territory of the European Union, two- and three-wheeled vehicles with an electric drive are classified and regulated in accordance with Directive 2002/24 / EU [2] and the consumer safety standard EN 15194 [3].

In the United States, general provisions and requirements for the safety of a vehicle equipped with an electric drive are governed by the consumer safety standard CPSC [4] and the laws of the specific state.

But despite the differences in regulatory constraints (speed limit, power and weight of the vehicle), the classification methodology, its main terms and concepts in the EU and the US are the same.

# Level 1. Division by the method of driving a vehicle

This level is allocated in the first place. All two- and three-wheeled electric vehicles in the classification adopted by the United States, Canada, Australia and the EU countries are divided into two classes, two subclasses and one mixed (hybrid) class, in accordance with the method of controlling the electric drive of the vehicle:

a) Pedal assistance, PAS.

b) Power-On-Demand, POD.

c) PAS + POD.

Formally, the method of controlling the electric motor does not affect and does not depend on the mass of the vehicle, the power of the installed electric drive or other parameters of the vehicle.

Despite this, low-power electric vehicles (e-bike, pedelec) often use a fully automatic system for activating, deactivating and changing the speed of the electric drive (PAS). That is, the speed of rotation of the electric motor on them is automatically replaced, in accordance with the algorithms of the device and the user can not influence this process.

While more powerful types of electric vehicles (electric moped / scooter, electric motorcycle, electric car) - use the manual method of controlling the speed of the POD electric motor, changing it with an electronic gas stick or control panel.

PAS (pedal assistant) - the method of controlling the electric drive of a vehicle equipped in addition to electric, crank-pedal drive on a chain (belt) transmission. The method consists in activating the electric drive with a decrease in the speed of rotation of the bicycle's pedals (wheels), below the specified speed of rotation.

As a rule, the electric motor is activated when the speed of the electric vehicle is reduced below 25 km / h.

POD (power-on-demand) - a method for controlling the electric drive of a vehicle. The method consists in activating the electric drive by the user manually. The instant the engine is switched on and the level of power consumed by it is determined by the user. The method of activation and selection of the power consumption level of the electric drive can be realized in one of the ways:

- throttle;
- digital control panel.

The method of controlling the speed of a vehicle is just as fundamental in the western classification of electric vehicles. The matter is that vehicles controlled by an electronic gas hose are considered much safer in the western countries in the road. This thesis is based on the fact that the handle of the gas allows you to react quickly to the situation on the road and stop the electric motor simply by releasing the throttle lever. And to stop the electric motor from the control panel, it is necessary to press the required key or a combination of them exactly.

Proceeding from this, POD class vehicles are strictly divided into subclasses *panel* and *throttle*. In this case, the regulatory restrictions and rules of behavior on the carriageway for these two subclasses vary significantly.

# Level 2. Types of two-wheeled electric vehicles

**Pedelec** (*pedal electric cycle*) is a kind of electric vehicle, it is a two-wheeled vehicle capable of being driven by both pedals and an electric motor. The term was first proposed in 1999 by the German graduate student Susanne Brüsch, in the report Pedelecs: Fahrzeuge der Zukunft [5] (*Pedelek: Transport of the Future*). The main distinguishing feature of the pedalec is the automatic engine management system PAS. That is, the vehicle's engine is automatically activated, if the driving parameters are reduced (for example, the speed of the vehicle is lower than the set speed or climbing the mountain). It is not possible to manually activate the electric motor with PAS.

In the UK, unlike the EU countries, the concept of "pedelec" replaces the same term Electrical Pedal Assisted Cycles - EPACs.

EU legislation allows the use of pedelec without age restrictions, the need to obtain rights and registration of a vehicle. Pedelec can go on bicycle paths and use them to move around the city and in the park recreation area [2], [3].

In addition to ready vehicles, there are also a number of special kits on the market that are designed for self-transformation of a conventional bike into a pedelec.

**S-pedelec** (from the English *speedy pedelec*) is a kind of two-wheeled electric vehicle. Can be driven by both pedals and an electric motor. It is a bicycle with an installed electric drive with increased characteristics (relatively pedelec).

The main structural difference between the vehicle s-pedelec and pedelec is

the presence (at the first) of the installed system of manual activation of the POD motor, instead of the automatic PAS system and increased engine performance.

S-pedelec is regulated by the classification of electric transport of individual countries (Germany, Italy, Norway, etc.) and is not global for the EU. In countries where the concept of s-pedelec is not used, vehicles of this type are classified as pedelec or electric moped (depending on the country). Despite this, the list of countries using this term is expanding rapidly. In Austria, s-pedelec is classified as a "moped" and has an age restriction on the use.

**Electric Moped** - a kind of two-wheeled electric vehicle. Can be equipped with pedals. By weight and characteristics of the installed engine and range is located between the electric bike and electric motorcycle.

As a rule, externally electric moped, it is almost impossible to distinguish from electric bike or S-pedelec, because the dimensions and mass of their components are identical and differ only in the characteristics of the engines. But some manufacturers trying as rationally as possible to take advantage of the power of the engine, use reinforced frames for which you can install more batteries.

**Electric Motorcycle / Electric Scooter -** a kind of two-wheeled electric vehicle. The most powerful and heavy type of two-wheel electric transport. Rarely can be equipped with pedals. Equipped with one or two powerful electric motors (over 250 watts per engine), a motorcycle or reinforced bicycle frame and a large battery (hydrogen fuel cell), which provides him with a significant range, comparable to the range of the motorcycle with ICE and fully fueled (up to 250 km). It differs from electric moped with the maximum permissible parameters of mass and speed of the vehicle, as well as increased power of the installed electric drives.

As in the case of electric moped, an electric motorcycle is classified on the territory of the Russian Federation as an "electric bike"

**Conclusions.** As shown by the results of the study, the methods for classifying two-wheeled vehicles differ significantly from country to country, in some cases being contradictory. This moment must be taken into account, and properly worked out in the development of electric vehicles that are oriented to the world market. During the compilation of the material, a search, analysis and systematization of information from various regulatory and regulatory documents of different countries was carried out. A summary table has been drawn up to determine how a particular model of a two-wheeled electric vehicle will be classified in these countries.

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准备用于从哈萨克斯坦铬铁矿和锰矿富集的小废物中获得铁合金的单梁 Preparation of a mono-beam for obtaining ferroalloys from small waste from enrichment of chromite and manganese ores of Kazakhstan

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介绍了铬铁矿和锰矿富集处理小废物的技术。为了实施该过程,使用固体碳对金属的固相还原。 确定了炉料各组分的质量比例,这是一种含铁,铬,锰氧化物和化学计量量的固态碳的粒状材料,用于生产铬铁和锰铁。 使用这种技术冶炼铁合金的特点是消除了焦炭的超额支出,这为通过替代燃料能量调节碳浓度和减少电力消耗提供了可能性。

关键词:单科,铁,铬,锰,矿石,碳,铁合金,废料,回收,球团, 冶炼

Annotation. The technology of processing small waste from enrichment of chromite and manganese ores is presented. To implement the process, the solid-phase reduction of metals by solid carbon was used. The mass proportions of the components of the charge are established, which is a granular material containing oxides of iron, chromium, manganese and a stoichiometric amount of solid carbon for the production of ferrochromium and ferromanganese. The peculiarity of the smelting of ferroalloys using this technology is to eliminate the overexpenditure of coke, which opens the possibility of regulating the concentration of carbon and reducing the consumption of electricity by replacing fuel energy.

*Keywords:* monoscience, iron, chromium, manganese, ore, carbon, ferroalloy, waste, recovery, pellet, smelting.

The preparation of the mono-slag and its pyrometallurgical processing are based on the solution of the actual problem of the effective utilization of accumulated metal-containing industrial wastes for the production of marketable products.

The term "mono-slag" refers to a prepared and treated mixture consisting of metal-containing components and carbon-containing reducing agents, the mass ratio of which is selected in such a way that a given composition of the metal and alloy is formed during re-firing and melting [1]. In this case, the basis of the "mono-slag is the accumulated waste from enrichment of manganese and chromite

ores. As already noted, metal-containing wastes are small or dispersed fractions, and the metal content is high enough. They are classified as waste due to the fact that almost traditional technology for the production of steel and alloys is based solely on the use of agglomerated raw materials [2]. The innovative technology being developed is aimed at efficient use of small and dispersed metal-containing waste. As iron-containing waste, small iron oxides are used, formed from the etching of the surface of rolled steel or rolling mill scale, in which the iron content reaches 68-69%. The fine wastes of the 5.0 mm fraction, accumulated manganese and chromite waste also contain fairly high concentrations of manganese oxides MnO<sub>2</sub> and Cr<sub>2</sub>O<sub>3</sub> oxides, respectively.

Manganese and chromium are valuable steel-alloying metals of strategic importance. Ferrous alloys are used for alloying steel at metallurgical plants around the world. Among them, ferromanganese and ferrochromium occupy a leading position.

The production of ferromanganese and ferrochrome belongs to the priority direction in metallurgy. By traditional technology for their production, sorted lump manganese and chromite ores are used, respectively. Coke is used as the reducing component.

In Kazakhstan, the corresponding ferroalloy plants are provided with manganese ore at the Dzhezdinsky GOK, and chromite ore at the Donskoy GOK. At both GOKs, small waste is generated and accumulated from the enrichment of manganese and chromite ore fractions of less than 5 mm. The accumulated mass of this waste is estimated at millions of tons. And the development of technology for their processing is a very urgent problem.

Development of technology for processing manganese and chrome waste, the primary task is to prepare a mono- slag based on accumulated small waste. These are, first of all, waste from enrichment of manganese and chromite ores and iron-containing waste from metallurgical plants - rolling scale or iron oxide from the etching of the surface of sheet rolling production. These wastes are the basis for the organization of technological processes for the production of ferromanganese and ferrochrome alloys. The chemical compositions of the slag components used for the production of ferromanganese and ferrochromium are presented respectively in Tables 1 and 2, respectively.

Name of				Chen	nical com	position	, %			
materials	Fe	FeO	Mn	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	S	Р	С
Manganese waste	12,3	4,8	28,32	25,27	10,25	1,78	0,55	0,9	0,21	-
Manganese concentrate	11,21	-	40,12	10,5	6,72	1,70	0,42	0,81	0,20	-
Rolling scale	67,65	28,25	0,23	-	-	-	-	0,017	-	-
Charcoal	-	-	-	-	-	-	-	0,37	-	98,0
Note: * - the	rest of the	e ash A <sup>c</sup> =	1,63.							

 
 Table 1. Chemical composition of the slag components for the production of ferromanganese

Table 2 - Chemical composition of the slag components for the production of ferrochromium

Name of					Chemi	ical cor	npositio	n, %				
materials	Fe <sub>общ</sub>	FeO	Fe <sub>2</sub> O <sub>3</sub>	MnO	Cr <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	Р	S	С
Red Iron Oxide	68,6	-	98,0	-	-	-	-	-	-	0,03	0,02	-
Chromite waste	10,30	13,24	-	0,52	52,36	5,72	7,86	0,64	18,35	0,002	0,013	-
Charcoal*	-	-	-	-	-	-	-	-	-	-	0,37	98,0
Note: * - the	rest of th	e ash A <sup>c</sup>	= 1,63.									

In Table 1, manganese concentrate is represented by agglomerated and sorted manganese ore. Therefore, the concentration of manganese reaches 40%, and in waste 28.32% and a high percentage of silica and alumina, which are related to slag-forming rocks. Despite this, it was decided to use waste from the enrichment of manganese ore. To increase the concentration of manganese, experimental work was carried out on the gravitational enrichment of the shredded to 1.0 mm fraction of waste on a special aerodynamic unit.

The regulation of the air flow rate by the criterion of the velocity of entrainment (entrainment) of nonmetallic and metallic particles led to the predominant entrainment of nonmetallic particles of  $SiO_2$  and  $Al_2O_3$ , CaO and, as a result, to an increase in the concentration of manganese oxides in the treated waste. The chemical compositions of enriched manganese wastes in three experiments are presented in Table 3.

According				Chemica	al compos	ition, %	1			
to experiments	Fe	Feo	Mn	SiO <sub>2</sub>	$Al_2O_3$	CaO	MgO	S	Р	output
Experience 1	13,22	5,40	31,90	18,24	7,45	1,65	0,54	0,91	0,22	0,82
Experience 2	14,30	5,55	33,01	15,32	6,22	1,60	0,53	0,88	0,24	0,78
Experience 3	14,45	5,90	35,60	12,25	5,02	1,58	0,52	0,86	0,23	0,65

Table 3. Chemical compositions of samples of enriched manganese wastes

The yield of enriched manganese waste from a unit of mass (5 kg) in three experiments is presented in the last column of the table.

Unlike manganese waste, the concentration of chromium oxide  $Cr_2O_3$  in it did not decrease in the formation of chromite waste, but was at the level of its concentration in the conditioned ore -  $Cr_2O_3 = 52.36\%$ . This constancy of the concentration of  $Cr_2O_3$  in the conditioning ore and waste is due to the fact that  $Cr_2O_3$ oxide is present in the starting ore as the spinelide FeO  $\cdot Cr_2O_3 \cdot MgO$ . Thus, the slag-forming oxides are not in the ore in a free state and are not separately isolated during enrichment. Therefore, manganese waste, taking into account enrichment, is presented in four positions, and chromite waste occupy only one position.

The mono-slag preparation was organized separately for the production of ferromanganese and for obtaining ferrochromium. The bulk of ferroalloys are manganese and chromium, respectively, whose reduction from their oxide compounds is carried out only by solid carbon. Charcoal was used as a carbonaceous reagent.

In the recovery melting of ferroalloys, the process of slag formation is of no small importance. Taking into account the composition of the slag-forming components presented in Tables 1, 2, and 3, it was concluded that it is necessary to introduce another flux in the form of calcined lime with a concentration (CaO) of 92%.

First of all, from the oxide components shown in Tables 1 and 2, the averaged composition of the mixtures of manganese waste + rolling scale and chromite waste + iron oxide was determined.

The averaged chemical mixture is shown in Table 4.

 Table 4 - Average composition of a mixture of manganese waste from rolling scale and chromite waste with iron oxide

Name of				Chemic	al compos	ition, %			
materials	Fe	Cr <sub>2</sub> O <sub>3</sub>	Mn	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	S	Р
Manganese waste	15,62	-	26,63	23,75	9,63	1,67	0,52	0,84	0,197
Enriched waste 1	15,94	-	30,32	17,33	7,08	1,56	0,51	0,86	0,20
Enriched waste 2	16,96	-	31,37	14,55	5,90	1,52	0,50	0,84	0,23
Enriched waste 3	17,10	-	33,83	11,64	4,77	1,50	0,49	0,22	0,22
Chromite waste	13,16	49,68	0,506	5,43	7,46	0,61	17,43	0,012	0,002

Based on the obtained results on the concentration of slag-forming oxides, the flux consumption was determined with respect to  $B = (SiO_2 + Al_2O_3) / (CaO + MgO) = 1.2$ .

The flux consumption for the five items shown in Table 4 was determined and amounted to 0.39, respectively; 0.28; 0.23; 0.18; 0.00 kg / kg oxide batch. As you can see, the consumption of flux for chromite waste is zero, because in its composition a rather high content of the basic oxide MgO. Further, taking into account flux consumption, the average chemical composition of the fluxed charge was established, which is shown in Table 5.

Slag received			(	Chemica	l compos	ition, %			
from waste	Fe	Cr <sub>2</sub> O <sub>3</sub>	Mn	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	S	Р
Manganese waste 1	11,25	-	19,17	17,10	6,93	27,0	0,37	0,60	0,14
Manganese waste 2	12,45	-	23,68	13,53	5,53	21,27	0,40	0,67	0,15
Manganese waste 3	13,79	-	25,50	11,83	4,80	18,43	0,40	0,68	0,18
Manganese waste 4	14,48	-	28,65	9,86	4,04	15,35	0,41	0,18	0,18
Chromite waste	13,16	49,68	0,506	5,43	7,46	0,61	17,43	0,012	0,002

Table 5. Chemical composition of the fluxed charge

Based on the analysis of the composition of the fluxed manganese batch and the strength characteristics of iron, manganese and silicon oxides according to their thermodynamic indices of dissociation elasticities, direct reduction of metals is realized, first iron in the temperature range 600-1000 °C, then manganese in the temperature range 1000-1250 °C and of silicon above 1250 °C. Therefore, it is established that the primary reduced metallic iron is a matrix for the recovery and absorption of manganese and dissolves as its degree of reduction increases.

In accordance with the achieved degrees of reduction of iron, manganese and partly silicon, the costs of carbon, as a reducing agent, per unit of fluxed charge materials have been determined [3]. The consumption coefficients for the four wastes are shown in Table 6.

 Table 6. Expenditure factors of solid carbon in terms of charcoal element-by-element

By element	The consum		ts for the initial was the for the initial was the steel of the second steel (1, 2, 3) in order the second steel (1, 2, 3) in order the second steel (1, 2, 3) in order the second steel (1, 2, 3) in se	
by element	init. waste	1-enriched	2-enriched	3-enriched
	init. wuste	waste	waste	waste
For iron	0,0312	0,0336	0,0364	0,0370
For manganese	0,1051	0,1124	0,1225	0,1321
By silicon	0,006	0,0070	0,0072	0,0075
Total consumption	0,1423	0,1530	0,1661	0,1766

The consumption of charcoal per unit of chromium batch was 0.143 kg/kg.

The introduction of charcoal into the composition of the fluxed oxide batch leads to a change in its composition and the production of a carbon-containing monocity. Taking into account the charcoal consumption at the positions presented in Table 5, the weighted average chemical compositions of the fluxed carbonaceous charge materials were determined, which are mono-viscous and are presented in Table 7.

			<u> </u>	<u>mium c</u>	<u>narge</u>	<u>materia</u>	ais			
Slag received				Che	mical cor	npositior	1, %			
from waste	Fe	Cr <sub>2</sub> O <sub>3</sub>	Mn	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	S	Р	С
Manganese 1	9,86	-	16,70	15,0	6,07	23,65	0,33	0,52	0,12	13,52
Manganese 2	10,81	-	20,56	11,74	4,80	18,46	0,35	0,58	0,13	14,60
Manganese 3	11,83	-	21,88	10,15	4,12	15,81	0,34	0,58	0,15	15,80
Manganese 4	12,32	-	24,38	8,39	3,44	13,06	0,35	0,15	0,15	16,72
Chromic	11,56	43,62	0,44	4,77	6,55	0,54	15,30	0,011	0,002	13,6

 
 Table 7. Chemical composition of carbon-containing manganese and chromium charge materials

The calculated amounts of components were mixed and ground to a fraction of 1.0 mm, as a result of which a dispersed, fluxed and carbonaceous charge was obtained for each position.

The formed composition of the dispersion charge of the fraction  $\leq 1.0$  mm according to the values indicated in Table 7 for all 5 positions was granulated in a pelletizer. A molasses solution was used as a binder. Ore pellet pellets of fraction 10.0-12.0 mm were obtained, which after drying at 400 ° C were loaded into a hermetically sealed refractory cell of 200 g. The cell with the contents was introduced into a tubular electric resistance furnace RHTC 80-230 / 15 Controller B410 preheated to 400 ° C. The reaction chamber was heated at a rate of 10-15 ° C / min to a level of 1000-1150 ° C, at which it was held for 30 minutes. The completion of the direct reduction process at a given temperature was fixed after the release of the gases of the reduction reaction products - CO2 and CO. The resulting metallized pellets were melted in a Tamman furnace at a temperature of 1600 ° C.

After metallization and melting of each mono-charge, samples of iron-manganese and iron-chromium alloys of the following chemical composition were obtained.

Mono-slag order	[C]	[Mn]	[Cr]	[Si]	[S]	[P]	Ост. Fe
Mono-slag 1	0,45	50,0	-	2,25	0,33	0,10	Fe
Mono-slag 2	0,52	51,2	-	2,5	0,35	0,10	Fe
Mono-slag 3	0,48	50,68	-	2,85	0,36	0,12	Fe
Mono-slag 4	0,56	52,38	-	2,74	0,38	0,11	Fe
Chromite Mono-slag	0,58	0,50	59,05	2,35	0,020	0,005	Fe

Table 8. Chemical composition of alloys

Qualitative samples of manganese-chromium-containing alloys are obtained, which are in demand for alloying of converter steels, which after conversion have zero content of alloying components.

The consumption of these manganese alloys for doping converter steel within the concentration of manganese in the steel from 1.5 to 2.0% ranges from 20 kg to 40 kg. Therefore, the content of sulfur and phosphorus in manganese alloys 0.35-0.38% and 0.10-0.12% will not affect the quality of steels during alloying.

The consumption of chromite alloys for alloying converter steel at the outlet within  $[Cr] = 1.5 \div 2.5\%$  consumes its specific consumption per 1 ton of steel within 25-42 kg / ton of steel. The chromite alloy is pure in content of sulfur and phosphorus. Therefore, for doping with this alloy, its unlimited amount can be used.

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# 使用深入的网络流量分析评估防御攻击方法的标准 Criteria for evaluating methods of defense against attacks using deep analysis of network traffic

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本文考虑了评估加密网络流量免受基于使用深度网络流量分析技术的攻击的方法的标准。根据对使用的评估标准的正式表述,提出了一个综合评估所考虑保护方法的多标准方法。

关键词:网络流量深度分析,安全数据传输,多标准评估方法,保护有效性,开销。

Annotation. The article considers the criteria for evaluating the methods of protecting encrypted network traffic from attacks based on the use of deep network traffic analysis technologies. A multicriteria methodology for a comprehensive assessment of the protection methods under consideration is proposed based on a formalized presentation of the evaluation criteria used.

*Keywords*: deep analysis of network traffic, secure data transmission, multicriteria evaluation methodology, protection effectiveness, overheads.

The analysis of network traffic is a set of technologies (algorithms and methods) and their implementations (corresponding software and hardware) that allow the accumulation, processing, classification, monitoring and modification of network packets depending on their content in real time [1].

To date, significant heights have been achieved and the technologies for deep analysis of network traffic (DPI - Deep Packet Inspection) continue to develop. They play one of the central roles in a number of types of means of protecting computer networks from external influences. However, when it comes to the need to transfer network traffic in encrypted form, DPI technologies can, on the contrary, be used to the detriment of information security, since the information obtained by DPI can give the analyst substantial information about the nature and structure of the data transferred in encrypted form. An overview of attacks on encrypted network traffic using DPI technologies was presented, in particular, in the works [2, 3].

At the moment, a number of methods are proposed for imposing additional 174 International Conference

protection on encrypted network traffic, preventing its deep analysis and, thus, countering attacks based on DPI technologies. A survey of such methods is given, in particular, in [4].

The existing methods of counteracting such attacks differ significantly both in terms of protection and overhead costs. At the same time, there is no single methodology for evaluating and comparing these methods, since even the notion of "overhead" is treated in various works devoted to this subject in a very different way. To solve this problem, the author of this article proposed a multicriteria method of comparative evaluation of methods of countering attacks based on a deep analysis of network traffic.

#### Criteria for evaluating existing methods

Methods of countering attacks on protocols and encryption tools based on DPI technology can be evaluated by several different criteria.

The following of the used evaluation criteria can be considered basic:

• effectiveness of counteraction to attacks;

• the degree of increase in the volume of transmitted data relative to useful information;

• resource intensity of the main procedures of the method;

- availability of the preparatory phase and its resource intensity;
- degree of difficulty in implementing the method;

• availability of restrictions on the use of the method and other evaluation criteria.

#### Selection of optimal evaluation criteria

For a comprehensive comparative evaluation of the protection methods under consideration, we apply the weighting coefficient method. The evaluation criteria and the weight coefficients proposed for each criterion are given in Table 1.

Nº	Criterion	Weight coefficient
1	Effectiveness of counteraction to attacks	0,7
2	Full overhead of the method	0,2
3	Degree of universality of the method	0,05
4	Degree of complexity of the method	0,03
5	Availability of the need for method support by various objects of information exchange	0,02

Table 1. Criteria for evaluating protection methods and their weights

The weighting method for evaluating the protection methods being analyzed is applied as follows.

For each *i*-estimated protection method ( $i = 1 \dots X$ , where X is the number of evaluated methods), the final complex evaluation of the  $V_i$  method is calculated in accordance with the following formula:

$$V_i = \sum_{j=1}^5 K_j C_j$$

where:

•  $K_j$  – weight coefficient of the *j*-th characteristic according to Table 1;

•  $C_{ii}$  – numerical value of the *j*-th characteristic of the *i*-th method.

The values of  $C_{ij}$  for each evaluation criterion are preliminarily normalized by the principles described below, as a result each indicator is limited to the following range of possible values:  $0 \le C_{ij} \le 1$ .

#### Criterion of effectiveness of the method of protection

The criterion of effectiveness of counteraction to the method of protection for the attacks on encrypted traffic should be the main criterion for evaluating defense methods, while all other criteria are less important. Therefore, this criterion is assigned the maximum weighting factor.

The value of the characteristic C<sub>i1</sub> is formed as follows:

$$C_{i1} = 1 - Rs_i/Ra,$$

where:

•  $Rs_i$  – the number of successful attacks made using the *i-th* counteraction method;

Ra – total number of attempted attacks.

Note that for the correctness of the comparative evaluation of methods, the number of Ra attacks must be identical for each of the protection methods being analyzed.

Thus, the value of  $C_{il}$  is the ratio of the reflected attempts to attack with the help of the estimated method to the total number of attacks, that is, it unequivocally reflects the degree of effectiveness of the method of protection.

# Criterion of full overhead costs of the method of protection

The full overhead of any method of protection is a complex value. Full overhead may include the following characteristics:

• Increase in the volume of transmitted data;

• Computational resources required during the work of the method;

• the computational resources required to complete the preparatory phase of

the method;

• the degree of universality of the preparatory phase of the method, reflecting the possibility of reusing its results;

• resources of operational and non-volatile memory required for storing data used during the operation of the method.

These characteristics have a different effect on the overall overhead costs of the method. Therefore, to calculate the total overhead, you can also apply the weighting method. The characteristics considered in the indicator of the general overhead costs, and proposed to take into account each of the characteristics of the weight coefficients are listed in Table 2.

Table 2. Characteristics of overheads and their weights

№	Characteristic	Weight coefficient
1	Relative increase in the amount of data transmitted	0,3
2	Computational resources required in the course of the method operation	0,3
3	The computational resources required for the preparatory phase of the method	0,2
4	The degree of universality of the preparatory phase	0,1
5	The required amount of RAM	0,05
6	Required volume of non-volatile memory	0,05

The value of the indicator  $C_{i2}$ , reflecting the general overheads of the method being analyzed, is calculated using the data listed in Table 2 weights as follows:

$$C_{i2} = \sum_{k=1}^{6} K_{2k} C_{i2k}$$

where:

•  $K_{2k}$  – weight coefficient of the *k-th* characteristic relating to overheads, according to Table 2;

•  $C_{_{i2k}}$  – numerical value of the *k-th* characteristic of overhead costs of the *i-th* method.

The values of  $C_{i2k}$  are the normalized values of the indicators corresponding to the specific characteristics, the calculation of which is carried out in the manner described below,  $0 \le C_{i2k} \le 1$ .

For all characteristics, except for the characteristic reflecting the degree of universality of the preparatory stage, the indicator of the characteristic  $C_{i2k}$  is calculated by the following formula:

$$C_{i2k} = 1 - H_{i2k} / Hmax_{2k},$$
 (1)

where:

•  $Hmax_{2k}$  - the maximum among the methods considered is the value of the 国际会议 177

corresponding characteristic, expressed in the commonly used units of measurement (for example, in bytes for operational and nonvolatile memory);

•  $H_{i2k}$  – the value of the *k-th* characteristic for the *i-th* evaluated method, expressed in the same units of measurement.

All overhead costs of the estimated protection method can be conditionally divided into the following two categories:

1. Overhead costs arising directly in the process of implementing protective measures provided by the method (the so-called online costs); to this category of overheads are:

• relative increase in the amount of data transferred;

- Computational resources required during the work of the method;
- the required amount of RAM;
- Required volume of non-volatile memory.
- 2. The overhead costs of the preparatory phase (offline-costs).

Overhead costs of the first of these categories can be considered the most significant, since in the process of protection-based transformations there are the most stringent restrictions on the overall speed of operations, the processor resources used, the required RAM, and other.

In contrast, the preparatory phase calculations can be performed in advance, and there are no explicit limitations on the computing resources used (including, for example, supercomputer equipment, a computational cluster, calculations can be performed on some equipment in the background or during periods of idle time and etc.).

Therefore, for online costs, a larger total factor of 0.7 is applied, the largest part of which (0.6) is equally divided between the two most important characteristics of this category because of their approximate equivalence.

The resources of the required operational and nonvolatile memory can be considered significantly less important, because the constant use of both types of memory is constantly cheaper, computer devices and network equipment are equipped with ever larger volumes of non-volatile and operational memory, so the remaining part of the overhead factor is online 0,1) is divided equally between the two given types of memory, also because of their approximate equivalence.

At the same time, for the overhead costs of the preparatory phase, a total weight coefficient of 0.3 is applied, reflecting the lesser importance of this category of overhead costs.

The degree of universality of the preparatory stage is estimated as 0, if the preparatory stage is not universal, and as 1, if it can be executed only once (the value 1 is assigned to this parameter also if the preparatory stage is not required). Reasonable intermediate values may be used.

# Other criteria

The numerical value of the characteristics corresponding to the other evaluation criteria (the degree of universality of the method of protection, the degree of its complexity and the need to support the method of protection by various objects of information exchange) can be calculated from a formula similar to formula (1), which was previously described for characteristics of to the overhead costs of the method, namely:

•  $C_{ij} = 1 - H_{ij}/Hmax_{j}$ , j OHmax<sub>j</sub> – the maximum among the methods considered is the value of the corresponding characteristic;

 $H_{ii}$  – value of the *j*-th characteristic for the *i*-th estimated method.

At the same time, these values can easily be determined to calculate indicators corresponding to the degree of universality of the protection method and the need for its support by various information exchange objects, since in both cases the values of  $H_{maxi}$  and  $H_{ii}$  for each method can be easily determined.

In contrast, an assessment of the degree of complexity of security methods can be expressed, for example, in elementary operations of a programming language taken as a standard, per unit of data sent (for example, a packet, which looks more preferable to using a unit reflecting the amount of data, since the operations of the protection methods under consideration are performed on outgoing data packets without direct correlation with their sizes).

In this case, the precise definition of the maximum number of operations and the number of operations for each of the evaluated methods can be significantly hampered and may require the mocking of some of the transformations of the evaluated methods.

To successfully apply the protection method, it is also very important that the method does not require modification of existing network protocols and protocols that protect the transmitted data, since in this case its implementation will not require changes to either the network equipment or the software that implements the network stack protocols. In particular, if modifications to the TCP / IP protocol stack are required at the application level, it is only necessary to make changes to the transmitting and, perhaps, receiving application-level application software of the operating system. That is, in this case, rather local and relatively easily feasible (in comparison with the hardware level and core OS level), modifications are required. Therefore, any method of protection against attacks based on DPI technologies, claiming the breadth of application and implementation in various security systems, should be based on open standards for information exchange and protection of information transmitted over computer networks, or at least should not conflict with them [5].

#### Conclusion

In this paper, for the first time, a multicriteria methodology is proposed for a comparative evaluation of methods for protecting encrypted network traffic from attacks based on the use of DPI technologies. The evaluation criteria on which the proposed methodology is based are described and the notion of overhead is formalized, which is most often used as the main criterion for evaluating such protection methods.

The methodology can be applied for a comprehensive assessment of existing and prospective methods of protection against attacks of the category under consideration.

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