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

Materials of the International Conference

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参与者的英文报告

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

Authors are responsible for the accuracy of cited publications, facts, figures, quotations, statistics, proper names and other information.

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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 56 authors from 7 countries (China, Russia, Uzbekistan, Kazakhstan, Azerbaijan, Tajikistan, Kyrgyzstan).

This conference was a result of the serious interest of the world academic community, the state authorities of China and the Chinese Communist Party to preserve and strengthen international cooperation in the field of science. 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 this conference will be useful to a wide range of readers. It will help to consider issues, that would interest the public, under a new point of view. It will also allow to find contacts among scientists of common interests.

Fan Fukuan,
Chairman of the organizing committee of the conference
"Scientific research of the SCO countries: synergy and integration"
Full Professor, Doctor of Economic 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”

概念声誉，渔业综合体（RCM），图像，RCM图像的内容分析
CONTENT ANALYSIS OF CONCEPTS REPUTATION, REPUTATION OF FISHERIES COMPLEX (RCM), IMAGE, IMAGE OF RCM

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注解。 本文介绍了企业的“形象”和“声誉”概念的本质。 本文的主要目的是确定这些概念之间的界限和关系。 在分析科学文献的基础上，考虑了理解“图像”和“声誉”概念的5种主要方法。 已经研究了术语“图像”和“声誉”的词源，已经确定“图像”这个词是理解图像的基础，而声誉是“意见”，“评估”。

关键词：形象，声誉，渔业综合体。

Annotation*. This article presents the nature of the concepts of «image» and «reputation» of an enterprise. The main purpose of the article is to establish the boundaries and the relationship between these concepts. Based on the analysis of the scientific literature, 5 main approaches to the understanding of the concepts of «image» and «reputation» are considered. The etymology of the terms «image» and «reputation» has been studied, it has been established that the word «image» is fundamental in understanding image, and reputation is «opinion», «assessment».*

Keywords*: image, reputation, fishery complex.*

Introduction and urgency of the problem

World scientists of our time call our time the «age of information». Millions of companies get information for the informational data; because of the information, conflicts and wars constantly occur.

Information management and the concepts of «image and reputation» are closely linked, the effectiveness of an enterprise or a person depends on reputation, and the image directly determines the possibilities of expanding a business or developing a person, his career growth.

Recently, there has been a tendency of many states to create a large number of laws on reputation and image.

In the conditions of tough market relations and fierce competition, one of the key factors for the success of an enterprise is the creation of its positive image. However, the term «reputation» of an enterprise is widely used both in scientific literature and in practice along with the term «image». These two concepts are often identified with each other.

But with all this there is no clear understanding of the nature of the concept of image, which significantly complicates the work on its creation and improvement. In connection with this circumstance, the clarification of the content of the concepts «image» and «reputation», the drawing of a clear boundary between them now seems to be a very urgent task.

In the world of modern business, image and business reputation make up the appearance of any organization.

It should be understood that the identification of the concepts of «image» and «business reputation» of an enterprise is a very controversial position.

So, the topic of determining the relationship between the two considered concepts, their content is very relevant in modern conditions and is considered in the submitted article.

Purpose, objectives and scientific novelty. The scientific novelty consists in the fact that so far in the scientific literature there is no clear understanding of the peculiarities and differences of the concepts «image» and «business reputation», which makes it difficult to create and improve them.

The purpose of the article is to clarify the essence of the concepts of «image» and «reputation» of an organization, as well as to define the framework of the relationship between them.

The objectives of the article are to examine the modern understanding of the concepts of «image» and «reputation», to study the etymology of words, to identify characteristic features that distinguish them, and the most correct approach to the correlation of these concepts determined as a result of our research.

According to the results of the analysis of literary sources, identified the following to the understanding of the concepts of «reputation» and «image».

1) The concepts of «image» and «reputation» are, in fact, synonymous. Thus, N. V. Popova reveals the concept of image as «the established image of a firm, reputation — as the opinion of the general public about prestige» [9, p. 64]; Krasulya S. in work [7] says that «the company's reputation, in other words, its image, is determined as one of the main factors contributing to the victory or defeat in business and public life»;

2) The concepts of «image» and «reputation» cannot be synonymous, and relate as follows: - image is a component of reputation. Supporters of this approach are, for example, Saginova O., Skorobogatykh I., Gaft V. They indicate that the

corporation’s reputation contains such concepts as identification, values, image; - reputation is a component of image.

Note that in the vast majority of the above sources, reputation is defined as part of the indicators that are used in assessing the business image of an enterprise (the business image is considered by the authors as a type of enterprise image in its assessment by business partners); - Reputation is a consequence of the image.

Researchers of the problem Tatarinova N.V. [11], Rogaleva N.L. [10] also believe so. Thus, N.L. Rogaleva writes that “prestige” and “reputation” basically have an image formation, and the image itself is described as an image that has an emotional and psychological impact” [10]. N.V. Tatarinova expresses the opinion that reputation is the result of an image, and represents an opinion that has developed in people's minds, their reaction to an object [11]. They point to the fact that the word “image” is fundamental in defining an image, and in the concept of reputation - “assessment”, “opinion”.

Adherents of this concept often exemplify a pyramid, which demonstrates in a vivid way how exactly the image is “transformed” into a reputation (Fig.); - image and reconfiguration correlate with each other as form and content. I. Vazhenina, for example, expresses the opinion that image is a mask, and reputation is something that hides behind it [3, p. 138]. A. N. Chumikov defines an image as a declared (ideal) position, that is, one that “a person or organization planned and intends to promote to target groups”, and a reputation as perceived by the audience (real) position, "dry residue" image [6, p. 77].

The term "image" is derived from the English word "image", translated as "exposition", " depiction", "picture", "appearance", "presentation". It is used primarily in the sense of "image". In English, this word came from the Latin language, where the word “imago” exists, which means such concepts as “representation”, “mental image”, “image”, “appearance”.

In the dictionary of foreign words we find such an interpretation of the image: “formed by purpose (literature, media, etc.) the image of any object, person, phenomenon, which is intended to have on anyone emotional and psychological impact in order to popularize, advertise etc.". In turn, in a psychological dictionary, an image is an “emotionally colored image of something or someone that has developed in the mass consciousness and has the character of a stereotype” [1].

So, mainly image is an picture. The explanatory dictionary of Efremova, T. F., gives us the definition of an image as appearance, form; “That which is dreamed, seems, seed in imagination”; “A copy, a duplicate, an imprint in the consciousness of the phenomena of objective reality” [5].

Conclusion: image as an appearance has the following characteristics:

· it is the result of the reflection of objects and phenomena in the mind of man;

· its essence is subjective nature, since it depends on human characteristics that perceive objects and phenomena. Creating an image is a definite goal, that is, it is formed and acquired, but not innate.

Regarding the target orientation of the impact of the image, it is important that

the purpose and task of the image is to attract and retain existing customers (the sixth sign of difference).

The term "reputation" of French origin - "renommee", which translates as "popularity", "glory" and goes back to the Latin word "reputatio". "Reputatio" in Latin means "reasoning", "thinking" [5].

The explanatory dictionary Efremova T. F. tells us: reputation is "public opinion that has developed about something or about someone based on its strengths, weaknesses, qualities, etc." [3]. In short, reputation is a specific opinion, assessment. The judgment about a company in certain groups is formed exclusively with practical interaction with it (the first sign of difference). That is, the reputation is formed both subjectively and objectively.

The consequence of this is the fact that the reputation has the ability to reflect only the actual characteristics of the organization, and this does not always show and determine the image (the third sign of difference).

Reputation is objective, as it is based on concrete and real facts and practical social interaction (the fifth difference). Here it is similar to the image, and this similarity is that the goal and the main task of reputation is also to attract and retain customers [6].

Interesting judgment, in which the reputation derives from the image. The fact that the formation of the image of an enterprise takes place earlier than the formation of its reputation is obvious, because when entering the market, the company positions itself from a certain point of view.

In addition, the image is formed in the minds of different groups of consumers without interaction with the organization, the reputation is formed differently.

And the reputation, as we have already considered above, as a result of how the image was formed is not quite a correct correlation.

We list the factors affecting the image and reputation of the company.

To establish the factors influencing the level of image and reputation, it is necessary to base on the opinions, expectations and estimates of a specific group of target audience, since they directly depend on various criteria.

Factors that enhance the image and reputation of the company in the eyes of consumers:

The reputation and image of the company are enhanced if consumers considered the product or service of high quality;

Consumers evaluate the company's performance better if the price and quality are good, beneficial for them.

For business partners, the following factors are considered to be the most significant and decisive criteria for assessing reputation and image:

Integrity of the name of the company, integrity and honesty in business relations with partners;

High profitability of the company, constant profit growth;

The presence of a network of business partners, which includes sponsors, investors or dealers;

The reputation and image of the organization also depend on the competence of employees.

The results of a comparative analysis of the content of the concepts “image” and “reputation” of an enterprise are presented in table 1 [6]

Fishery plays a major role in the economy of the Kamchatka Territory, while forming a large part of GDP, providing the population with jobs. The most powerful tool for enhancing the reputation of the fishery complex is improving its image, which, as we found out, is often a concrete image that reflects the conditions of life and business, potential and opportunities.

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Image components characterize the image of the organization, determine its integral structure and role in shaping the market in a particular segment.

Positive image consists of two components. These are external and internal components. They form, respectively, the external and internal positive image of the organization (Table 3).

Table 3.- *Components of a positive image of the enterprises of the fisheries complex*

Components of a positive image
Internal image
Staff loyalty
Clear employee awareness of organizational goals and strategies
Comfortable working environment
Employee Promotion
Positive psychological climate
Compliance with corporate ethics
Taking care of labor veterans
External image
Company fame
Strategy to improve product quality
Flexible pricing policy
Quality assurance of goods sold
Form style
Sales promotion

The process of forming a positive image of the enterprises of the fisheries complex is based on the subjects: employees, contractors, society, consumers. They create an image of the organization that will provide a significant competitive advantage of the enterprise.

Taim way, the article discusses the content of the concepts of "image" and "reputation" of the enterprise, analyzes the main opinions regarding their relationship.

Summarizing the above, we note that reputation and image are correlated as form and content. Image is an appearance of an enterprise that is formed purposefully in the co-knowledge of target groups on the basis of the components of a marketing complex to achieve
set goals by attracting and retaining customer base. In turn, reputation is the objective opinion of consumers about the activities of an organization that has been established, confirmed by practical interaction. Common signs of the concepts and terms considered are the direction of influence and the purpose of its formation.

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集群方法对渔业发展的优势
ADVANTAGES OF THE CLUSTER APPROACH TO THE DEVELOPMENT TO FISHERIES

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注解。 本文通过渔业企业与其他行业代表的整合，探讨了解决渔业竞争力问题的方法。 使用集群方法作为提高行业效率的管理工具的主要好处也受到影响。 提请注意渔业部门集群的创建和运作的基本原则。

关键词：集群，渔业综合体，渔业综合体的优势

Annotation*. The article considers an approach to the problem of increasing competitiveness in the fishing industry through the integration of enterprises of the fishing industry and representatives of other industries. The key benefits of using the cluster approach as a management tool to increase the efficiency of the industry are also affected. Attention is drawn to the basic principles of the creation and functioning of the cluster in the fisheries sector.*

Keywords*: clusters, fishery complex, advantages of the fishery complex*

In order to successfully solve the current problem of increasing the competitiveness of the fisheries organizations of the Far East, first of all, the Kamchatka Territory, it is necessary to improve the existing management mechanisms and the use of organizational innovations. Since the raw material share of fish products export remains predominant, and the share of products with a deep degree of processing is insignificant, the discussion of this issue seems to be especially relevant today.

The fisheries organization alone is not able to find a way out of the current situation and independently solve the tasks set by the state.

It means that there is a need to integrate the fishing industry and representatives of other industries.

The experience of international cooperation in this field proves that the use of the cluster approach contributes to significant and sustainable economic growth and competitive advantages. In connection with this circumstance, I consider it expedient to use the elements of the cluster approach to increase the competitiveness of fisheries organizations in Kamchatka Krai.

Aspects of enhancing competitive advantages through the formation of sectoral and intersectoral clusters are considered in the works of foreign scientists M. Porter, E. Dahmen, K. Morgan, L. Metson, V. Feldman, etc. Among the Russian scientists and economists can be identified L.A. Alexandrov, A.A. Voronova, S.V., Kupriyanov, V.P. Tretyak [3, 4, 6, 8].

The founder of the theory of cluster development in economics is M. Porter [1]. He studied the problem of clusters through the study of the competitive positions of enterprises in various regions of the world. At the same time, M. Porter noted that competitiveness has the property of propagation, transmission to the inner circle. Individual enterprises or organizations that have stable positions in any segment on the world market and its significant share reach the highest level of competitiveness, and an effective functioning, relatively high incomes, and wide scale of production are an integral part of competitiveness.

In the aggregate, this allows a particular organization to significantly reduce prices by reducing fixed costs, increase the volume of purchases, introduce the latest developments. As a result, we have increased competitiveness of both suppliers, customers and competitors.

The company strengthens the account of strengthening partners and competitors in the external environment, and thus, through the mutual transfer of the ability to compete with organizations and enterprises, a mutual relationship is established, the so-called “bundle” is formed.

As a result, an integrated structure - "cluster" is formed. It can be concluded that a cluster is an integrated structure uniting a large group of geographically interconnected enterprises and entrepreneurs. They are also interconnected through social and economic goals and mutually ensuring the growth of the competitiveness of the participants.

The considered cluster theory takes place in the works of other scientists. In the works of Swedish scientists, we find judgments that clusters are adapted to the model of national economies. E. Dahmen noted that the competitiveness of national economies is determined by the presence of the development ability of individual sectors of the economy and ensuring the most sustainable development in others [2].

V.Feldman's cluster theory is based on the fact that it studies diversification forms of entrepreneurial activity. He believes that diversification creates certain prerequisites for the formation of clusters, and they are based on innovative activity [3, 4].

The cluster includes the entire production cycle: from the development of science, the extraction or acquisition of industrial raw materials to the release of the final commercial product. The cluster center is most often several large integrator companies. Some competitive relations between cluster members remain, and this is its distinguishing feature from similar integrated structures.

During Soviet times, they also operated on the concepts of "research and production complex" and "territorial production cooperation." Based on the foregoing, we can say that the cluster has something in common with them.

The state has concentrated resources, thus creating regional-territorial industrial complexes. State structures plan and create around the most important centers in the form of industrial production a network of research and development organizations, secondary and higher educational institutions, and distribution infrastructure.

It is assumed that the center of the cluster of the fisheries complex should become the largest fishing organizations that are directly involved in the extraction and processing.

As a rule, large, medium and small fishery enterprises, concentrating around the leading enterprises of the cluster, specializing in the production of single types of products, the implementation of individual operations for the processing of fish and seafood, the extraction of certain types of fish and seafood.

In addition to directly fishing enterprises, organizations that supply fishing equipment, tare, and provide related services become participants in the cluster. The cluster includes various infrastructure links.

Innovations are becoming a component of the cluster on a mandatory basis, so the fishing cluster of the Far East, in particular, the Kamchatka Territory, must necessarily have a structure that develops and recommends the latest types of products and modern technologies for introduction. These can be institutes of the Far East Branch of the Russian Academy of Sciences, the Research Institute of the Far Eastern Federal District, leading universities of the country and the region.

Staffing of the cluster of the fisheries sector can also be carried out by universities - members of the cluster. In this case, the cooperation will certainly be mutually enriching.

The cluster and those organizations that will be included in its composition will determine the priority areas of scientific research, finance them, and the results of scientific research will be implemented in practical application, and this should increase both the competitiveness of the fisheries and the universities. Organization of student practices, improvement of curricula, involvement of specialists from the real sector in the educational process, employment of graduates, etc.

To ensure sustainable sales of cluster products, marketing structures are required to conduct full-scale market research, product promotion, market coverage, and monitoring of competitors in this segment.

It should be particularly noted that the development of the economy of the regions and the industry on the basis of the development of clusters implies initiative and joint efforts of both business structures and administrations of entities. The role played by the administrations of territories and business structures in the development of clusters of the fishing industry is different, but complementary.

The role of power structures should consist in that it supports and initiates the processes of activating the development of clusters. Business, in turn, often has a strong influence on the administration. Therefore, direct participation of the administration in cluster meetings and making decisions regarding their development is especially important.

The regional administrations in service have a very effective way to stimulate clusters. This tool is targeted programs that have a significant impact on the development of the cluster. The authorities can and should carry out active work in enhancing cooperation between various actors of the cluster, as well as engage in activities to resolve pressing issues of development and the work of the cluster between other levels of government [7, p. 32].

For the possibility of implementing the proposal to create a fishing cluster, as in any system capable of self-realization, there are appropriate mechanisms.

Scientific literature has in detail studied and formulated types of economic mechanisms - the production mechanism, the market pricing mechanism, the organizational and economic mechanism, etc.

The table below shows the main distinctive parameters of the cluster approach in comparison with the traditional industry approach.

	Main comparison parameters	**Characteristics of the cluster approach**	**Characteristics of the industry approach**
1.	Principle of formation	Horizontal and vertical integration, optimization of interactions between industries	By technology
2.	Growth Potential	Synergy effects are due to the interaction of heterogeneous elements. The presence of a "key participant" (large enterprises, research centers)	Intensification of production enterprises (industry)
3.	The possibility of enhancing innovation potential	High level of innovation activity achieved due to the possibility of concentration of resources in those cluster elements that determine its innovative potential	Limited due to the inertia of the system of innovation, communication problems

	Main comparison parameters	Characteristics of the cluster approach	Characteristics of the industry approach
4.	Competitiveness of regional products	Can be increased due to the territorial concentration of cluster elements, leading to a decrease in transport and transaction costs	Weakly expressed in connection with the territorial dispersion of enterprises that implement reproduction processes within one industry
5.	Investment attractiveness	Defined by the possibility of integrated use of investment resources	The effect of investment is determined by the capabilities of the investee
6.	Level of communication	Long-term relationships between cluster members that are based on mutually beneficial relationships	Rigid hierarchical structure defined by technological and administrative and managerial relations
7.	Sustainability of the regional system	The ability to adapt to changing environmental conditions due to higher diversification of activities	The highest specialization, leading to a decrease in the ability of regional socio-economic system to adapt

Based on the material studied, we conclude that the organizational and economic mechanism of the functioning of the fishing cluster, which covers the key components of the productive forces and production relations, refers to the interaction of subjects and objects of management.

At the same time, the subjects of the economic mechanism of the fishing cluster are the economic structures that are included in various fields of activity and provide direct fishing production. The objects of this mechanism are the very factors that affect the competitiveness of fish products.

Thus, it is obvious that there is a need to create such an economic mechanism for managing the cluster, which would ensure the most efficient operation of the fishing cluster and would contribute to increasing the competitive advantages of organizations in its composition, and, ultimately, the competitiveness of manufactured fishery products.

The main element of the mechanism are the cluster controls. It is proposed to create a strategic committee for cluster management, structured accordingly, acting on the basis of the most important principles of cluster management, using all the resources at its disposal: administrative, legal, economic, organizational.

To achieve this goal, the need to create a regulatory framework is obvious. And first of all it is necessary to develop a provision on the cluster. In addition, it is necessary to develop other provisions that define the relations of the parties, their functions, etc.; guidelines, standards, regulations, incentive methods, cluster financing.

Next, we consider those basic elements that are proposed for use to form an economic mechanism for managing a cluster.

As you know, the basis of any mechanism for managing the system are the principles of management, which serve as the main and determining rules for the formation and management of the system, including the cluster.

The principle of voluntariness. Decisions on the inclusion of individual companies, organizations and entrepreneurs in the fishing cluster is made in accordance with their statutory provisions. At the same time, it is very important that the integration process in the fishing industry be carried out on the principles of voluntariness, so that it will not ultimately be reduced to the next reform of the fishery enterprises.

The principle of integrity. In the process of creating and operating a fishing cluster, a clearly defined consistency between all links (participants) of the integration process should be spelled out and observed. As material and financial conditions are ensured, the transition from the simplest to the more complex forms of integration is possible.

The principle of "core" - the key enterprise. In the process of creating and promoting a fishing cluster, the question of choosing the main integrator enterprise is sure to arise; its functions can be performed by a stable and financially strong enterprise with preserved production potential. The integrator enterprise, as the head enterprise, is not only ahead of the level of development, but also becomes organizationally and technologically the leading enterprise of the cluster.

The principle of support and assistance from the authorities. The successful functioning of the fishing cluster is mainly due to the nature of the relationship between the heads of enterprises and territorial authorities. As practice has shown, in regions in which integrated state-owned elements are provided with sufficient state material and financial assistance when they start operations, they function more efficiently. It is important that, in this case, the authorities should only contribute to the case within their own competence.

The principle of equal interest of cluster members. All enterprises in the cluster unite and operate on the principles of equality of membership and self-supporting independence and autonomy within their functions and their own shares in total capital.

The strategic committee should determine and supervise the coordinating base organization leading the entire cluster development program.

Cluster partnerships are consolidated by cooperation agreements, managed by the cluster meeting without creating additional structures.

Based on the analysis of the potential of the region, it is possible and expedient to create a fishing cluster in the Kamchatka region.

It seems that the scale of the cluster should help reduce the costs associated with the production and sale of fish and seafood, increase sales profits. This, in turn, will contribute to the growth of economic efficiency of production, increase its profitability.

At the same time, cluster management methods should be somewhat different from those used in individual fisheries organizations.

Effective economic and financial activities of the fishing cluster and its individual sections are possible despite the fact that a number of requirements will be fulfilled: transparency in the financial and economic activities of integration partners; A new approach to financial management and a developed logistic component.

In the existing various forms of cooperation between fishing and fish processing enterprises, the optimal choice of the tax and accounting system, which most fully minimizes tax payments, plays a huge role.

Fishery cluster management has certain stages; at each stage there is its own, definite list of the main tasks that must be solved.

We distinguish three stages of management work:

- first - the creation of a fishing cluster;
- second - the initial period;
- third - current activity.

Passing through each stage and achieving the goals set at the beginning of the stage makes it possible to move to the next level of cluster management. Start of operation logically goes into the current activity.

The main components of the fisheries cluster management process are pricing policies (both for the cluster as a whole and for individual market segments); investment attraction work; innovation policy; personnel policy, marketing.

So, the creation of a fishing cluster in the Kamchatka region will provide an opportunity to solve a whole range of economic, social and other problems of the industry and the region as a whole.

Under the conditions of development and promotion of the cluster, the competitiveness of manufactured fish products will increase due to the provision of factors directly affecting it, and, accordingly, the competitiveness of producers will increase.

This is the key advantage of the cluster approach in the development of the fishing industry of the Kamchatka region.

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变量ΔX3sul存在的三维图分析
ANALYSIS OF 3D GRAPHS OF EXISTENCE OF THE VARIABLE ΔX3SUL

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注解。 本文探讨了计算变量X3并为其构建三维图形的问题。 获得的变量ΔX3sul的值将允许识别变量X3su和X3sl可以存在的极限。

关键词：计算，变量X3su和X3sl，三维图

Annotation. *This article examines the issue of calculating the variable X3 and building 3D graphs for it. The values of the variable ΔX3sul obtained will allow to identify the limits, within which the variables X3su and X3sl can exist.*

Keywords: *calculations, variables X3su and X3sl, 3D graphs*

The author had made the calculations for X3 before, separately for economic shells Vsu and Vsl, which were described in several articles [1, 2]. The discussion below shows how the values of the three variables X1sul, X2sul, X3sul and of the parameter Vsul affect calculations of the variable ΔX3sul and plotting of its 3D graphs. In this case, the values of the variables may remain constant, increase or decrease by a factor of 10. Therefore, an issue of changing ΔX3sul = f(X1sul, X2sul, X3sul, Vsul) is put under examination. Here, the ΔX3sul variable is calculated as the difference between variables X3su and X3sl, i.e. ΔX3sul = X3su – X3sl.

Thus, Figure 1 shows a 3D area ΔX3sul, with the variables having the following values X1sul = X2sul = 1, X3sul = 3..0,65, Vsul = 1..10. As this figure shows, the values of the 3D area diminish by a factor of 4,61 from 2,59 to 0,56. The following figure 2 shows the 3D area ΔX3sul with the variables X1sul = 1, X2sul = Vsul = 1..10, X3sul = 3..64,64, thus increasing by a factor of 21,55.

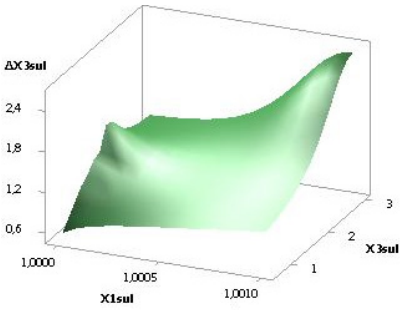

Figure 1.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=X2sul=1, X3sul=3..0,65, Vsul=1..10

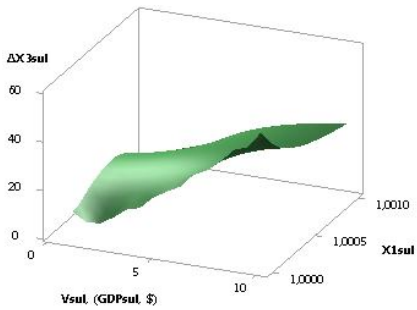

Figure 2.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1, X2sul= Vsul =1..10, X3sul=3..64,64

The following two figures 3 and 4 represent two 3D areas ΔX3sul, with the variables being X1sul = X2sul = Vsul = 1..10, X3sul = 3..646,36 and X1sul = 1..10, X2sul = Vsul = 1, X3sul = 3..30,0 respectively. As seen on the figures, here in two examples the values of the 3D area ΔX3sul increase by factors of 215,45 (Fig. 3) and 10 (Fig. 4).

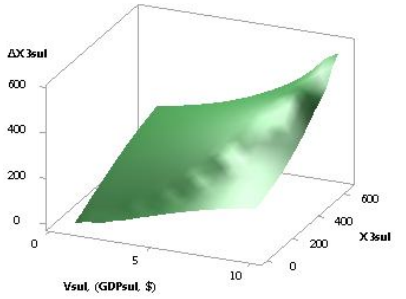

Figure 3.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul= Vsul =1..10, X3sul=3..646,36

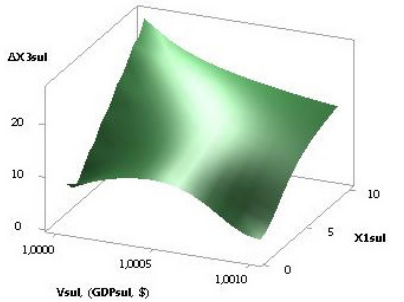

Figure 4.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= 1..10, X2sul=Vsul =1, X3sul=3..30,0

The values calculated for the 3D area ΔX3sul in figure 5 with the variables X1sul = X2sul = 1..10, X3sul = 3..3000,0 Vsul =1 increase by a factor of 1000. In figure 6 the values of the 3D area ΔX3sul with X1sul = Vsul = 1..10, X2sul = 1, X3sul = 3..6,46 also increase but this time by a factor of 2,15.

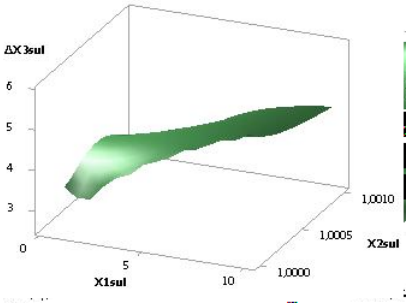

Figure 5.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul=1..10, X3sul=3..3000,0 Vsul =1

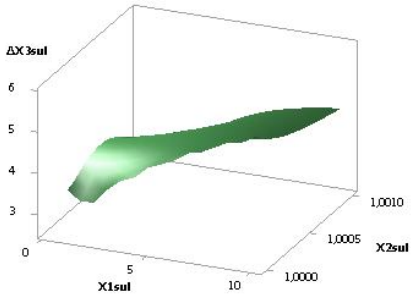

Figure 6.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= Vsul =1..10, X2sul= 1, X3sul = 3..6,46

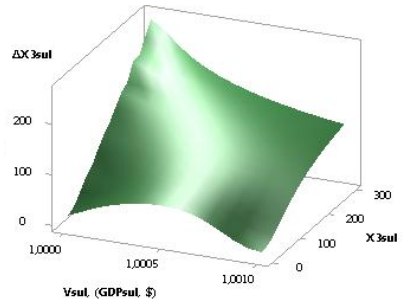

Figure 7.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= Vsul =1,X2sul=1..10,X3sul=3..300,01

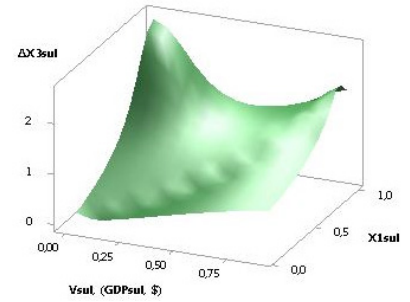

Figure 8.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul= Vsul =1..0,1, X3sul = 3..0,01

Figures 7 and 8 were built with X1sul = Vsul = 1, X2sul = 1..10, X3sul = 3..300.01 and X=V =0.1 respectively. Here on the figure 7 the values of the 3D area increase by a factor of 100, while on the figure 8 decrease by a factor of 319.59.

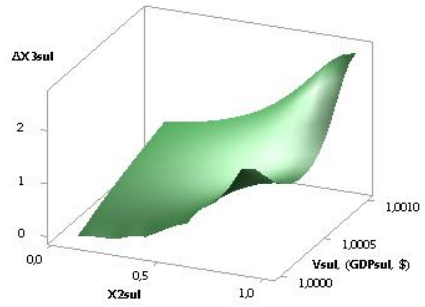

Figure 9.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul= 1..0,1, Vsul =1, X3sul = 3..0,003

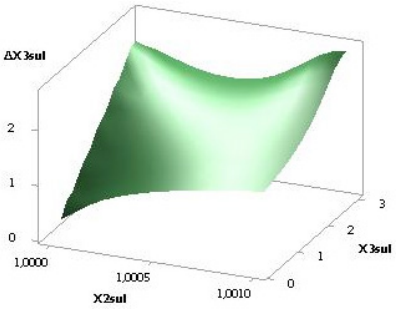

Figure 10.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= 1..0,1, X2sul= Vsul =1, X3sul = 3..0,3

The next two figures 9 and 10 show 3D areas with 1sul = X2sul = 1..0,1, Vsul = 1, X3sul = 3..0,003 and X1sul = 1..0,1, X2sul = Vsul = 1, X3sul = 3..0,3 respectively. On this figure 9 the 3D area increases by a factor of 1000, and on the figure 10 by a factor of 10. Figures 11 and 12 show that the dependencies built of the 3D area with X1sul = X2sul = 1, Vsul = 0,1..1, X3sul = 3..0,1 and X1sul = 1, X2sul = Vsul = 1..0,1, X3sul = 3..0,14 increase by a factor of 4,64 (Fig. 11) and decrease by a factor of 21,41 (Fig. 12).

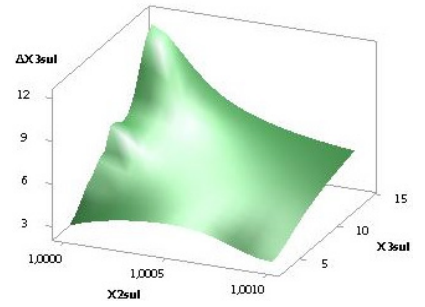

Figure 11.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul=1, Vsul =0,1..1, X3sul = 3..0,1

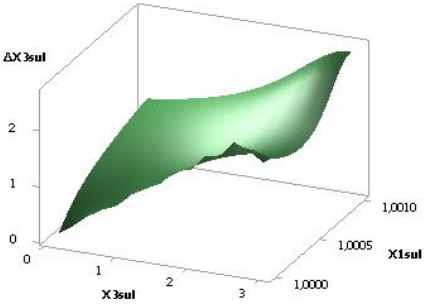

Figure 12.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1, X2sul= Vsul =1..0,1, X3sul = 3..0,14

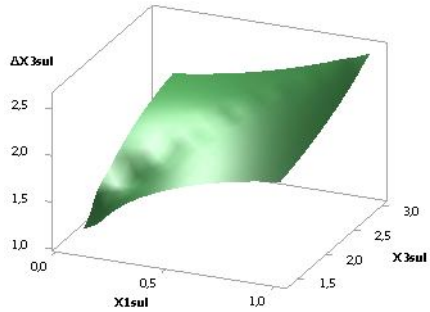

Figure 13.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= Vsul =0,1..1, X2sul=1, X3sul = 3..1,39

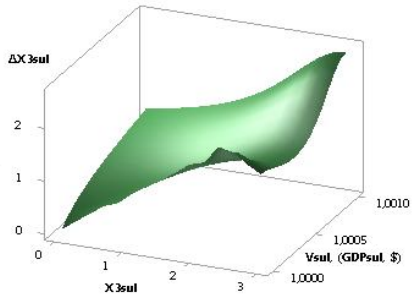

Figure 14.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul =1, X2sul = Vsul = 1..0,1, X3sul= 3..0,03

On the figure 13, the 3D area ΔX3sul with X1sul = Vsul = 0,1..1, X2sul = 1, X3sul = 3..1,39 decreases by a factor of 2,16. Figure 14 shows that the 3D surface ΔX3sul with variables X1sul = 1, X2sul = Vsul = 1..0,1, X3sul = 3..0,03 decreases by a factor of 100.

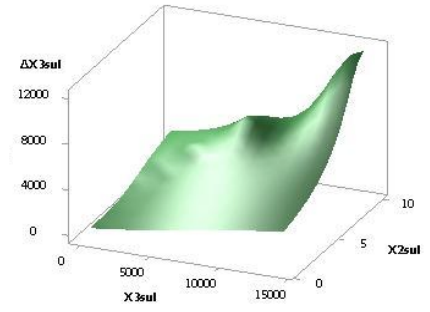

Figure 15.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul= 1..10, Vsul=1..0,1 X3sul= 3..13925,38

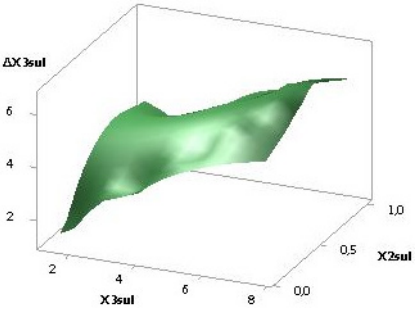

Figure 16.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= 1..10, X2sul= Vsul= 1..0,1, X3sul= 3..7,59

The figure 15 shows the 3D surface ΔX3sul with X1sul = X2sul = 1..10, Vsul = 1..0,1 X3sul = 3..13925,38 increasing by a factor of 4641,86. The 3D surface ΔX3sul, depicted in figure 16, apparently has its maximum 7,59 in the point 5. This 3D surface was plotted with variables X1sul = 1..10, X2sul = Vsul = 1..0,1, X3sul = 3..7,59.

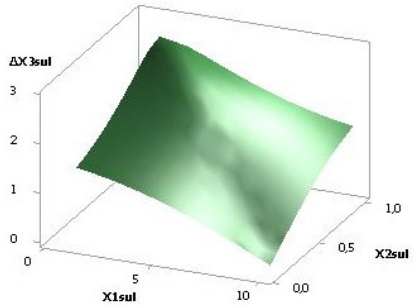

Figure 17.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= Vsul= 1..10, X2sul= 1..0,1, X3sul= 3..3,06

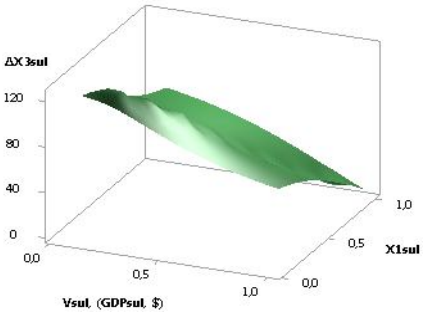

Figure 18.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= Vsul=1..0,1, X2sul= 1..10, X3sul= 3..142,11

The next figure 17 was plotted with variables X1sul = Vsul = 1..10, X2sul = 1..0,1, X3sul = 3..3,06. Here, the 3D surface ΔX3sul also has its maximum 2,65 in the point 2. The following variables X1sul = Vsul =1..0,1, X2sul = 1..10, X3sul = 3..142,11 were used for plotting the figure 18. The 3D surface obtained has the maximum of 122,91.

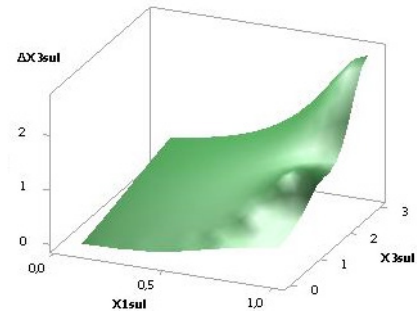

Figure 19.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= X2sul= 1..0,1, X3sul= 3..0,001, Vsul= 1..10

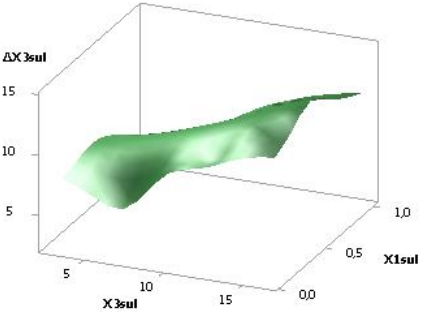

Figure 20.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= 1..0,1, X2sul=Vsul= 1..10, X3sul= 3..16,35

Figure 19 shows the 3D surface with X1sul = X2sul = 1..0,1, X3sul = 3..0,001, Vsul = 1..10, diminishing by a factor of 2842,95. The 3D surface on the figure 20 with variables X1sul = 1..0,1, X2sul = Vsul = 1..10, X3sul = 3..16,35 has its maximum of 14,14 in the point 6.

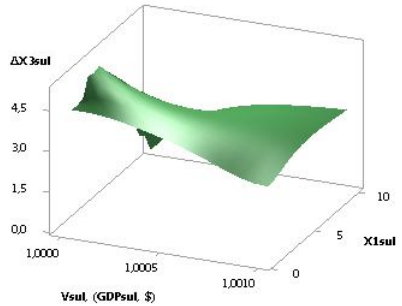

Figure 21.
ΔX3sul = f(X1sul, X2sul,X3su,Vsul) when X1sul=1..10, X2sul=1..0,1, X3sul= 3..5,88, Vsul= 1

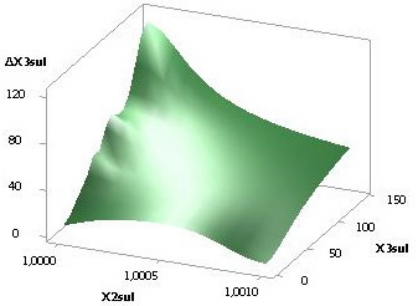

Figure 22.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1..10,X2sul=1, X3sul=3..139,25, Vsul=1..0,1

The 3D surface built on the figure 21 also has its maximum of 5,09 in the point 4 with variables X1sul = 1..10, X2sul = 1..0,1, X3sul = 3..5,88, Vsul = 1. The 3D surface shown in figure 22 increases by a factor of 46,42 with X1sul = 1..10, X2sul = 1, X3sul = 3..139,25, Vsul = 1..0,1.

Figure 23 shows the 3D surface also increasing by a factor of 464,18. This 3D surface was plotted with variables X1sul = 1, X2sul = 1..10, X3sul = 3..1392,54, Vsul = 1..0,1. As seen on the figure 24, the 3D surface built with variables X1sul = 1, X2sul = 1..10, X3sul = 3..0,01, Vsul = 1..0,1 decreases by a factor of 284,29.

Figure 25 shows the 3D surface with X1sul = 1..0,1, X2sul = 1..10, X3sul =3..58,8, Vsul = 1 having its maximum of 50,86 in the point 7. On the last figure 26 there is a 3D surface decreasing by a factor of 50,61 with X1sul = 0,1..1, X2sul = 1, X3sul = 3..0,06, Vsul = 1..10.

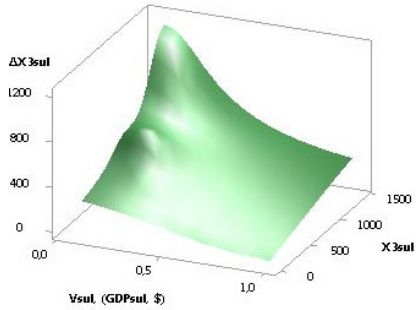

Figure 23.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1, X2sul=1..10, X3sul=3..1392,54, Vsul= 1..0,1

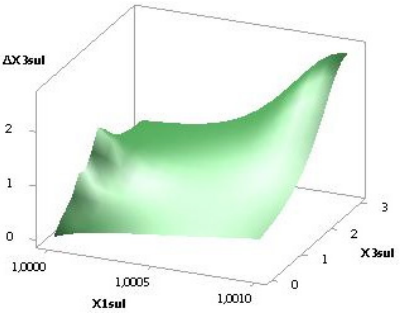

Figure 24.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1,X2sul=1..10,X3sul=3..0,01, Vsul=1..0,1

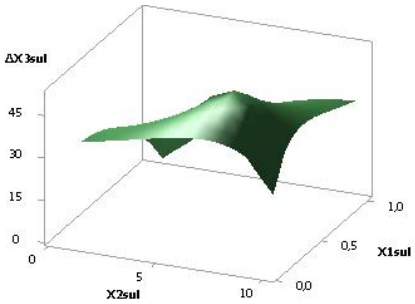

Figure 25.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul=1..0,1,X2sul= 1..10, X3sul=3..58,8, Vsul= 1

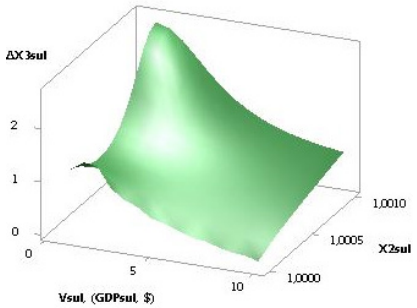

Figure 26.
ΔX3sul = f(X1sul,X2sul,X3su,Vsul) when X1sul= 0,1..1, X2sul=1, X3sul=3..0,06, Vsul =1..10

The calculations of ΔX3sul and the values of the variables are given in the combined table 1, where the parameter of the relations of the final value of $\Delta X3_{sulf}$ to the initial $\Delta X3_{sulb}$ are sorted by a degree of diminution. This allows us to pick maximum or minimum values of the X3 variable, if necessary.

Table 1. *Sorting the relations of $\Delta X3_{sulf} / \Delta X3_{sulb}$ by a degree of diminution*

No. in sequence	$X1_{sul}$, unit	$X2_{sul}$, unit	$X3_{sul}$, unit	V_{sulf}…V_{sulb}, unit.^{3} (GDP_{sulf}…GDP_{sulb}, $)	ΔX3sulf …ΔX3sulb, unit	ΔX3sulf / ΔX3sulb
1.	1…10	1…10	3…13925,38	1…0,1	2,59…12044,18	4641,83
2.	1…10	1…10	3…3000	1	2,59…2594,71	1000,00
3.	1	7…10	3…1392,54	0,4…0,1	2,59…1204,42	*464,18*
4.	1…10	1…10	3…646,36	1…10	2,59…559,04	215,45
5.	1	1…10	3…300,01	1	2,59…259,48	100,00
6.	1…0,2	1…9	3…142,11	1…0,2	2,59…122,91	*47,37*
7.	1…10	1	3…139,25	1…0,1	2,59…120,44	*46,42*
8.	1	1…10	3…64,64	1…10	2,59…55,91	21,55
9.	1…0,1	1…10	3…58,8	1	2,59…50,86	*19,60*
10.	1…10	1	3…30	1	2,59…25,95	10,00
11.	1…0,5	1…6	3…16,35	1…6	2,59…14,14	5,45
12.	1	1	3…13,93	1…0,1	2,59…12,05	4,64

No. in sequence	$X1_{sul}$, unit	$X2_{sul}$, unit	$X3_{sul}$, unit	V_{sulf}…V_{sulb}, unit.[3] (GDP_{sulf}…GDP_{sulb}, $)	ΔX3sulf…ΔX3sulb, unit	ΔX3sulf / ΔX3sulb
13.	1…10	1…0,1	3…7,59	1…0,1	2,59…6,56	2,53
14.	1…10	1	3…6,46	1…10	2,59…5,59	2,15
15.	1…4	1…0,7	3…5,88	1	2,59…5,09	*1,96*
16.	1…2	1…0,9	3…3,06	1…2	2,59…2,65	*1,02*
17.	1	1	3…3	1	2,59…2,59	1,00
18.	0,2…0,1	9…10	142,11…139,25	0,2…0,1	122,91…120,44	*0,98*
19.	1…0,1	1…10	58,80…3	1	50,86…25,95	*0,51*
20.	1…0,1	1	3…1,39	1…0,1	2,59…1,2	0,46
21.	0,5…0,1	6…10	16,35…6,46	6…10	14,14…5,59	*0,40*
22.	1	1	3…0,65	1…10	2,59…0,56	0,22
23.	1…10	1…0,1	7,59…1,39	1…0,1	6,56…1,2	0,18
24.	1…0,1	1	3…0,30	1	2,59…0,26	0,10
25.	1	1…0,1	3…0,14	1…0,1	2,59…0,12	0,05
26.	4…10	0,7…0,1	5,88…0,3	1	5,09…0,26	*0,05*
27.	2…10	0,9…0,1	3,06…0,06	2…10	2,65…0,05	*0,02*
28.	1…0,1	1…10	3…0,06	1…10	2,59…0,05	*0,02*
29.	1	1…0,1	3…0,03	1	2,59…0,03	0,01
30.	1	0,7…0,1	3…0,01	4…10	2,59…0,01	0,004
31.	1…0,1	1…0,1	3…0,01	1…0,1	2,59…0,01	0,003
32.	1…0,1	1…0,1	3…0,003	1	2,59…0,003	0,001
33.	*1…0,1*	*1…0,1*	*3…0,001*	*1…10*	*2,59…0,001*	*0,0004*

Now we transform Table 1 to Table 2 aiming to group the values of relations of variables $\Delta X3_{sulf}/\Delta X3_{sulb}$ depending on the number of variables used. This table will allow us to pick a value $\Delta X3_{sulf}/\Delta X3_{sulb}$ we need due to alternating variables and the parameter V_{sul}, and it shows us within which limits can the variable $\Delta X3_{sul}$ exist.

Table 2. *Statistics of variables for $\Delta X3_{sulf}$ / $\Delta X3_{sulb}$ by a degree of diminution by group*

No. in sequence	$X1_{sul}$, unit	$X2_{sul}$, unit	$X3_{sul}$, unit	V_{sulf}…V_{sulb}, unit^3 (GDP_{sulf}…GDP_{sulb}, $)	ΔX3sulf …ΔX3sulb, unit	ΔX3sulf / ΔX3sulb
2 variables						
1.	1	1…10	3…300,01	1	2,59…259,48	100,00
2.	1…10	1	3…30	1	2,59…25,95	10,00
3.	1…0,5	1…6	3…16,35	1…6	2,59…14,14	5,45
4.	1	1	3…13,93	1…0,1	2,59…12,05	4,64
5.	0,5…0,1	6…10	16,35…6,46	6…10	14,14…5,59	0,40
6.	1	1	3…0,65	1…10	2,59…0,56	0,22
7.	1…0,1	1	3…0,3	1	2,59…0,26	0,10
8.	1	1…0,1	3…0,03	1	2,59…0,03	0,01
3 variables						
9.	1…10	1…10	3…3000	1	2,59…2594,71	1000,00
10.	1	7…10	3…1392,54	0,4…0,1	2,59…1204,42	464,18
11.	1…10	1	3…139,25	1…0,1	2,59…120,44	46,42
12.	1	1…10	3…64,64	1…10	2,59…55,91	21,55
13.	1…0,1	1…10	3…58,80	1	2,59…50,86	19,6
14.	1…10	1	3…6,46	1…10	2,59…5,59	2,15
15.	1…4	1…0,7	3…5,88	1	2,59…5,09	1,96
16.	1…0,1	1…10	58,80…30	1	50,86…25,95	0,51
17.	1…0,1	1	3…1,39	1…0,1	2,59…1,2	0,46
18.	1	1…0,1	3…0,14	1…0,1	2,59…0,12	0,05
19.	4…10	0,7…0,1	5,88…0,3	1	5,09…0,26	0,05
20.	1	0,7…0,1	3…0,01	4…10	2,59…0,01	0,004
21.	1…0,1	1…0,1	3…0,003	1	2,59…0,003	0,001
all the variables						
22.	1…10	1…10	3…13925,38	1…0,1	2,59…12044,18	4641,83
23.	1…10	1…10	3…646,36	1…10	2,59…559,04	215,45
24.	1…0,2	1…9	3…142,11	1…0,2	2,59…122,91	47,37
25.	1…10	1…0,1	3…7,59	1…0,1	2,59…6,56	2,53
26.	1…2	1…0,9	3…3,06	1…2	2,59…2,65	1,02
27.	0,2…0,1	9…10	142,11…139,25	0,2…0,1	122,91…120,44	0,98

No. in sequence	$X1_{sul}$, unit	$X2_{sul}$, unit	$X3_{sul}$, unit	$V_{sulf} \ldots V_{sulb}$, unit ^{3} ($GDP_{sulf} \ldots GDP_{sulb}$, $)	$\Delta X3sulf \ldots \Delta X3sulb$, unit	$\Delta X3sulf / \Delta X3sulb$
28.	1…10	1…0,1	7,59…1,39	1…0,1	6,56…1,2	0,18
29.	1…10	1…0,1	3,06…0,06	1…10	2,65…-0,05	0,02
30.	1…0,1	1…10	3…0,06	1…10	2,59…0,05	0,02
31.	1…0,1	1…0,1	3…0,01	1…0,1	2,59…0,01	0,003
32.	1…0,1	1…0,1	3…0,001	1…10	2,59…0,001	0,0004

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定量评估外部环境因素对组织的影响
QUANTITATIVE EVALUATION OF THE IMPACT OF EXTERNAL ENVIRONMENT FACTORS ON THE ORGANIZATION

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注解。 本文探讨了对环境因素组织影响的定量评估。 首先，介绍了外部环境的定义，确定并列出了直接和间接影响因素。 然后，环境因素被视为威胁和机遇。 从系统方法到组织的角度给出了因素的特征。 为每个因素分配一个定量评估，从中获得对外部环境的综合评估。 提出了一种外部环境的分析模型。 总之，我们引入了在改变环境因素时调整组织发展速度的指标。

关键词：组织，外部环境，环境因素，外部环境影响因素，组织发展速度，发展速度调整。

Annotation. *The article examines the quantitative assessment of the impact on the organization of environmental factors. First, the definition of the external environment is introduced, the factors of direct and indirect impact are determined and listed. Then, environmental factors are considered as threats and opportunities. The characteristic of factors from the point of view of the system approach to the organization is given. Each factor is assigned a quantitative assessment, from which a General, integrated assessment of the external environment is obtained. An analytical model of the external environment is proposed. In conclusion, we introduce indicators that adjust the speed of development of the organization when changing environmental factors.*

Keywords: *organization, external environment, environmental factors, factors of influence of the external environment, the speed of development of the organization, adjustment of the speed of development.*

An organization, like any social and economic system, is developing in the external environment. The external environment is a set of factors that exert an external influence on an organization that is not controlled by it. The external environmentis a source of external resources.

All environmental factors can be divided into factors of direct and indirect effects.

Direct impact factors have a direct impact on the organization. They form a microenvironment or environment of direct impact.

The factors of indirect impact on the organization indirectly, but their influence must be considered when building a strategy. Many factors of indirect effects are combined in the macroenvironment or environment of indirect effects. Consider the main characteristics of environmental factors.

Firstly, all the above factors interact with each other. Combinations of factors can increase the impact on the organization. In addition, the factors of the internal environment neutralizes the action of each other. The interaction of factors may be manifested in their dependence. Thus, the presence of one factor can influence the presence or absence of another.

The second characteristic of the external environment is complexity. The complexity of the factors is manifested in their diversity. The variety of factors due to their combination. A certain set of factors may lead to the emergence of a new, previously unknown type of environmental impact on the organization. It is also not always predictable how the organization as a system reacts to environmental factors. Finally, complexity is manifested in the fact that the degree of influence of each factor may vary depending on the state *s*.

Environmental factors may change over time. Moreover, at some point in time the same factor can have both an accelerating and an accelerating development effect.

Environmental factors have the property of uncertainty (stochasticity). It is primarily caused by the presence of the human factor in the formation of the external environment and the internal environment of the organization.

Environmental factors have a different effect on the organization. On the one hand, such an action is favorable. In this case, the development of the organization is accelerating, it reaches its targets in less time; to achieve the goal requires fewer resources. In this case, factors are considered organizational capabilities.

On the other hand, environmental factors can impede the achievement of the goal. In this case, they are threats.

It is important to note that the cumulative effect of threats and opportunities is subject to a synergistic effect. The simultaneous imposition of capabilities can greatly enhance the net effect. The total negative effect of threats is not equal to their simple sum. Threats and opportunities can offset each other. The situation may improve, worsen, and may become neutral.

Also important is the fact that external factors can be considered dynamic characteristics. Over time, they may change. Threats can be opportunities and vice versa. Also, the same factor depends on the totality of the factors of the internal environment of the organization - its state.

First, we define the main characteristics of the internal environment. Internal is called part of the production environment, limited by the framework of the organization. In management theory, there are five factors of the internal environment f_i: goals, objectives, structure, personnel, technology. Note that the factors of the internal environment are dynamic characteristics, that is, dependent on time. The set of factors of the internal environment determine its integral characteristic - the state *s*. It follows from the above that the state is also a dynamic characteristic,

$$s = s(t). \tag{1}$$

Using function (1), you can determine such organization characteristics as speed and acceleration. The speed of development at a time t_j is defined as the value of the derivative of function (1) over time *t*,

$$v(t_j) = s'(t_j), \tag{2}$$

and the value of the second derivative is acceleration,

$$a(t_j) = s''(t_j). \tag{3}$$

We denote: F_i - the environmental factor affecting the organization. For simplicity, we will consider the development of the organization at discrete points in time. $t_1, t_2, ..., t_m$. We also consider that possible states change discretely: $s_1, s_2, ..., s_n$.

Consider the number $k_{F_i}^{t_j, s_l}$, $i = 1,2,...,m$, $l = 1,2,...,n$. We call it the coefficient of influence. The influence coefficient determines the degree of influence of the environmental factor F_i on the system that is in a state s_l at the moment of time t_j. It can take values from $-\infty$ to $+\infty$, $-\infty < k_{F_i}^{t_j, s_l} < +\infty$.

If $k_{F_i}^{t_j, s_l} < 0$, then factor F_i is considered a threat. In this case, the smaller the value $k_{F_i}^{t_j, s_l}$, the more negative the influence of the factor F_i on the organization.

In case of a positive value of the influence coefficient, $k_{F_i}^{t_j, s_l} > 0$, F_i - opportunity. The level of opportunity is higher, the greater the value of the indicator

Finally, the environmental factor F_i can be considered neutral, having no effect on the organization, if

$$k_{F_i}^{t_j, s_l} = 0.$$

The set of values of the coefficients of influence for all points in time and all possible states forms a matrix

$$F_i = \left(k_{F_i}^{t_j, s_l}\right) \tag{4}$$

dimensions $\dim F_i = m \times n$. Now we find the sum of matrices (4) for all environmental factors. Get the matrix

$$F = \sum_i F_i = \sum_i \left(k_{F_i}^{t_j, s_l}\right) = \left(\sum_i k_{F_i}^{t_j, s_l}\right) = \left(k_F^{t_j, s_l}\right). \quad (5)$$

In it, each element is equal to the sum of the corresponding elements of the matrices (4).

The resulting matrix (5) is an analytical model of the external environment. Each of its elements is the coefficient of environmental influence corresponding to a specific state of the system at a given time.

We introduce the indicators that determine the change in the rate of development of an organization due to the action of environmental factors. Todothis, consider the function

$$f = f\left(k_F^{t_j, s_l}\right). \quad (6)$$

It has properties similar to the properties of the exponential function,

$$f = a^{k_F^{t_j, s_l}}, a > 1. \quad (7)$$

Namely: 1) $f\left(k_F^{t_j, s_l}\right)$ - monotonic all yin creasing function;

2) $0 < f\left(k_F^{t_j, s_l}\right) < +\infty$; 2) $f(-\infty) = 0$; 3) $f(0) = 1$;

4) $f(+\infty) = +\infty$.

Using the method of obtaining the coefficient of environmental influence as the sum of the coefficients of the influence of its factors, we have:

$$f\left(k_F^{t_j, s_l}\right) = f\left(\sum_i k_{F_i}^{t_j, s_l}\right) = \prod_i f\left(k_{F_i}^{t_j, s_l}\right). \quad (8)$$

This means that the value of the function $f\left(k_F^{t_j, s_l}\right)$ corresponding to the external environment of the organization, which is at a time t_j in a state s_l equal to the product of the function values for each of the factors.

So let the organization evolve with speed v_0. Under the influence of environmental factors, the speed changed and became equal v_1. The modified speed is calculated by the formula:

$$v_1 = f\left(k_F^{t_j, s_l}\right) \cdot v_0. \quad (9)$$

At the point -∞ of the function value $f(-\infty) = 0$. From here

$$v_1 = 0 \cdot v_0 = 0.$$

This means that the external environment impedes the development of the organization so much that it becomes insurmountable for it.

With negative values of the influence coefficient, the external environment perceives as a threat. Speed

$$v_1 < v_0.$$

Moreover, the smaller the value of the factor, the less $f\left(k_{F_i}^{t,s}\right)$ and less speed v_1.

As it grows $k_F^{t_j,s_l}$, the negative influence of the external environment on the system decreases, its changed speed v_1 differs less and less from the initial one v_0.

With

$$k_F^{t_j,s_l} = 0$$

function value

$$f\left(k_F^{t_j,s_l}\right) = 1.$$

In this case, the influence of the environment on the organization is not felt,

$$v_1 = v_0,$$

it can be consideredneutral.

Finally at $k_{F_i}^{t,s} > 0$ speed

$$v_1 > v_0.$$

This means that the external environment accelerates the development of the organization, it becomes an opportunity for it. Moreover, the higher the value $k_F^{t_j,s_l}$, the higher the speed v_1 compared to v_0.

The need to take into account the influence of environmental factors in the development of an organization management strategy was realized by economists in the second half of the 20th century. So, E. Elbing wrote: “The external environment of the organization is increasingly becoming a source of problems for modern leaders. In fact, the leaders of the most important organizations for society — business, education, and state — are forced to focus on the rapidly changing environment and its impact on the internal structure of the organization. ” We hope that the results presented in the article will contribute to the development of a quantitative approach to studying the external environment, assessing the degree of influence of environmental factors on the dynamic characteristics of an organization, developing an optimal management strategy when translating an organization from a certain initial state to the intended goal.

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数字经济及其鲜明的特点
DIGITAL ECONOMY AND ITS DISTINCTIVE CHARACTERISTICS

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注解。 现代经济条件鼓励对数字化转型的投资，因为新兴市场正试图增加对技术的需求以刺激进一步增长，而发达市场正在寻找降低成本和创新的新方法。领先科学家的研究得出的结论是，数字经济的一个必要条件是能够实时预测全球市场变化。 重要的是，这些工具可以帮助政府部门的管理人员，公司进行压力测试，着眼于在情景和预测分析的帮助下预测行业或其业务的未来。

关键词：数字经济；数字化；不确定；后工业社会;E-经济；信息和通信技术（ICT）

Annotation*. Modern economic conditions encourage investment in digital transformations, because emerging markets are trying to increase their demand for technology to stimulate further growth, while developed markets are looking for new ways to cut costs and innovate. Studies by leading scientists conclude that one of the imperatives of the digital economy is the ability to anticipate global market shifts in real time. It is important that such tools can help managers of government departments, companies in stress tests with an eye to predicting the future of the industry or their business with the help of scenario and forecast analysis.*

Keywords*: digital economy; Digitization; Uncertainty; Post-industrial society; E-economy; Information and communication technology (ICT)*

In modern conditions it is difficult to ascertain the origins and genesis of the concept of an information-network economy, because at the terminological level, the ideas of «post-industrial development» and «information society» initially had a noticeable socialist color. There is an opinion that these concepts owe their origin to the English socialists, who adhered to the Marxist concept and thus tried to determine the features of the forms of economic power as opposed to the industrial (capitalist) system [1, p. 55].

The term «post-industrial society» was introduced into the scientific circulation by A. Cumaraswamy (1914), the author of studies on the pre-industrial development of Asian countries. Later this term was widely used by A. Penti (1917, 1922), a theorist of English liberal socialism, who even carried it into the headings of his publications, thus denoting «ideal society». A significant contribution to the

development of conceptual foundations was made by prof. Harvard and Columbia Universities USA Daniel Bell, who in 1973 published the famous work «The Future of Post-Industrial Society. Experience of social forecasting» (The coming of post-industrial society: A venture of social forecasting), in which he proposed the logic of «pre-industrial → industrial → post-industrial society». According to the scientist, society reaches the post-industrial stage of development if the fundamentals of its production activities are transformed. Similar views, but much earlier, was followed by another well-known scientist, academician I. Vernadsky, who considered the transition to the noosphere stage to be important stages of the irreversible evolution of the biosphere; development of comprehensive communications systems; creation of a single information system for humanity [1, p. 51].

In the English-language literature, the issue of the digital economy is a separate scientific field. Now most of the research focuses on issues such as the impact of digitalization on the efficiency of the economic system in general and its consequences regarding the sustainable development of the economy, as well as on research in this area at the level of individual countries and regions. Conceptual interpretation of economic categories, in particular, semantics and definitions of the terms «information-network economy», «digital economy», «digitalization», «information society», «digital security», «mediacracy» (from the English mediokratie), «netocracy», «Digital competencies,» and still remain fuzzy. The theoretical substantiation and interpretation of these concepts by some scientists rely solely on the etymology of borrowed foreign, mainly English-language terms. We believe that semantics and definitions require clarification and, in the case, are suitable for describing only theoretically possible future changes in society.

A «digital» (electronic) economy is an economy that exists in a hybrid world. The hybrid world is the result of the merging of the real and virtual worlds, characterized by the ability to carry out all the «vital» actions in the real world through the virtual. The necessary conditions for this process are high efficiency and low cost of information and communication technologies (ICT) and availability of digital infrastructure [2]. The basic principle of this economy is complete as well as individual customer orientation. The essence of the digital economy is the need to implement real products, both in the real world, with material processes and technologies, and in the virtual with the same characteristics, properties and parameters. The importance of the e-economy is difficult to overestimate, since according to various sources, the digital economy requires a change in more than 50% of industries. And this is due to the changes that cause a change or the introduction of new information technologies. A striking example of these business model changes, in addition to a fundamental transformation, increases productivity as a result of eliminating intermediaries, thus optimizing the entire process from production to implementation. World Bank experts have found that with an

increase in the number of high-speed Internet users by 10%, there is the possibility of annual GDP growth of 0.4-14% [3].

The concept of e-economy is widely used in foreign literature; it is the same digital economy based on information technologies, the purpose of which is to develop, sell and introduce electronic goods and services. E-government is a way to implement interaction between government bodies, individuals and legal entities, as well as other economic entities on the basis of the digital economy.

The importance of the e-economy is confirmed by the annual growth of the segment in the country's GDP by almost 20%, in developed countries this figure is about 7%. Within the digital economy, new business opportunities and private employment are rapidly emerging. Investments in most cases invested in the information technology industry provide an opportunity for economic recovery, the creation of new jobs, the emergence of popular services for the population and business, and a reduction in government expenses through the introduction of e-government. Namely, full broadband Internet coverage of the territory of the Russian Federation makes it possible to spread the use of digital services in many areas.

To get the most out of digital dividends, you should understand how new technologies interact with other development factors, which are called «analog add-ons». The following components are considered to be settlement measures [4]:

– regulatory and legal framework, which creates a dynamic business sphere within which enterprises and households use digital technologies to create healthy competition and innovative solutions, reduce costs, increase comfort in working conditions;

- IT skills –

- institutions that promote and assist in the use of information technology.

The effectiveness of international investments in modern conditions is manifested through the speed of digital changes and the high costs of states and companies in research and development in engineering robotics, ICT, informatization, cloud platforms, «big data», nano - and microsystem technologies, renewable energy sources, energy storage mechanisms etc.

Scientists estimate that the global digital economy is coming of age. The Internet has triggered a third wave of capitalism, which is manifested in the transition from consumer behavior to new business models in the global market. Mobility, cloud computing, business analytics and social media form the basis of this shift, which occurs in both developed and developing countries.

The investment opportunities of global IT companies are growing more rapidly than TNCs oriented in traditional sectors of the economy. The rate of return on shares of companies such as Facebook, GOOGL, AMZN and EXPE in 2016 was 19 percent and a positive trend is expected for the current year. The profits of Exchange Trade Funds, exchange-traded funds that invest in certain assets or their

groups, are growing at a fast pace. In fact, they have basic assets (stocks, bonds, commodity futures, foreign exchange, etc.) and issue shares on them. As the value of assets changes, so does the price of the ETF. Ideally, ETF papers fairly accurately replicate changes in the structure of an investment portfolio.

The global ETF market is essentially controlled by three financial structures: BlackRock (iShares), Vanguard and State Street Global Advisors (SPDR ETF). As of mid-2016, these organizations account for 70% of ETF's global assets. No other entity controls more than 4% of total assets. According to Citigroup, total assets managed by these funds in the United States are about $ 2.5 trillion. Since 2000, the growth of assets under management of American ETFs was 2500%, and in 2016, net cash inflows into US ETFs amounted to $ 283 billion. At the same time, the States dominate the global ETF market, accounting for more than 80% of assets under management [5].

However, the ICT sector is a very modest part of the global economy as a whole. According to the World Development Report 2016: Digital Dividendshttp, its share in GDP is about 6 percent in OECD member countries and much less in developing countries [6]. In the United States of America, where 8 of the 14 largest in the world in terms of income of high-tech companies are operating, the ICT sector's contribution to GDP is about 7 percent. The corresponding figure is 12 percent for Ireland - a country where there is no Silicon Valley of its own, but which is attractive to many foreign companies due to its competitive business environment and favorable tax rates.

In Kenya, where the ICT sector is one of the largest in Africa, the share of ICT value added in GDP in 2013 was 3.8 percent.

The World Bank's World Economic Outlook report examines the recent alarming slowdown in investment in emerging and developing countries, which account for a third of global GDP and about 75 percent of the world's population and the world's poor. Investment growth declined, on average, from 10 percent in 2010 to 3.4 percent in 2015, and probably dropped another half a percentage point last year.

The slowdown in investment growth is partly due to their correction in comparison with high pre-crisis levels, but it is also caused by the factors faced by emerging market and developing countries, in particular, low oil prices (for oil-exporting countries), a slowdown in direct foreign investment (for importing commodity countries), and, more generally, the burden of private debt and political risks.

Many believe that the increase in labor productivity in the United States and some countries in Europe, Africa and the Middle East is directly related to the spread of information and telecommunication technologies that have become firmly established in the life of organizations and society.

The economic transformations that have engulfed the countries of Western Eu-

rope over the past decade provide clear evidence of this. By investing in the creation of modern IT infrastructures, Western European states have increased their labor productivity, gained access to new markets and entered a long-term economic development phase. Digital technologies, services and systems are extremely important for social development. They can provide growth and creation of new jobs in all sectors of the economy, starting with the most traditional enterprises and ending with the latest high-tech industries that are emerging today.

One of the first priorities of the European Commission is the removal of regulatory and other barriers to the creation of the Single Digital Market over the coming years. The implementation of this initiative can bring 415 billion euros annually to the EU economy (the amount of which is 14 trillion euros), and also contribute to the creation of hundreds of thousands of new jobs. Digital transformations are felt in all sectors of the global economy. Influenced by global informatization and the use of information technology, companies in almost all sectors of the economy, in particular, telecommunications, entertainment, media, banking, retail and healthcare, have changed their business models and this trend will continue for the next at least five years .

Artificial intelligence, unmanned vehicles, augmented reality - these and other topics in 2017 will be discussed by investors the most. Apple, Facebook, Amazon, Google, Microsoft, Uber, a number of large funds around the world are investing in the research and development of artificial intelligence. Apple has acquired startup Turi Inc. for $ 200 million, which is engaged in development in the field of artificial intelligence. The Turi startup enables developers to create software and services that use a subsection of artificial intelligence, called "machine learning" (aimed at developing methods for constructing algorithms that can learn). Turi also has systems that allow companies to detect fraud, analyze consumer behavior and better identify potential users [5].

According to a Bloomberg source, this deal is the beginning of a struggle between Google, Facebook and Amazon, aimed at gaining an advantage in artificial intelligence, especially in the so-called "pervasive computing", which provide for automatic determination of consumer desires. It should also be noted that over 20 private companies working on the development of artificial intelligence technology have been absorbed by the corporate giants over the past 3 years, including Google, Amazon, Apple, IBM, Yahoo, Facebook, Intel, and more recently Salesforce. At the same time, market experts are seriously concerned about the growing pace of development of artificial intelligence, and their potential negative impact on humanity.

The World Development Report 2016 notes that, against the background of a confident digital revolution, its “analogue additions” do not have time for it - rules that promote market entry and competition, skills that allow workers to access the

new economy, and then profitably use its capabilities, and, finally, the institutions of society. Experts note that in the absence of these "analog add-ons" there is a possibility of a decrease in the inflow of investments in digital technologies.

Under these conditions, the role of the state investment policy of countries on the strategy of digital development is growing, which should correspond to the modern challenges of the global network society. Strategic benchmarks should be much broader than current information and communication technology (ICT) development strategies; political, economic, and institutional conditions should be created for developing technologies that will maximize the return on capital from digital transformations; that is, you need to lay a solid analog foundation that provided would be digital dividends to everyone and everywhere [17]. In order to maximize the potential of the digital revolution, countries need to improve legislation, which ensures competition between companies, bring the skills of workers into line with the requirements of the new economy and ensure the accountability of institutions.

The positive signals on the international capital market include the initiatives of countries on strategic development management based on digital transformations. The intentions to achieve a «revolutionary restructuring of energy systems» were announced by the Austrian government. The plan provides for the attraction of about 40 billion euros of private investment (under favorable framework conditions), which should go into the «green» energy sector - wind, hydro and solar power plants, renewal of networks and the development of energy conservation. The head of the Austrian government also announced the creation of several hundred thousand new jobs by 2020, of which about 40 thousand - thanks to the «greening» of the economy.

Global informatization and development of the digital economy have significantly changed the scale of implementation of investment projects, both local and global. In particular, China intends to invest in the development of the 5G network about 315 billion euros. In accordance with the signed agreement, China and the EU will jointly develop 5 generations of 5G networks. The European Union has already demonstrated a 5G development plan until 2020, for the implementation of which it is planned to allocate 50 billion euros. The agreement says about the timeline for the start of the 5G network deployment and how to start developing it. We are also talking about technological developments and as soon as possible adopt a new network standard. The speed of the transmitted data is more than 10 Gbit per second. The 5G standard is much faster than the LTE (4G) standard. Similar agreements on the creation of a 5G network with previously signed by South Korea and Japan.

The levers of influence in the field of investment in digital technology are shifting to the East. Rich companies in countries that are developing nowadays

are investing heavily in technology, often ahead of their counterparts in developed markets.

There has been an increase in investment in the database storage system, the fastest growing companies will use smart devices to improve their efficiency and productivity, as well as optimize costs. For example, Microsoft has decided to finance «cloud» services in excess of $ 1 billion. According to the company's management, in the near future, these services will not only contribute to the development of scientific and technical progress, but will also help in solving a number of global problems. It is assumed that in the future they will play a significant role in the economic and social spheres of many developed countries. Various non-profit organizations (NPOs), which number more than 70,000, will be connected to the «cloud resources» of the company, as well as research centers of leading universities that conduct effective research in the field of «public interest». According to the company, at the moment, there are more than 900, but their number will only grow in the future. Funds are planned to be allocated in stages, over the next three years.

The business is moving at a hyperspeed pace of innovation. The global market is constantly changing, fueled by high-growth economies and new technologies, has accelerated the rate of transition from product development to customer recall in most commercial activities. Real-time business intelligence and analytics will be in demand not only for faster decision-making, but also to cope with unexpected market risks and to realize sudden opportunities. Traditional economic sectors and public administration will also benefit from the introduction of analytical services based on data sets.

The global digital space is dynamically developing under the influence of the active investment activities of the leading countries of the world and the aggressive policy of the largest IT companies in the world.

Structural changes in the capital market are being observed:

Firstly, the trend of growth in investment in global projects through the formation of consortia and integration groups with the participation of leading countries and countries that are developing intensively.

Secondly, global investment flows are directed both to «mass demand» technologies (Internet games, e-commerce) and to database array storage technologies, which leads to the monopolization of global companies on intellectual capital and digital information space.

Third, the development of global and local digital markets creates favorable prerequisites for countries with a high level of education of the population and the level of informatization of national economies.

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UDC 330

社会改革背景下养老金制度的数字化
DIGITALIZATION OF THE PENSION SYSTEM IN THE CONTEXT OF SOCIAL REFORM

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注解。 在养恤金制度活动中引入数字技术的权宜之计是有根据的，考虑在社会领域使用信息技术的利弊。 建议介绍俄罗斯联邦养恤基金的主要数字平台，其实施将改善保险服务的定位和个性化。

关键词：养老金制度，俄罗斯联邦养恤基金，数字化，社会服务，技术平台。

Annotation*. The expediency of introducing digital technologies in the activities of the pension system is grounded, the advantages and disadvantages of using information technologies in the social sphere are considered. A description of the main digital platforms of the Pension Fund of the Russian Federation, the implementation of which will improve the targeting and personalization of insurance services is suggested.*

Keywords: *Pension systems, Pension Fund of the Russian Federation, digitalization, social services, technological platforms.*

New opportunities opened up by analytics of massive data and other digital technologies can make it possible to implement the principle of targeting and individualization in protection against social risks.

The digital platform of the Pension Fund of Russia accumulates digital social services. On the one hand, it should reduce the agency's transaction costs, and on the other, ensure the active development of the digitization of the domestic economy.

At the federal level, there are many governmental information systems (GIS) that require integration, among them the automated information system (AIS) "Re-

cipients of service recipients", AIS FIU, the federal register of persons with disabilities, the integrated integrated information system "Sotsstrakh", GIS of compulsory medical insurance, etc. Partially, the role of integrating departmental systems is entrusted to a single GIS of social security, but it does not allow combining the work of various organizations and citizens, that is, it cannot be a digital platform.

«The strategic planning documents adopted in the Russian Federation by 2017 provide for measures aimed at stimulating the development of digital technologies and their use in various sectors of the economy» [1]

The digital social security platform will make it possible to realistically assess the quality of life of an elderly or needy person, taking into account not only his income, but also his marital status, his additional medical insurance and participation in a non-state corporate pension system, his presence or lack of benefits, disability etc. Today, financial support is often provided on the basis of overly simplified, not always verified information, and as a result, recipients do not always become those who really need it — it lacks targeting. Moreover, such support is sometimes not received by needy citizens who are embarrassed to prove their need. The digital platform should become a tool for targeted assistance.

The goal of digitalization of the pension system is also to make social services more personalized, taking into account the needs of a specific person and to involve citizens, business and non-governmental organizations in this process. Today, many employers are developing their corporate pension and insurance programs; at the municipal level, various leisure centers for pensioners are being created.

The digital platform is designed to organize a society to create a human-centered social environment. The digital social security platform should also allow the social sphere to become a common cause of the entire population, and not just an expense item of the state.

The environment that is formed as a result of the use of information technologies allows you to work online, directly interact with policyholders, promptly process and securely store incoming documents. A special area of activity in the field of digitalization is the creation and maintenance of Registers of various categories of insured. Registers of pensioners, the register of recipients of maternity capital allows you to quickly and efficiently keep personalized records.

The Pension Fund implements two federal projects: the Federal Register of Disabled (FRD) and the Unified State Social Security Information System (USSSIS).

An example of successful implementation of digital technologies is the implementation of a pilot project for the appointment of pensions to people with disabilities based on FRD data. Within the framework of the project, 82% of pensions are granted on the basis of PFR's own information about persons with disabilities.

It is planned to use FRD data when providing services to the Federal Tax Service for tax benefits for persons with disabilities.

In 2019, in the personal account of a disabled person, a new service will be submitted for applying for assistance to employment services in finding a disabled person. There will also be implemented an electronic application for issuing a sign "disabled". In addition, in the FRD it is planned to add a new sample of information in the context of municipalities, which will allow employment services to more effectively implement employment programs for people with disabilities.

The unified state social security information system has been commissioned since the beginning of 2018. At the moment, it contains information about 52.2 million people and 100.6 million social protection measures assigned to them. The total liabilities of budgets of all levels of payments, information about which is reflected in the USSSIS, amounts to 783 billion rubles. [2]

The Pension Fund of Russia plans to use blockchain technology to track information about employment contracts between employers and employees in order to reduce their costs of storing and maintaining large amounts of data.

Proposals have been prepared for integrating all PFR information systems into a single digital platform. It is also about introducing smart contracts. This new type of contract is made in electronic form and approved by a digital signature by both parties. To obtain a digital signature, a citizen must contact the MFC or any other certifying center (SULARU - and pay a couple of thousand rubles).

PFR accumulates data on tax deductions and insurance premiums of employers on their servers. In the future, all this information will be stored using distributed databases (SULARU - on the same servers, but they will be more). The technology of the blockchain in this case makes it possible to unambiguously fix all the agreements and the necessary documents, and the ability to make edits retroactively is excluded.

The blockchain technology will distribute information about employment contracts between employers and certification centers, saving PFR costs for storing and maintaining large amounts of data (SULARU is either nonsense or, at best, mixing in just one basket - and Big Data and Blockchain). At the same time, citizens will be additionally protected from negligent employers who draw up employment contracts in violation of the law.

The technology of «blockchain» allows you to make a change in the contract / agreement / document unilaterally. Any change is automatically recorded in the computer of the second / third / fourth party under the contract.

Neither the employer nor the employee will be able to independently make changes to it (forged), since entering any comma will be displayed in the second-party computer and in the computer of the supervisory authority.

The blockchain technology is not needed at all to confirm the authenticity of a contract. To do this, sufficiently secure encryption electronic signature. [3]

Smart contracts under the Pension Fund of Russia can be used, they will even be beneficial in terms of the costs of this pension fund itself, but on condition that they are all the same. Since the condition of standardization is obviously not feasible under the labor contracts of all employees, which automatically means that it is impossible to protect the individual conditions of an employment contract, the use of the blockchain to protect citizens from «negligent merchants» is almost impossible.

- On April 26, 2019, the project to create the Information Security Management Center (ISMC) for the Pension Fund of the Russian Federation was completed. The Information Security Management Center is a centralized complex of forces and facilities designed to prevent, detect, respond, manage and investigate information security incidents in the PFR information infrastructure. The main objectives of ISMC are: prediction, detection and neutralization of information security threats;
- ensuring sustainable and uninterrupted functioning of the PFR information systems;
- ensuring compliance with information security requirements;

Increased confidence in PFR due to increased security of information resources of PFR.

The Information Security Management Center provides a solution to the PFR asset inventory tasks; centralized collection and analysis of data on all PFR IS incidents with subsequent visualization of analytical materials and reporting; making decisions and responding to various types of information security incidents in order to minimize damage to the main activities of the PFR; PFR security analysis; increase user awareness, and interaction with third-party IS monitoring centers.

The ISMC promptly identifies information security incidents One or more unexpected or undesirable events in the IS domain, with which there is a significant likelihood that the PFR processes are compromised and information security is threatened, and responds to them in the PFR information infrastructure. The implemented IS management processes ensure a continuous increase in the level of security of information systems and enhancement of the IS culture in general.

The technological basis of ISMC is built on modern solutions:

- information security incident management (IRP) platform,
- a system for collecting and correlating security events (SIEM),
- IT asset inventory system,
- visualization and reporting system.
- To ensure the most effective protection of PFR information systems, the entire platform was integrated with existing IT and IS solutions in the system, including technical support and an IT asset inventory system.

The project included hundreds of sources of events and metadata about network interactions from federal state information systems and 85 subjects of the Russian Federation.

According to the law No. 48-FL, starting from April 1, 2019, in Russia the issuance of SNILS cards was canceled. In addition, for the operational registration of information about citizens, all information in the PFR will be transmitted directly from state and municipal bodies, and foreign citizens and stateless persons will be able to register in the Pension Fund accounting system. This will allow them to access the Personal Account, track the payment by the employer of insurance premiums, when receiving state municipal services (registration of benefits, allowances, payments, etc.) will not need to provide any supporting certificates from the Pension Fund. All organizations will be able to obtain the necessary information directly from the PFR through a system of interagency cooperation. [4]

The pension fund was always responsible for data integrity. However, there are disadvantages of digitized society. For subjects of the pension system: non-state pension funds, insurance companies, the introduction of digital technologies has a number of risks: personal data available to insurers may be available to other subjects, which may affect customer confidence. [5]

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来自中国的商业和税务会计进口商品在贸易组织中的特征
FEATURES OF BUSINESS AND TAX ACCOUNTING IMPORT GOODS FROM CHINA IN THE ORGANIZATIONS OF TRADE

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摘要。 在目前的工作中，考虑了货物进口会计组织的一般规定。 中国进口商品增值税（VAT）计算的主要问题在于点亮。 制定了关于改善现代俄罗斯公司从中国进口货物会计的有条不紊的建议。

关键词：商品经营进口核算，税收一般和特殊秩序，服务进口，通过中介进口货物。

Summary. *In the present to work general provisions of the organization of accounting of import of goods are considered. The main problem places of calculation of the Value added tax (VAT) for import goods from China are lit. Methodical recommendations about improvement of accounting of import of goods from China for the modern Russian companies are formulated.*

Keywords: *accounting of import of commodity operations, the general and special order of taxation, import of services, import of goods through the intermediary.*

Today China is the largest global manufacturer and the importer of goods. Many Russian companies carry out delivery of goods from China for the purpose of further resale or for own use. At the same time in questions of the organization of accounting of import of goods from China partly there are many problem aspects.

Considering general provisions of accounting of import of goods, it should be noted that the general interpretation of import of goods is enshrined in the Russian legislation. In particular according to the Federal law of December 8, 2003 No. 164-FZ "About bases of state regulation of the foreign trade activity" (with

changes and additions) [3] (Paragraph 10 of Article 2) import of goods - import of goods to the Russian Federation without obligation about the return export. Entries in registers of accounting on accounts of accounting of assets and obligations which cost is expressed in foreign currency are made by the organization which is carrying out activity both in the territory of the Russian Federation and beyond its limits, in rubles. Exchange differences are reflected in accounting separately from other types of income and expenses of the organization, including financial results from operations with foreign currency. [6].

As bases of accounting of import of goods also Russian legislation formulated a basic position that when forming prime cost of goods the expenses incurred by the taxpayer when importing goods on the territory of the Russian Federation are considered. The actual expenses can be carried to expenses when calculating income tax of the organization. The documents necessary for accounting of import goods according to the Federal law of 06.12.2011 No. 402-FZ "About accounting" [4] (Articles 9) each fact of economic activity has to be subject to registration by primary registration document. For accounting of import operations primary registration documents which existence is necessary at business and tax accounting of import goods are: foreign trade contract with the importer of goods; the bill which is made out by the seller; transport, forwarding documents; insurance documents; the declaration on goods (DT); the bank references confirming payment of customs duty and customs duty; consignment notes, acts of acceptance of inventory items; technical documentation.

In practice of the organization of accounting of import of goods by one of the most problem places there is a question of accounting of taxation of import of goods. Considering an order of taxation of the goods and services imported on the territory of the Russian Federation it should be noted that this question is regulated tax and the customs legislation (the Tax Code of the Russian Federation [1], the Labor Code of the Russian Federation [2]). Within normative documents the mechanism of calculation and payment of the VAT from the cost of import goods can be divided into two main groups which treat the general and special order of taxation conditionally. In particular the special order of taxation is provided when importing goods and services from the countries of the Eurasian Union (Belarus, Kazakhstan, Armenia, Kyrgyzstan). The general order of taxation is accepted for the countries which are not entering into the Eurasian Union including for China.

As the People's Republic of China is not a member of the Eurasian Economic Union, taxation of the VAT when importing from China is carried out in the general order. If the Russian company imports goods from China, then the VAT needs to be paid at customs, together with other customs payments. At the same time VAT amount is for payment calculated by the following formula [16, page 14]:

$$N = (Tamst + Tamposhl + Akts) * St,$$

where Tamst – the customs value of goods documented (on the basis of the customs declaration); Tamposhl – the amount of the customs duty paid when importing goods to the territory of the Russian Federation; Akts – the sum of the paid excise (if from China the excise goods are imported); St – a tax rate.

Today's Russian legislation contains methodical recommendations about the organization of accounting of taxation of import of goods. To define the tax rate applied to import goods from the People's Republic of China it is necessary to address Resolution of the Government of the Russian Federation No. 908 of 31.12.04 [5]. In the document the inventory when which importing it is necessary to apply a preferential rate – 10% is recorded. In particular, treat the list of goods: food (cattle livestock, agricultural bird, fresh meat and meat products, dairy products, eggs, bakery products, fish, seafood); products of baby food and children's goods (toys, goods for children's hygiene, children's furniture, clothes, other); medicines and medical goods within the approved list (a part of medicines are exempted from taxation of the VAT). It is worth paying attention that if the goods imported from China do not belong to the closed list, when calculating a tax it is necessary to apply a rate of 18%.

Covering basics of the organization of accounting of import of goods from China, It should be noted, first of all, that for reflection of the VAT amounts paid by the importer at customs account 68 (the sub-account of "VAT") is used. When charging the VAT it is necessary to reflect conducting: Дт 19 Kt of 68 VAT, at payment at customs – Dt of 68 VAT of Kt 51. The amounts of the customs duties when importing goods from China are reflected on account 76 (the sub-account "The customs duties) [7, page 31].

Separately it is necessary to pay attention to such aspect of the organization of accounting of import of goods from China as import of services. In particular in case the organization from the Russian Federation gets services from the Chinese company (the nonresident of the Russian Federation), at the same time the place of rendering such services is the territory of the Russian Federation, then the Russian company is obliged to add and pay the VAT as the tax agent. The information and consulting services rendered by the Chinese experts in the territory of the Russian Federation and also the trainings and seminars organized by the Chinese companies, but held in Russia can be examples of similar situations.

It is also expedient to consider such aspect as import from China for the natural persons and the organizations using a simplified tax system. The individual entrepreneurs and the companies using the simplified tax system, PSN and single tax on imputed income do not admit payers of the VAT. However in case of import of goods and services in the special mode it is necessary to pay the VAT in the general order. In particular it concerns import of goods and services from China. In this case as well as the organizations and the individual entrepreneurs applying the general system of taxation have to pay to both the organization and individual entrepreneurs applying a simplified tax system the VAT at declaration of goods

from China. At the same time the amount of a tax is defined proceeding from the customs value and the applied tax rate. In case the goods from China are imported by the natural person who is not the individual entrepreneur, then the VAT to the citizen does not need to be paid.

It is worth affecting separately such aspect of the organization of accounting of import of goods from China as import of goods through the intermediary. Often in the Russian practice of the company receive import item not directly from the seller, and through the intermediary. For example, the resident firm of the Russian Federation within the contract with the Chinese seller receives item, but not directly from China, and in transit through Kazakhstan. At the same time not clear is a question of what order of payment of the VAT is provided in this case. According to a position of tax authorities, the fact of transit of import goods does not influence the mechanism of calculation and payment of the VAT [8, page 52]. Anyway, the VAT should be paid when crossing by goods of the customs territory of the Russian Federation on the basis of the customs declaration.

Considering a question of restoration of the VAT and submission of the declaration, It should be noted that the Russian companies importing goods from China having the right to accept the VAT amount to a deduction paid at customs. The following documents act as the basis for restoration of the amount of tax: contract with the Chinese company seller; the invoice exposed by the supplier; customs declaration; the payment documents confirming transfer of a tax when importing goods from China.

Especially It should be noted that for application of tax deduction the Russian import company should submit the tax declaration in the general order (following the results of a quarter). In the declaration it is necessary to include data on the VAT amount paid at customs at submission of the document in bodies of fiscal service – to attach supporting documents. Summing up the results, it is necessary to draw a conclusion that when accounting import operations to the staff of accounting service of the modern Russian companies, it is necessary to have theoretical and methodical knowledge and also concrete practical abilities of the organization of accounting of import of goods from foreign countries, namely to own questions of the general and special order of taxation, specifics of charge of the VAT for import goods. In due time it is necessary to update knowledge and skills of the listed aspects of the organization of accounting of import of goods from China, the prospects of trade with which for Russia only begin to be offered, this front of work should be controlled at the level of the management of the companies.

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餐饮业的创新技术
INNOVATIVE TECHNOLOGIES IN RESTAURANT BUSINESS

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注解。 该主题的相关性在于餐厅服务在现代社会中的特殊作用。

服务市场中发展最快的部门之一是餐饮业，在增长动力方面领先于国民经济的许多部门。 与其他地区一样，这一活动领域需要认真了解国外经验，并密切关注其在哈萨克斯坦餐饮市场的应用前景。

如今，创新是餐饮业的主要引擎之一。 食品质量和服务不再是餐饮业发展的唯一因素。 近年来，创新已经显着改变了餐饮业。 因此，现在为了保持高利润，重要的是要了解餐厅业务的最新创新。

关键词：餐饮业，创新活动，创新过程，科技创新，项目管理，创新。

Annotation. *The relevance of the topic lies in the special role of restaurant services in modern society.*

One of the most rapidly developing sectors of the services market is the restaurant business, which is ahead of many sectors of the national economy in its growth dynamics. Like no other area, this area of activity requires a serious understanding of foreign experience and close attention to the prospects for its use in the restaurant market in Kazakhstan.

Today, innovation is one of the main engines of the restaurant business. Food quality and service are no longer the only factors in the development of the restaurant business. In recent years, innovation has significantly changed the catering industry. Therefore, now in order to maintain high profits, it is important to be aware of the latest innovations in the restaurant business.

Keywords: *restaurant business, innovation activity, innovation process, scientific and technical novelty, project management, innovations.*

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The purpose of the article It is to study the characteristics of the innovation process in the restaurant business and the use of world experience on introduction of new technologies.

To achieve the goal the following tasks:

- To study the theoretical basis of innovation in the restaurant industry.
- Explore the innovative technology used in the restaurant business in foreign countries.
- To analyze and summarize the current state of the domestic restaurant industry, determine the prospects for its development

One of the fastest growing sectors of the services market is the restaurant business, outpacing the dynamics of its growth in many sectors of the economy. More than any other region, this activity requires serious reflection of the world of experience and attention to the prospects for its use in the Kazakhstan market. Therefore, it becomes extremely important to define the role and importance of this type of business in the modern economy, the determination of the dynamics of its development in our country, a comparison of trends in development of this business in the regions of Kazakhstan with a view to making useful in the specific development of restaurant services market innovation.

Innovation - one of the main engines of the restaurant business. Innovations are different: some are useful, since they introduce a revolutionary or evolutionary change; other useless for the consumer, but changing the perception of the product; others do not assume any benefit or affect the perception, but fundamentally reduce the price of the product, packaging or method of its promotion without losing quality. To date, the restaurant business is rapidly introduced innovations such as digital technology, molecular menu, a variety of ways to automate the process of cooking, and others. Thus, now innovation is interpreted as the transformation of the potential scientific and technological progress in a real, embodied in new products and technologies [1].

Innovation project - a comprehensive concept that includes: management by objectives forms of innovation; process of innovation; set of certain documents.

Classification of innovation projects:

- the level of solutions - national, regional, sectoral and individual enterprise;
- the nature of the objectives of the project - the end of achieved results and intermediates associated with the achievement of intermediate results in solving complex problems;
- by type of demand - oriented to the needs of existing or creation of new needs;
- by type of innovation - the creation of a new product, a new method, a new market, a new source of raw materials, the new governance structure;
- over the period of implementation - the long-term (more than 5 years), medium (3 to 5 years), short (less than 3 years).

Innovative design, considered as processes occurring in time, comprising the following steps:

- the formation of an innovative idea - the emergence of innovative ideas, formulation of the ultimate objective, quantitative evaluation of the project on the volume, timing and amount of income, the definition of how to achieve the goals, the definition of the value of sources and forms of investment;

• development of the project - to find solutions to achieve the ultimate goals of the project, a comparative analysis of the various options for achieving the objectives of the project and selection of the most viable for implementation, develop a plan for implementation of the project, the formation of a project team to design if necessary contractual documentation;

• the project - execution of works on realization of the project objectives, monitoring performance schedules and resource consumption, the adjustment of deviations, operational control of the implementation of the project; completion of the project - delivery of project results to the customer and closing contracts [2].

At present, methods of management of innovative projects for the service industries in Qazaqstan is in the process of formation. Even more this assertion

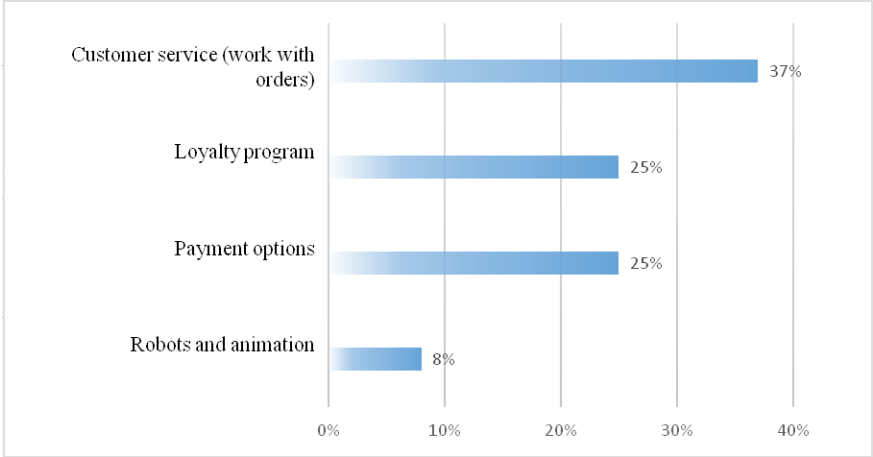

Figure 1 - *The most important technical development trends in 2016-2021*

This diagram 2016-2021, According to Western scholars industry, as well as direct business and restaurateurs of the United States, shows the most important areas and directions in which technology [3] should be developed in the near future .It those areas in which more innovative solutions are expected.

For example, the most obvious innovation, which until recently was considered the absolute innovation - Wi-Fi. - today it is the standard value-added service in all catering establishments. [4]

Small businesses to have to be able to be more competitive activity in the market, using its flexibility and ability to quickly reorient. Currently, it is small businesses are the pioneers of new products and new technologies in various industries.

The main results of the application of new information technologies are:

- increasing competitiveness and the image of a business entity;

- Getting in the long term return on the capital invested today.

For example, today the "Digital Services" is rapidly being introduced in large restaurants and small cafes, and the possibility of conventional meals outside the home is at risk. Gradually, a new trend: "E-restaurant."

Ways to automate orders in a restaurant Electronic can be divided into three main groups.

The first group - it is self-service. The technology consists in the fact that instead of a menu, you bring electronic menu based on a tablet computer. The customer chooses the necessary dishes, drag the cursor of the menu in the Order field, confirm your selection, and ordering information is immediately sent to the place of cooking. The waiter did not take part in the reception of the order.

The second group - the use of service personnel, mobile devices for order entry. Guest places an order, and this order is entered directly into the system as a waiter at the table, after which it is sent electronically to the kitchen.

The third group includes the installation of special technology applications on the phone guests. Leader in the development of business applications for the catering business - Moscow company UCS-announced the development of applications for iOS (Apple iPod and iPad), soon a similar solution will be released for Android. They allow guests to book tables in advance to order meals, and so on. These applications run on delivery, they can also build loyalty system unit (guest will see how many points he has accumulated), and of the most valuable - it is an interactive way to communicate with your regular customers. Kazakhstan has successfully used a variety of applications for smartphones and computers, thereby increasing the number of customers of restaurants and cafes, because the world is changing very quickly,

Table 1-*Volume of services for providing food and beverages (Catering)*
mln. tenge

	2013	2014	2015	2016	2017
The Republic of Kazakhstan	**238 307.7**	**269 320.5**	**321 919.0**	**415 836.9**	**448 261.8**
Akmola	4 723.6	7 203.4	8 392.8	9 729.7	11 572.8
Aktobe	9 907.0	11 051.4	12 619.4	16 044.3	16 942.1
Almaty	9 997.1	11 410.7	11 473.2	11 024.6	10 887.7
Atyrau	21 048.4	22 951.1	26 107.1	41 808.0	59 926.2
West Kazakhstan	11 345.4	10 734.4	15 315.2	20 464.8	18 873.8
Zhambyl	5 819.0	6 621.4	7 176.1	8 357.4	8 753.6
Karaganda	13 002.0	14 578.1	16 604.5	17 240.8	19 823.0
Kostanay	5 130.2	5 585.1	6 200.0	7 669.6	8 671.4
Kyzylorda	11 934.9	12 932.4	11 253.0	10 813.8	12 254.9
Mangistau	18 843.8	23 104.3	22 696.9	22 887.1	21 133.7
South Kazakhstan	18 671.4	22 565.9	26 488.3	28 785.6	29 578.2
Pavlodar	7 202.9	8 618.9	12 090.2	9 623.5	8 341.0
North Kazakhstan	3 905.9	4 487.7	3 571.9	4 110.0	4 593.4
East Kazakhstan	19 652.8	19 808.1	19 576.7	19 176.2	16 121.7
Astana	24 397.9	30 673.4	41 847.5	56 724.1	65 164.8
Almaty city	52 725.4	56 994.1	80 506.2	131 377.3	135 623.4

Based on the data in Table 1, we can observe an increasing trend in services for the provision of food and beverages. [5]

Thus, in comparison with 2013 year, the volume of services in catering for Kazakhstan as a whole grew by 1.8 times. If you look at the figure of Astana in 2.67 times, and on g.Almaty- 2.5 times!

If we look at the areas of greatest growth in the volume of services catering nablyudaetsya in Atyrau region and on imenshy in East Kazakhstan.

In our opinion, this is due to increasing demand in the market of catering services. Major factors of such growth are as follows:

- an increase in the population of material income and as a consequence -increase purchasing power;
- changing food culture, life-style;
- the emergence of product innovations - new types of drinks, meals, changes in biochemical composition of the products;
- technological and technical innovation;
- reduction of uncertainty and risk in the business;
- continuing and compelling human need for food and fellowship

In Almaty, the market is saturated with restaurants, revealing a trend of rapid development of the network concept of the restaurant business. The market has become attractive for large western companies, the advantage of which - in the work of established technologies and well-delivered control. Purposeful move-

ment toward national restaurateur competent approach to business management is the key to competitiveness and prosperity.

One of the main restaurant market changes is the increased promotion of the restaurant as the objects of the market as a whole, his visit is now available and the middle class. Today, people are more likely to go to a restaurant is not only about special events, but also simply relax, dine, so we can say the restaurant market creates the consumer himself.

So, we can draw the following conclusion:

The development of the restaurant market in Kazakhstan reflects not only its rapid growth, but also the evolutionary change of the status of the restaurant business: from the "fashionable hobby" bohemians to modern and highly profitable venture. The specifics of the restaurant business as a service industry, requires at the latest (innovative) technologies not only improve the quality of life of people, nice and tasty cooked food, but also the well-built customer relations, competent marketing policy and PR-strategy, as well as consideration of the need of commercialization innovative developments.

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理论和方法论方面形成俄罗斯地区经济的创新组成部分
THEORETICAL AND METHODOLOGICAL ASPECTS FORMATION OF THE INNOVATION COMPONENT OF THE ECONOMY IN THE REGIONS OF RUSSIA

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抽象。 本文被认为是构建俄罗斯联邦地区可持续发展的创新组成部分的理论方法论方面。 确定了该国有效创新体系存在的主要问题，为其解决问题提供了可能的解决方法。 通过多年的研究，作者提出在俄罗斯地区建立一个创新体系，同时考虑到其工业，科学，技术和创新能力以及经济发展需求的能力。

关键词：经济创新成分，创新体系，区域创新战略

Abstract. *In this article are considered the theoretical-methodological aspects of building an innovative component of the sustainable development of the regions of the Russian Federation. There are identified the main problems of efficient innovation system in the country, justification possible approaches to their resolution. Drawing on many years of research, the authors propose forming an innovative system in the Russian regions, taking into account the ability of their industrial, scientific, technological and innovative capacity and development needs of their economies.*

Keywords: *innovation component of economy, innovation system, innovation strategy of region.*

An innovative component of the economy is an innovative system of a particular region or country as a whole. The main components of innovative components are:

1) actors of innovation (science organization, businesses that develop and produce innovative products);

2) system prevailing and control to support innovation activities in a country or region (different levels of authorities, foundations, Government and other programs of development of innovational activity);

3) system of training and retraining for the innovation sphere;

4) innovation infrastructure, creating favorable conditions for the activation and development of innovation (innovation centers, technology parks, technopoles, technology platforms, etc.) [1].

However, between the concepts of "innovation system" and "innovative component of sustainable economic growth" there is a substantial difference. The latter can be characterized as qualitative state innovation system capable of socio economic system of the region or the country as a whole the necessary impulses for innovation development effectively. The latter can be characterized as qualitative state innovation system capable of social economic system of the region or the country as a whole the necessary impulses for innovation development effectively.

Now the innovative system or its components in the form of scientific organizations, developing new ideas and technologies, enterprises producing innovative products, various objects of innovation infrastructure in varying degrees represented in almost every regions of the Russian Federation. However, between the concepts of "innovation system" and "innovative component of sustainable economic growth" there are substantial differences. The latter can be characterized as qualitative state innovation system capable of social economic system of the region or the country as a whole the necessary impulses for innovation development effectively. The latter can be characterized as qualitative state innovation system capable of socio economic system of the region or the country as a whole the necessary impulses for innovation development effectively.

Differentiation of Russian regions in terms of development innovation system is very significant. For example, Central Federal District (FD) for understandable reasons outstrips the rest districts by indicators of innovation development. So Central FD superior in cost of technological innovation Volga FD in 1.4 times, Ural FD – in 2.5 times, in 3.2 times – Northwest FD, and in 3.5 times-Siberian FD (table 1).

Table 1

The State of scientific and innovation activity in the Federal districts of the Russian Federation, 2017

Federal districts	The number of employed research and development		The cost of technological innovation		The volume of shipped innovational production	
	тыс. чел.	% to 2000	billion rubles	% to 2000**	billion rubles	% to 2000**
Central	362,5	79,5	457,5	360,1	1112,0	375,8
North-West	94,5	80,9	142,7	312,3	458,8	296,9
South	26,9	74,7*	82,7	442,3*	304,5	1421,6*
North Caucasian	7,2	127,6	9,0	865,3	34,7	2917,9
Volga	104,9	69,9	336,9	379,1	1445,6	424,7
Ural	45,3	89,1	186,3	344,4	507,8	627,1
Siberian	54,0	86,4	131,4	620,1	206,4	683,7
Far Eastern	12,6	88,8	58,6	303,5	89,3	966,3
Russian Federation	**707,9***	**79,4***	**1405,0***	**373,7***	**4167,0**	**445,1***

Created: by collections of Rosstat "Regions of the Russian Federation. Social-economic indicators" for 2018 and 2001 years.

Notes: *- excluding Republic of Crimea and Sevastopol;

** - in comparable prices.

It follows that one of the critical moments of the innovation component of the economy of the region is a required accounting of the condition and characteristics of its innovation system. Otherwise, support innovation in the region will be ineffective or inefficient and not becomes the basis for a serious upgrade and improve the efficiency of the economy.

Another important point is the mandatory binding system innovation to production-technological type of territory. This is due to the fact that the innovation system is part of the overall socio-economic system of the region.

During the formation of the innovation system it is necessary to take account of contemporary trends in the world economy. Today, the task of increasing the economic stability of the region and the country as a whole cannot be solved without recreating a new manufacturing industry with an emphasis on the accelerated formation of the high-tech sector. No coincidence that now in the world we can see gaining popularity theory neoindustrialization of basic industries. In relation to Russia attempts to solve the problem of substitution by circumventing the task of forming a modern high-tech sector and create favorable conditions for the development of science and innovation is doomed to failure in consequence significant technological backwardness our country. Russian industry is neither as human capacity, nor on the availability of technological equipment is not currently able to offer an alternative to imports for most items.

It should also be stressed that the development of the manufacturing industry has the largest multiplicative effect to revitalize other sectors of the economy. Invested in manufacturing $1 leads to an increase in GDP by 1.5 dollars, while investment in other sectors of the economy (except agriculture) result in GDP growth is less than $1 at $1 of costs [2]. In 2016 the share of Russia in the world markets of high technology, amounted to just 0.33% (6.6 billion United States dollars). The share in the total exports of high-tech industrial products Russia also significantly inferior to the technologically leading countries of the world (table 2).

In this context, the problem of ensuring economic stability should start with the modernization of the economy as a whole, improvement of its structure and management mechanisms [3]. To provide a solution to the problem of achieving economic stability of Russia and its regions outside innovation paradigm in modern conditions of a globalized world is not possible.

Given that resource mining industry and production of primary processing of mineral raw materials shortly before the default 2014 spent some retooling (what compelled them to change conditions in the respective world markets), reserve time to maneuver Russia until there are.

Key priorities to strengthen the economy in the medium term should be to create conditions for the development of modern industries in Russia capable of issuing competitive on world markets of high-tech products and the formation of the modern sector investment engineering. Achieving this goal will create real conditions for addressing the problems of import substitution and update the technological base of key elements of production systems and supporting infrastructure.

Table 2

High-tech exports, 2016 (international map)

Country	billion dollars of United States	Share in world exports of high-tech, %	Share in export production, %
Russia	***6,6***	***0,33***	***10,72***
China	496,0	24,94	25,24
Germany	189,6	9,54	16,91
United States	153,5	7,72	20,00
Singapore	126,3	6,35	48,83
The Republic of Korea	118,4	5,95	26,58
France	103,8	5,22	26,67
Japan	92,9	4,67	16,22
United Kingdom	68,3	3,43	21,83
World total	**1988,6**	**100,00**	**17,94**

Note: compiled from World Bank [4].

An important feature of formulating priorities innovation strategy in the region, as already noted, was the need to take into account the characteristics of the type of its industrial development, which is able to provide a solution to important problems of maintaining the competitiveness of the territory, taking into account the State of affairs in the industry in the context of growing globalization. The high level of science-intensive high-tech industries in the economic structure of the region depends on state scientific and innovation potential. The reasons are clear: if high-tech manufactures continuous improvement is a key to survival in the face of heightened competition than ever for markets, for natural resources of the territories, it is a subsidiary factor working primarily on maintaining adaptive functions.

At the same time innovative system, as an integral part of the regional socio-economic organism has specific features, which have a strong impact not only on economy, but also on the overall social and cultural background of the region. This background is largely determines the status of the innovation potential of the territory and the possibilities for its realization. The growth of the high-tech sector of the economy stimulates quality improvement of human capacities and expanding niche for innovation. Other things are regions, which have long been focused primarily on extraction on natural resources. Here the status of human capacities often becomes one of the main barriers to the development of the innovation system.

Practice shows that the higher the level of concentration in the region of knowledge-intensive industries, the greater resistance of its economy depends on the ability of the innovation system for the timely production of original and prac-

tical development of a high degree of novelty, and thus from its completeness and underdeveloped. On the other hand, the development of the innovation system is largely determined by the demand for innovation on the part of the productive sector, its level of innovation receptivity and the structure of demand.

In transition conditions of the world community on the model of innovative development, as well as the increased competition on world markets and increased military and political tensions in the world, the role of innovative component in ensuring economic security increases. In this regard, the strategically important for Russia to speed up the process of modernization of socio-economic system and, above all, production and management systems on the innovation basis. Available scientific potential allows to do this.

The solution of the problems is a complex task, involving, on the one hand, the emergence of the latest breakthrough technologies of the modern dynamic competitive economy, and on the other hand, - serious technological modernization of basic production.

Thus, the authors propose theoretical and methodological approaches to solving problems of innovative development, which adapted to Russian conditions and are aimed at improving the quality of the management processes of the innovation component of the economy in the regions of the Russian Federation.

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制定教育质量评估体系的区域方法：来自工作经验
REGIONAL APPROACHES TO THE DEVELOPMENT OF AN EDUCATION QUALITY ASSESSMENT SYSTEM: FROM WORK EXPERIENCE

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注解。 本文介绍了该地区在形成评估教育质量的区域系统方面的经验。 分析了该地区学龄儿童参与监测研究的主要结果。 显示如何使用报告信息。
关键词：教育质量，监测研究，评估程序的客观性，元认知结果，信息系统«测试VM»。

Annotation*. This article describes the experience of the region in the formation of a regional system for assessing the quality of education. Analyzed the main results of the participation of schoolchildren in the region in monitoring studies. Showing how to work with reporting information.*
Keywords*: quality of education, monitoring studies, objectivity of assessment procedures, metasubjective results, information system «Test VM».*

One of the priorities of the modernization of Russian education is to ensure the quality of education. In this regard, the education system today plays the role of the engine of systemic transformations in all spheres of the state's life. Under modern conditions, the methodology of quality management, aimed at transferring the education system to a new state, providing high-quality modern education

that is adequate to the needs of a developing individual, society and the economy, is of fundamental importance. To do this, it is necessary to constantly improve management. And in this situation there is a need to influence the emerging processes, which is impossible without studying their dynamics, obtaining objective information about the quality of education.

Monitoring studies of the quality of education become a resource for the innovative development of the regional education system, because it allows to establish the causes of the results, and therefore work purposefully to improve the state of the educational system.

In the Republic of Buryatia, there is a multi-aspect, multi-level model of a regional system for assessing the quality of education, which is an integral part of the all-Russian system, providing an assessment of educational achievements and the identification of factors affecting them, taking into account such aspects as conditions, processes and results.

The quality of education in the Republic of Buryatia is considered as a system-forming factor in the development of regional education.

Every year, schoolchildren take part in All-Russian screening works (hereinafter referred to as ARSW) - test papers on individual academic subjects to assess the level of schoolchildren's training in accordance with the standards. Conducted at a single time on a single set of tasks, as well as the form of assessment criteria for the Russian Federation. All-Russian verification work allows you to identify problem areas of each student and adjust the looming moments to graduation classes.

In 2018, 13,900 4th grade students and 12,300 5th grade students took part in ARSW in regular mode. In the approbation mode, pupils of the 6th and 11th grades took part in six academic subjects, pupils of the 10th grade took part in geography.

As the analysis of the results of the ARSW shows, the academic performance and quality of knowledge of the region in all academic subjects in 4th and 5th grades are below the average Russian values. There are participants with an unsatisfactory level of training and this indicates that there are problems in the preparation of such participants.

The results of ARSW in 4 classes are characterized by low values of the proportion of participants with an unsatisfactory level of training and high values of absolute performance and quality of knowledge. The tendency to decline in progress in the transition from elementary school to primary is characteristic not only for the region, but also for the federation as a whole. For example, in the Russian language, the proportion of students with an unsatisfactory level of training in the region increases from 11.4% in 4th grade to 26.4% in 5th grade. In terms of federation, the proportion of unsatisfactory results increased in the same subject from 4.6% in 4th grade to 15.1% in 5th. The decrease in academ-

ic performance, in our opinion, occurs against the background of the ongoing physiological changes in the body of children, a change in teachers, as a result of which the individual approach is disturbed. Many students may not have completed a full adaptation in primary school: more subjects appeared, the material became more complicated.

According to Rosobrnadzor Sergey Sergeevich Kravtsov, one of the factors for improving the results of Russian schoolchildren in international studies of the quality of education was an increase in the objectivity of the final attestation of eleventh graders. However, he noted that there are problems with the organization of the system of work to ensure objectivity of evaluation during other evaluation procedures, such as the final essay and All-Russian screening work.

Indeed, this is also the case in our region. Thus, in one of the schools in the region, according to the results of the ARSW in the Russian language, there was a sharp change in the results of one parallel from 2017 to 2018: the percentage of completion, for example, the 1Q2 task of punctuation norms, underwent a negative jump from 85 to 19%. And this tendency is characteristic for the majority of tasks performed by students of the parallel of this school. This, above all, speaks of the bias of the results of 2017.

The reason for doubt is the high results of the execution of most of the tasks of ARSW by students of a school that is not an innovation-type school compared to the average result for the region. As a rule, the results obtained are not confirmed by high scores of the Unified State Exam among graduates.

In recent years, the USE procedure has been significantly improved, which makes it possible to speak of a high degree of objectivity of the results, as well as equality of conditions under which the examination is held. USE on most subjects - an exam by choice. The real basis for analytical work are the results of the USE only in Russian language and mathematics. In general, the results of the Unified State Exam in the Russian language are close to the average in Russia. For example, the proportion of students with an unsatisfactory level of training in the republic in 2018 was 0.59%, while the share of high scores was 20.18%. And in Russia, the same figures were 0.4% and 26.7%, respectively. In mathematics, the indicators are lower, but they are stable for several years, i.e. there are no sharp jumps or falls.

OGE results in the same subjects also allow us to state a generally positive trend. Since 2015, examinations of OGE examinations are carried out at the regional level. The number of fives at the OGE, confirming their results later on with the passing of the Unified State Exam, increased 2.5 times compared to the previous period. Thus, in 2016, 867 students passed the OGE to the top five in mathematics, of which they passed the basic level 524 in the unified state examination, 306 students confirmed their marks, i.e. 58% of the participants of the

number passed. For comparison, in 2017, at the Unified State Exam, less than 20% of participants in the Unified State Exam in mathematics confirmed the top five at the OGE.

It should be recognized that working with information remains ineffective, because a large enough array of unregulated data on the state of the education system is collected, but most of it is needed only for vertical reporting, and only a small one forms the basis of analytical products that respond to user requests and allow solving management tasks. It is often impossible to export and import information from the school system to the municipal system, and later to the regional. To solve this problem, the Information System "Test VM" is used in the region, which is used in regional monitoring studies.

The material from the database allows educational organizations and municipalities to organize the collection, storage, processing of information; provide continuous monitoring of the state of the educational process and predict the development of the school and municipal systems. "Test VM" allows you to process data on the current and final performance of students on monitoring diagnostics.

The information thus obtained makes it possible:

- to evaluate the results of the educational activities of each student, class, school, district and region as a whole on all subjects or on the chosen subject for any period of study;

- to view information about the student and analyze the performance indicators for any period of study;

- to track the dynamics of changes in the results for each subject of an individual student or class as a whole from year to year;

- to analyze the dependence of the level of progress on the level of material and technical equipment of the educational organization, etc.

After automatic data processing, the software module allows you to get information ready for analysis in tabular and graphical forms.

Using the system, educational organizations, municipalities begin to independently analyze the results obtained and, on their basis, propose management solutions.

This program allows you to solve the problem associated with the failure of KIM. For federal appraisal procedures, the FIPI is engaged in the development of KIM, but there is also a need to create a regional KIM bank: for example, in the Buryat language, the Russian language, taking into account regional specifics due to a significant number of foreign phones. The VM test allows you to construct tasks in a test form by choosing an answer, short and detailed answers.

In order for the tests to be valid and could be used in the future, the test tasks are examined in the VM Test. To this end, the first steps are being taken to create

an expert community working on the development of test items, their expertise and further approbation.

Another issue on the agenda is the correct comparison of the results of assessment procedures, which allows to obtain additional important information about the quality of education. As an example, let us give a study of the quality of education in physics of 9th grade students and a study of the competencies of physics teachers. The monitoring model used made it possible to identify students' difficulties and correlate them with the level of professional competence of a teacher for organizing an educational process aimed at filling the identified deficiencies. Methodical recommendations were prepared, adjustments were made to refresher courses and, as a result, a decrease in the share of participants in the Unified State Exam in physics who did not overcome the minimum thresholds and an increase in the share of high scores.

The federal state educational standard has put on the agenda the issue of ensuring the quality of education. In this regard, the sphere of competence of the teacher has expanded: he must form and substantive, and metaspecific results, conduct their diagnosis, evaluate the results, identify weaknesses and correct the situation. However, the results of the study of the competences of physics teachers have shown that teachers have difficulties in forming and evaluating metaspecific results. And it is quite reasonable, since normative documents do not contain a clear description of the ways of forming and evaluating metasubjective results. In the questionnaires, 85.92% of participants indicate that they are evaluating metasubjective results using tests and consider that they form metadisciplinary skills. Of these, only 15% of participants use such forms of work as project execution, laboratory work, meaningful reading of text, group work forms. Another 14% of teachers do not have an idea about the possible types of tasks for the verification of metasubject skills.

The above allows you to highlight some of the problems of modern education. First of all, it is not enough for students today to simply have knowledge and act according to a certain algorithm, you need to learn how to apply knowledge in different life situations. The task of the teacher is to teach them this. The assimilation of subject knowledge is preserved as the primary task of learning, however, knowledge is considered primarily as the foundation of education, and for it effective use it is necessary to master universal learning activities and ways of working. These universal methods of activity are stated in the FGOS as metadisciplinary skills, but they do not have their special place in school education. To solve this problem, it is necessary to move from work on the textbook to work on the final result, from the tactics of «teaching the subject» to the approach of «teaching the child».

For the organization of effective training, the teacher must use the assessment system not only for control, but for supporting the student, for shaping the learn-

ing path (class, student). To do this, the teacher needs a quality reliable tool for monitoring learning outcomes. The concept of the FGOS declares a formative assessment, which implies a transition from a quality control model to a quality assurance model for education.

And the most acute problem is the weak inner motivation of children for the educational process. To solve it, it is necessary to increase the attractiveness of reading, learning, knowledge in students, to provide them with a tool that works for the quality of education, to move from teaching reading to reading for learning.

The solution of these problems, in our opinion, will be facilitated by the project of the regional center for information processing and assessment of the quality of education, «The Irbis Journey through Buryatia» as a methodological tool for a teacher who helps develop pupils of 5th and 6th grades with metasubject skills.

The project is planned to be in the form of a newspaper with 23 thematic issues dedicated to the municipalities of the Republic of Buryatia.

Students will get acquainted with the material of the newspaper, study the proposed articles and perform exciting tasks. The tasks, that will have a different response format, are compiled on a competence-based ground and are aimed at shaping various aspects of reading literacy.

The project is aimed at expanding the horizons of students in grades 5-6, mastering such effective methods of reading and searching for information, such as the ability to navigate the content of the text, to answer questions using the information explicitly given in the text; interpret information, answer questions using implicitly specified information; assess the accuracy of the information provided, make value judgments based on the text; create their own texts, apply information from the text in solving educational problems. This will allow to expand information competence, to determine the level of formation of metasubjective results, including cognitive universal educational actions for working with information and reading as a necessary condition for successful learning in school.

Modern children know Spider-Man, Superman, but do not know the history of their hometown. In one of the tasks of the National Research on the Quality of Education (hereinafter referred to as NRQE), it was necessary to name regional historical figures who made a significant contribution to the history of the region, explain what this contribution consisted of. In 2016, only 9% of students in the 8th grade of the Republic of Buryatia - participants in history NRQE were able to answer this question. This suggests that students' knowledge of their hometown, the republic is extremely poor, many are not interested in the history of the city, they do not attend exhibitions, parks, theaters.

This is evidenced by the results of a survey of the regions of the republic, their sights, which we conducted among the random passers-by of the city of Ulan-Ude. Less than a third of respondents could answer simple questions that were asked.

We all understand that modern children are in the infinite information space. Children are used to using gadgets, iPhones, computers and do not read books. The implementation of the project will provide an opportunity for the students of general educational organizations to develop a positive attitude towards receiving information through printed publications, and to further contribute to the preparation for participation in international studies of the quality of general education.

An innovative, attractive form of working with students will contribute to the expansion of knowledge and development of students' interests about the small homeland: its history, traditions, cultural environment, heroes; the formation of students' conscious attitude to the values of the national culture, past, present and future of their native land.

Tasks offered to students after acquaintance with the thematic issue, do not test subject knowledge as such, but the ability to use them in different, including unfamiliar situations.

It should be noted that the work on the dissemination of innovative experience of educational organizations introducing innovative systems for assessing the quality of education, methodological services of different levels lacks systematic, dynamic and therefore this experience is not considered as a resource for the development of school and municipal education systems. To solve this problem, we use the whole range of possible forms of dissemination of innovative experience. We use already approved channels - collections, analytical materials, brochures, field seminars and much more.

One possible way is a conference. During the last three years, the RCSEI and OKO conducts an All-Russian scientific-practical conference with international participation “Assessment of the quality of education: from design to practice”. Taking into account the change in the foreign policy vector of the Russian Federation towards the countries of the Asia-Pacific region - this circumstance is very important, since we regard education as a strategic resource, as one of the elements of the policy of “soft power”.

If we talk about the vectors of development of the education quality assessment system as a whole, then, of course, with the amount of data that is available today, strengthening of the digital component is required, further improvement of automated services, allowing education system specialists to use various data, statistical reports, analysis tools data, automatically calculated indicators that characterize the state of the system. Over time, convenient services for parents should appear, giving useful information and helping to solve urgent problems.

Thus, solving the voiced problems in the functioning of the regional system for assessing the quality of education will in effect allow to move from quality control to quality management and, ultimately, to solve the main task of the education system - to provide affordable quality education.

物理和纳米技术在技术大学的教育信息环境中
PHYSICS AND NANOTECHNOLOGY IN THE EDUCATIONAL INFORMATION ENVIRONMENT OF A TECHNICAL UNIVERSITY

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注解。 本文讨论了纳米技术在研究技术大学学生普通物理课程中的应用和交流。
关键词：物理学，纳米技术，教育质量，信息技术。
Annotation*. The article discusses the use and communication of nanotechnology in studying the course of general physics of students of a technical university.*
Keywords*: physics, nanotechnologies, quality of education, information technology.*

Modern information educational environment defines new requirements for the training of technical specialists. The use of information technology at the university significantly increases the level of students' competence with their subsequent use in their professional activities, in solving specific professional problems and in everyday life [1]. The principal difference in the system of training within the framework of higher education in our country was that higher technical education shaped technical thinking throughout the entire period of study.

Today, technical thinking is not the prerogative of graduates of technical or natural sciences departments of higher education, it is a requirement imposed by time to any highly qualified specialist.

The transition of the Russian system of higher education to new forms of education will tighten the requirements for the study of general educational disciplines of technical universities using models of the processes taking place in society, in devices, in production cycles and linking them to modern technologies.

The terms “nanotechnologies”, IT technologies, gene modifications, etc., are now popular. penetrate from the sphere of purely scientific information in everyday life. It is as if science loses its “elite” purpose, turning into an instrument of everyday life, transforming the content, structure and forms of the educational process.

The reduction of study hours in the classroom in general physics within the framework of higher technical education in connection with the transition to the Bologna system forces us to look for new forms and ways of conveying key knowledge on the subject. The inclusion in the studied material, concrete examples related to nanotechnology allows us to solve a number of problems. First, for students, the popular word “nanotechnology” is filled with concrete content, thus forming a technical culture in the use of terminology. Secondly, concrete models that are fundamental in the course of general physics, illustrating the physical meaning of the physical phenomena under consideration, acquire increased importance, since they show the connection of knowledge gained in the framework of the studied discipline with the demand of time. Thirdly, the task facing universities, which are involved in the development of priority research areas identified by state programs for technical universities, is being solved, as targeted training for current areas of production is improved.

At the first, essentially introductory, lecture devoted to the beginning of the study of the course of general physics, explaining the significance of the laws of "Mechanics", it can be shown how the simplest laws of classical mechanics applied to individual objects of the macrocosm surrounding us are also important for the microworld that changes its functional purpose many items that are used both in everyday life and for production purposes.

In subsequent lectures, for example, in the study of energy, it is necessary to talk about a nanomotor - a molecular device capable of converting energy into motion [2, 3]. At the same time, the students' attention is fixed, not only on the new device of the microworld, but also on the units of measurement of the forces of molecular motors of proteins, measured in piconewtons. An example of motor proteins that move "cargo" in the form of various molecules through the microtubule channels inside the cells allows us to focus on the fact that knowledge of the mechanisms of movement is being studied in various technical disciplines, and acquire a new degree of relevance in connection with the introduction of new technologies.

When studying the “mechanics” section associated with rotational motion, it is extremely important to talk about molecular rotors, which are synthetic nanosized engines that generate torque when a sufficient amount of energy is applied to them [4,5].

Of no less interest is the story of molecular propellers - nanoscale molecules having the shape of a screw, which are able to perform rotational movements because of their special spatial form, similar to the shape of a macroscopic screw [6,7].

When studying the basic principles of "molecular physics", the possibilities of using examples related to nanotechnology are significantly extended:

First, in a comparative study of the model of an ideal and real gas, we can give an example of creating a molecular manipulator, based on which the forces of gravitational interaction, which act in the microworld, will have less and less influence, and the forces of intermolecular interactions and van der Waals forces will significant. At the same time, it is possible to focus attention on the fact that it is the Russian school of theorists working with van der Waals interactions in micro-objects that is the strongest in the world.

Secondly, when considering physical models applicable to liquids, we can talk about nanofluidics [8] - the section of hydrodynamics of nanostructured liquids, when such unusual properties as, for example, a sharp increase or decrease in viscosity near the walls of nanocapillaries, changes in the thermodynamic parameters of the liquid, as well as the fact that there is atypical chemical activity at the interface of the solid and liquid phases.

Thirdly, when describing the importance of studying intermolecular interactions, we can mention such a new science as supramolecular (supramolecular) chemistry, which includes chemical, physical and biological aspects of considering more complex, than ordinary molecules, chemical systems connected into a single whole through intermolecular (non-covalent) interactions that form peculiar blocks [9].

When studying the conductivity of dielectrics, semiconductors and conductors in the framework of the section of the general physics course "electricity" and "magnetism", initial knowledge about the models and laws of the microworld is formed. The use of physical models that make up the basis of the band theory of conductivity allows students to show how the classification of materials based on the difference in their ability to transmit electric current can be explained from a unified position.

Reducing the size of devices has become a natural process of modern electronics. At the same time, economic costs increase, their reduction is essentially the task that nanotechnologies are capable of solving as part of the development of electronics.

Within the framework of this topic, an excellent example demonstrating the capabilities of nanomaterials is the wide range of applications of graphene - a monolayer of carbon atoms. Graphene was obtained in 2004 and is still little studied. For "advanced experiments with two-dimensional material - graphene" A. K. Heim and our former compatriot K. S. Novoselov were awarded the Nobel Prize in Physics for 2010 [10]. If the question of the formation of a "forbidden zone" of graphene is solved, then it will replace silicon in integrated circuits. Graphene can also be used to make electrodes in ionistors (supercapacitors) for use as rechargeable current sources. Prototypes of ionistors on graphene have a specific energy capacity of 32 Wh / kg, comparable to that for lead-acid batteries (30–40 Wh / kg).

In the press, there was information about the creation of a new type of graphene-based LEDs, while the low cost of recycling was noted.

An example with graphene characterized by a monolayer can be supplemented with a second example, which is no less spectacular. This prince is a technology, or the process of forming three-dimensional micro- and nanostructures, based on the separation of strained semiconductor films from the substrate, followed by their folding into a spatial object. The technology is named in honor of the scientist from the Institute of Semiconductor Physics of the SB RAS V.Ya. Prince, who proposed this method in 1995 [11,12].

In the study of electromagnetic waves generated in electrical circuits, as an example, you can consider alternative ways of receiving signals. Here it is appropriate to talk about the antenna oscillator with dimensions of the order of 1 micron, created in 2005 in the laboratory of Boston University. This device has 5000 million atoms and can oscillate with a frequency of 1.49 GHz, which allows transmitting huge amounts of information with its help [13].

Within the framework of this topic, as a rule, the phenomenon of resonance is considered, in this connection, along with examples of the discovery of electron paramagnetic resonance in Kazan and a story about the modern Kazan school of physics, and especially resonance spectroscopy, it is appropriate to tell about plasmons. Plasmons are collective oscillations of free electrons in a metal. In early 2000, an impetus was given to the development of a new area of nanoplasmonics, based on the technology of manufacturing nanoscale particles. As a result, it was possible to transmit electromagnetic radiation along a chain of metal nanoparticles using the excitation of plasmon oscillations [14, 15].

When you finish reviewing the "magnetism" section, you can talk about the modern global science project Spinhenge @ home. This is a voluntary computing project on the BOINC platform. The goal of the project is targeted synthesis of specially designed magnetic molecules (for example, $Mo_{72}Fe_{30}$ and $Mo_{72}Cr_{30}$) based on quantum mechanical modeling using the Monte Carlo method (Metropolis algorithm), the results of which can be directly compared with experiment. At the same time, it is planned to expand data on molecular magnetism and the search for possible uses in applied fields. The beginning of the calculations dates back to 2006, and they were initiated by the University of Applied Sciences in Bielefeld, the Department of Electrical Engineering and Computer Science, in collaboration with the US Department of Energy and the Ames Laboratories of the University of Iowa, and in 2010, 56,000 volunteers (141,000 computers) from 183 countries providing a computing power of 5.8 teraflops. A promising area of practical application of this project is the creation of highly integrated memory modules and miniature magnetic switches. The most urgent field of application is predicted - local chemotherapy of tumors [15].

The aforementioned topics can be offered to students as essay topics for independent work with literature in the framework of practical exercises and seminars. It should be noted that the main source of information when studying the practical use of nanotechnology is, of course, the Internet, and not only from the well-known and most popular Internet publication Wikipedia [13], but from foreign websites, which will require students' knowledge of a foreign language.

The given examples on nanotechnologies and nanomaterials actualize the basic knowledge generated in the framework of the general education general physics course, on the one hand, on the other hand, show the student the need for integrable approaches, which are possible only if a specialist has developed technical thinking and has solid knowledge of basic subjects of higher school [17]. The achievements obtained as a result of the application and introduction of new technologies enrich traditional knowledge, giving them a sharpness of novelty, increasing interest in such a general educational subject as physics in higher education, which undoubtedly affects the improvement of the quality of education.

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医学院拉丁语教育环境中“圆桌会议”和“投资组合”的技巧
TECHNIQUES OF THE «ROUND TABLE» AND «PORTFOLIO» IN THE EDUCATION SETTING OF THE LATIN LANGUAGE IN MEDICAL SCHOOLS

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摘要。本文致力于可以在大学中积极使用的教学方法。本文的目的是分析拉丁语课程中使用的一些现代教学技术。关于在学习过程中引入计算机技术，该主题是相关且需要的。交互式教学方法的使用是教学方法的重要问题之一。

本文介绍了“圆桌会议”的方法和“组合”的方法，这些方法在梁赞国立医科大学临床心理学和医学预防学院的学科“拉丁语”学习中得到了积极的应用。 IP巴甫洛夫。给出了这些技术在拉丁语课堂教学过程中的应用实例。在使用这些技术的过程中，学生们对拉丁文学的研究表现出了更大的兴趣，同时也增加了认知和创造活动。

“圆桌会议”的方法和“组合”的方法可以用来提高学生在大学“拉丁语”学科研究中的动机和表现。 “组合”方法涉及感兴趣的情感和认知类型的发展，独立活动的技能，增加学生的活动和学习拉丁语的动机。 “圆桌会议”的方法允许增加学生对培训课程的兴趣以及培训课程内容中包含的问题。 “圆桌会议”提高了培训的有效性，因为学生的理论知识与他们的个人经历的比例，并允许您找到问题的最佳解决方案，同时考虑到每个对话者的观点。

关键词：教育技术，方法，教育，圆桌会议，投资组合

Abstracts. *The article is devoted to pedagogical methods that could be actively used in university. The purpose of this article is to analyze some modern pedagogical technologies that were used in Latin classes. In connection with the introduction of computer technology in the learning process, this topic is relevant and in demand. The use of interactive teaching methods is one of the important issues of teaching methods.*

The article describes the method of "round table" and the method of "portfolio", which are actively used in the study of the discipline" Latin language " at the faculty of clinical psychology and medical-prophylactic faculty of Ryazan State Medical University named after I. P. Pavlov. Examples of application of these

technologies in the educational process in the classroom in Latin are given. During the use of these techniques revealed that students showed greater interest in the study of Latin aphoristics, as well as increasing cognitive and creative activity.

The method of "round table" and the method of "portfolio" can be used to increase the motivation and performance of students in the study of the discipline "Latin language" in university. The "portfolio" method involves the development of emotional and cognitive types of interest, skills of independent activity, increasing the activity of students and motivation to learn Latin. The method of "round table" allows to increase the interest of students to the training sessions and to the problems that are included in the content of the training session. "Round table" increases the effectiveness of training, as there is a ratio of theoretical knowledge of students with their personal experience, and allows you to come to the optimal solution to the problem, taking into account the views of each of the interlocutors.

Keywords: *pedagogical technologies, methods, education, round table, portfolio*

Pedagogical science is development constantly. There are new directions, techniques aimed at achieving the main goal – education and training of the individual. In higher education pedagogical methods should be selected in accordance with the objectives set out in the Federal law "on education in the Russian Federation". The introduction of new methods is an inevitable process to improve the efficiency of the educational process. In modern methodological literature the concept of "pedagogical technologies" becomes more relevant. The first time this term was mentioned in the beginning of the twentieth century in the works of the following scientists: V. P. Bespalko [1], Gussev V.V. [2], Selevko G. K. [3], Hops N.D. [4]. Later, in the 40-50-ies this concept has expanded because of connection with the introduction of software and automated forms in the learning process. There are many definitions of the term. For example, V.P. Bespalko wrote: "Educational technology is a set of tools and methods play theory-based processes of training and education to successfully realize its educational goals" [5, p. 126]. Likhachev believed that "a set of psychological and pedagogical settings that define a special set of forms, methods, teaching methods, educational tools; it is the tools of the pedagogical process, which is implemented in the technological process. The technological process is a system of technological units, focused on specific pedagogical results" [6, p. 147]. V.A. Slastenin called educational technology – "zakonomerno pedagogical activities and implements a science-based project of the didactic process and possessing a higher degree of efficiency, reliability and warranty of result than the traditional methods of learning" [5, p. 38]. The teacher of the higher school, G. Fokin, understood the synthesis of theoretical, applied and procedural technologies as the unity of theoretical provisions, applied provisions and the mechanism of their implementation in a particular environment, in space; as a technological map prescribing a certain technological process" [7, p. 131, 132].

Based on these definitions, it can be concluded that the pedagogical technology is an instruction, instruction on the performance of any activity, a set of methods and techniques by which the modern educational system can be implemented. The development of these technologies allows to reach a higher pedagogical level. Within the framework of pedagogical technologies used by teachers in universities, it is possible to distinguish various interactive methods, types and forms of classes, for example, differentiated training, developing training, problem training, game training. Various types of educational work in the classroom in high school contribute to the mastery of the culture of thinking, the ability in writing and speaking logically correct formalize its results. The importance of students ' cognitive activity activation is emphasized in the article by I.V. Motorina [8]. To expand opportunities for the formation of cognitive activity of students and increase the intensity of the educational process in the teaching of the discipline is recommended to use a variety of forms and methods of training.

This article will describe in detail such interactive methods as the "round table" method and the "portfolio" method. They are widely used at the Department of Russian language and Latin language in the study of the discipline "Latin language" at the faculty of preventive medicine and the faculty of clinical psychology in RSMU. There are the method of "round table", which is using besides consolidate the studied material in addition to written or oral frontal survey, training dictators, work with tables,. This method involves conducting academic discussions, with the aim to repeat the theoretical and lexico-grammatical material before the midterm or final assessment. In this case, the student can use the material, which is accumulated at the moment (plans, abstracts, answers to questions). The main purpose of such classes is to provide students with the opportunity of practical use of theoretical knowledge. Students should learn to act as speakers and opponents, to master the skills and abilities of setting and solving intellectual problems and problems, to defend their point of view, to demonstrate the achieved level of theoretical and practical training. The main topics of the course, the most difficult for understanding and assimilation, are brought to the practical classes "Round table". The topics are discussed collectively, which ensures the active participation of each student. Preparation and discussion of topics raised in the framework of the "round table" allows to solve a number of pedagogical problems.

The next method, which is actively used in Latin classes, is the "portfolio" method. First of all the word "portfolio" meant an album with photos. In the Renaissance, architects and artists brought with them a "portfolio", when they claimed a place in a construction project or Academy of arts. With the help of the collected documents it was possible to make an impression about yourself for the future employer. The idea of using the portfolio in education belongs to the United States [9, p. 526]. Currently, this method is actively used in higher educa-

tion. Thus, the method of "portfolio" can be used in the study of all sections of the Latin language course. Evaluation by this method is a pedagogical strategy of data collection and systematic organization. Students create their own working file folder that contains a variety of information documenting their experience and achievements.

At the beginning of the academic year, the student receives a task - in the study of the course of Latin to create their own portfolio of documentary form, answering in writing the questions given at the end of each lesson, thus making a plan-summary of the topic. In addition, students are invited to collect a portfolio of "works", giving an idea of the educational and creative activity of the student, the direction of his interests. In particular, when studying the section of Latin aphoristics, the portfolio of" works " is a collection of various creative and design works of the student, as well as a description of the main forms and directions of his educational and creative activity: participation in scientific conferences, competitions, competitions. For example, the competition for the best emblem or drawing to the ancient saying in Latin language gave an opportunity to develop independence, activity and creativity of students. In the process of training the participants studied the secondary literature and selected sayings, Proverbs, and materials for illustration. Through this method's help is a accumulation of material, its understanding, active assimilation of new and activation of the studied, broadens the mind and increases the General cultural level. Some students were involved in evaluation activities, which contributed to the intra-group integration of students and develop cooperation skills. The method of "portfolio" involves the development of emotional and cognitive types of interest, skills of independent activity, increasing the activity of students and motivation to learn Latin.

During the experiment on using of these methods, it was found that the number of students who successfully passed the final control increased by at least 30%. It was noted that the students perceived the information better, live discussion with the teacher allowed to increase the cultural level of students, and also gave the opportunity to live communication.

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评价学生形态发育关键时期的速度 – 能力发展
EVALUATION OF DEVELOPMENT OF THE SPEED-POWER ABILITIES OF STUDENTS IN THE CRITICAL PERIOD OF THEIR MORPHOLOGICAL DEVELOPMENT

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注解。 本文讨论了与实施监测和评估学生在性发育关键时期的速度 – 能力发展水平相关的问题和问题。 为了讨论，提出了一系列测试任务，作者认为，这些任务允许对速度 – 能力能力的发展水平进行完整的客观评估。 在实验期间确定的测试结果的组间可变性使我们能够证实速度 – 力量训练个性化的需要。

关键词。 速度能力。 监测和评估。 形态发展。 变异系数。

Annotation. *The article discusses issues and problems associated with the implementation of monitoring and assessing the level of development of speed-power abilities of students in a critical period of their sexual development. For discussion, a block of test tasks is presented that allows, in the opinion of the authors, to give a complete objective assessment of the level of development of speed-power abilities. The intergroup variability of test results identified during the experiment allows us to substantiate the need for individualization of speed-strength training.*

Keywords. *Speed-power abilities. Monitoring and evaluation. Morphological development. Coefficient of variation.*

Introduction

Considering the manifestations of speed-power abilities authors V.L. Volkov [1], V.P. Filin [4] distinguishes two types of its manifestation: explosive and fast force, each of them manifests itself in its own way. Fast strength is characterized by unsatisfactory muscular tension, the exercise is performed at a considerable speed, but does not reach the limit value. Explosive force is a person's ability to achieve maximum strength indicators in the shortest possible time, in the process of performing some kind of motor action (for example, when performing jumps or throwing projectiles).

The considered age period of 10-15 years (average school age) is the most critical in the development of motor abilities and, first of all, speed-power ones. This is explained by the fact that the process of developing motor abilities occurs against the background of significant morphofunctional rearrangements of the adolescent organism [3]. During this period, there is a significant imbalance between morphological rearrangements and the functional development of the child's body, where an inverse relationship between these two variables is clearly visible.

Research methods and organization

The analysis of scientific and specialized literature shows that

in the system of school physical education, speed-power abilities are measured, most often, by a standard block of test tasks: long jump

from place; Throwing tennis and throwing a stuffed ball. Test data set

does not take into account morphological changes occurring at this age, which are associated both with the processes of puberty and the uneven development of various body systems. The presented tests characterize the manifestation of explosive force, but there are no tests evaluating the manifestation of fast force. There is a need to form a block of test tasks, which will allow to assess the level of development of speed-strength abilities of the main muscle groups, which

in the future it will allow for the individualization of the pedagogical process of developing speed-power abilities.

Analysis of the methodological material and training programs from various sports allowed us to form a block of test tasks, which allows us to comprehensively assess the manifestations of speed-strength abilities:

1. Long jump from the spot;
2. Throwing a ball from a standing position, the ball at the bottom (2 kg);
3. Throw stuffed ball with two hands on the chest (2 kg);
4. Throwing a tennis ball;
5. Jump up on the method of Abalakov;
6. Bending and unbending the arms in the prone position (n-5);
7. Raising the body from supine position (n-10);
8. In the prone position, bend (n-10);
9. Five-foot long jump;
10. Pulling up in a vise standing bent on the gymnastic wall, hands on the trapezium (n-10);
11. Jumping on the cabinet height -30 cm. (N-10).

It is necessary to pay attention to the fact that in all tests not the task execution time is indicated, but the necessary number of repetitions. This is due to the fact that the end of the execution time can occur at any phase of the movement, someone has already begun to perform the next movement, and someone just finished the movement. They will get the same result, but the one who started the new

movement performs faster, which is very important when assessing speed-power abilities. Therefore, the assessment was made on the execution time, a certain number of movements, where differences in hundredths were often detected - 0.01.

Research results and discussion

A good indicator of individual differences and features of the development of certain manifestations of speed-power abilities, is the coefficient within the group variation, which allows you to compare the variability of statistical aggregates, reflecting the results of test tasks, measured

in the corresponding physical units [2].

The coefficient of variation is determined by the formula

$$V=(\sigma / x) \ 100\%. \quad (7)$$

Where õ – standard deviation;

$\underline{x}$– arithmetic average of a given series of measurements.

The coefficient of variation ranging from 0–10% is small; in the range of 11-20% - medium; more than 20% is big.

The coefficients of variation revealed by us (individual differences) show differences in the rates of development of speed-strength abilities
students of the same class, or students of the same age.

Table - *Inside the group variation of development indicators of speed-power abilities of students of middle school age (n-57)*

№	Test Type	Boys V	Girls V
1.	Long Jump	17,5%	14,2%
2.	Throwing a ball from a standing position, the ball at the bottom (2 kg)	22,4%	24,7%
3.	Throw stuffed ball with two hands on the chest (2 kg)	16,7%	18,5%
4.	Throwing a tennis ball;	23,2%	23,4%
5.	Jump up on the method of Abalakov;	14,7%	17,5%
6.	Bending and unbending the arms in the prone position (n-10);	27,3%	28,3%
7.	Raising the body from a supine position (n-10);	19,4%	15,8%
8.	In the prone position, bend (n-10);	24,6	26,3%
9.	Five long jump;	24,8%	25,4%
10.	Pulling up in a standing bent on the gymnastic wall, hands on a trapeze (n-10);	26,7%	27,3%
11.	Jumping on the cabinet height of -30 cm. (N-10).	23,3%	25,7%

Analyzing the identified coefficients of intragroup variation among students in the critical periods of their morphological development, one can say that
that the greatest differences are revealed in tests characterizing fast strength.

For young men, this flexion is the extension of the arms in the resting position lying down - 27.3%, pulling up hanging while bending over - 26.7%, the fifth jump - 24.8%. In girls, the highest coefficient of variation was noted in the test tasks: bending the arms in the upright position - 28.3%, tightening in the neck - 27.3%, while lying on the stomach, bending - 26.3%. The revealed large coefficients of variation, in these tasks, say

about the need to individualize the development of speed-power abilities just in this direction - fast power.

Conclusion

The study showed that the greatest individual differences are present in the tests for evaluating fast strength. The high differentiation of the results of these tests indicates the need for their use in the process of assessing speed-power abilities, especially during critical periods of the morphological development of students. The results of these tests allow a differentiated approach in the direction of the development of speed-strength abilities in the training and training process.

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交际模式教学生英语语言

COMMUNICATION MODELS IN TEACHING STUDENTS THE ENGLISH LANGUAGE

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注解。 本文讨论了学生在语言培训过程中的主要沟通模式，成功实施沟通的技巧和练习，以及讨论如何成为课堂进一步研究和项目的新工具。

关键词：通信模型，认知模型，主动模型，综合模型，外语。

Annotation*. The article discusses the main models of communication among students in the process of language training, techniques and exercises for the successful implementation of communication, and how the discussion becomes a new tool for further research and projects in the classroom.*

Keywords*: communication models, cognitive model, active model, integrative model, foreign languages.*

The success of communication among students depends on many factors. The choice of communication model is a clear indicator of its effectiveness.

The cognitive model of communication is used for the purpose of transferring and retrieving data, its consideration, interpretation and commenting. The information transmitted expands the informative asset of the communication partners, transmits up-to-date data, explains the conditions that have been formed, gives certain data and numbers, obtains new knowledge or solves the problem. Usually students use such a model during speeches of messages, stories, reports, in writing - abstracts, projects. For the effectiveness of this model, it should be remembered that students should have ideas and knowledge about the topic, installation to receive new information and the possibilities for its processing. At the same time, it is necessary to remember such rules: it is necessary to rationally state the topic, we need logical arguments and characteristic interrelations.

The active model is carried out according to the principle “stimulus - reaction”. The teacher sets the message, and the students give their reaction to it. Often this model stimulates cognitive activity for creative tasks and independent work. One of the rules is the originality of the solution of the task, its rationale and integration with the previously studied material, the use of new solutions.

An integrative model is not only a communication process, but includes, above all, feedback, where participants always switch places. Researcher T.A. Tereshchenko argues that comfortable learning conditions are created under which students (participants) feel their success, their intellectual viability, which makes the process itself productive. With this model of communication, it is assumed that there is group work and its activity, the use of linguistic means of communication (both lexical and grammatical), a change of subjects and positions of the participants. [2]

In this model, students use this kind of exercise as a discussion. This type of activity involves the use of a separate subject and lexical and grammatical material. The more often students use the material they have learned in speech, the more effective the material will be.

The usefulness of the discussion is as follows: on the one hand, it reduces the moment of subjectivity, that is, the beliefs of an individual or group of people in the discussion receive general support, therefore, a certain justification; on the other hand, if it does not lead the participants to universal agreement, it necessarily contributes to a better mutual understanding of the opponents [1, p. 300]. The figure shows the types of discussions:

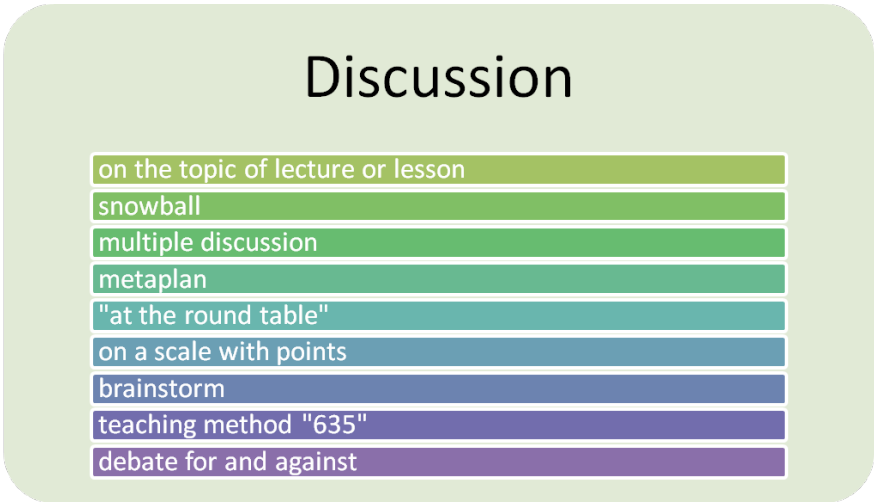

Figure 1. *Types of discussions*

The use of cliché phrases in a discussion is an integral part of the process:

1) At first
2) First of all
3) As far as I remember/know…

4) If I'm not mistaken…
5) If I remember rightly…
6) It's needless to say…
7) It's common knowledge that...
8) It's well known that…

The use of extra emotional words negatively affects the outcome of the discussion. The use of the phrases "I don't like, I would remove it, etc. "- all this is not supported by arguments, so it can not be credited. You argue with facts, conjectures and conditional moods ("and if this event had not happened ...") to the events that took place is inappropriate.

At the stage of diagnosing the formation of communicative competence of students of agrotechnological classes in the process of language training, more than half of the participants are not ready to participate in the integrative communication model, because they have insufficient knowledge of the topic of discussion, cannot correctly formulate arguments and give counter arguments, cannot find their position at the discussion stage.

A distinctive feature of the discussion is the presence of a unifying topic.

It should be said that the first step in solving this problem is the introduction of lexical material. Without a database of words and phrases, we will not be able to function in the discussion. You need to know the definition and clearly understand the concept.

Working with textual material, students need to learn how to highlight the idea of the text, the main idea, identify problems and solutions, both from the author and generate their ideas.

The next stage - we reinforce our ideas with arguments. Arguments should be clear and logical. Students should predict counterarguments. They can build the tactics of discussion.

The final stage is the discussion itself. At this time, students can express their opinions, be able to interact with classmates, learn to listen and highlight not only new words in the process of discussion, but also dismiss unsuccessful ideas. Against this background, in the conclusion everyone can make their own intellectual map, on the basis of which, the main arguments and the students' own opinions will stand out.

One of the varieties of the discussion is the "spinner". Each group has its own experts, advocates and leaders. Groups are replaced in rounds, thereby involving the class in the full work. The task of such a discussion with a teacher is only her organization.

The "talk show" format is an excellent result for expressing opinions. Where students act as experts and in the course of this, they develop communication and follow its rules.

Each subspecies allows students to strategically approach the issue. Students begin to perceive it through planning and forecasting results. It develops metasubject skills that can be used in other subjects.

As for the written discussions, this kind of more productive than oral. The time frame limits the oral form, and we can not limit the written language.

In conclusion, it should be said that the integrative model of communication is one of the most popular. This is all caused by age characteristics, where every teenager needs to express his opinion on the problem, the need for self-education and self-education, in solving global problems.

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编写培训材料的现代方法，用于讨论有争议的历史问题
MODERN APPROACH TO PREPARATION OF TRAINING MATERIALS FOR DISCUSSION DEBATABLE QUESTIONS OF HISTORY

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抽象。 本文讨论了培训材料开发的一些方面，用于讨论普通教育组织中有争议的历史问题，以及教师实施联邦州中等教育标准（全面）普通教育和设备不足的要求。 教育材料的教育过程。 作者提出了一系列材料要求，应该牢记那些决定准备用于在学习普通教育组织的国内外历史的过程中与学生讨论有争议的历史问题的教师。

关键词：有争议的历史问题，有争议的问题，史学单，培训材料，通识教育。

Abstract. *The article discusses some aspects of the development of training materials for the discussion of controversial issues of history in organizations of general education in relation to the needs of teachers to implement requirements of the Federal state educational standard of secondary (full) general education and insufficient equipment of educational process of didactic materials. The authors propose a set of requirements to materials that should keep in mind teachers who decided to prepare them for use in discussing controversial issues of history with students in the course of studying of domestic and foreign history in the organization of general education.*

Keywords: *controversial issues of history, debatable questions, historiography sheets, training materials, general education.*

The task of modern school is to develop students «ideas about historical science, its specificity, the methods of historical knowledge...», «the ability to engage in dialogue, to justify their point of view in the discussion on historical topics, and evaluate different historical versions» [8, p. 15–16].

The term «controversial issues of historical science» we understand as «historiographical version» and «reasoned responses».

We believe that «historiographical versions» should be «consistent with the available knowledge, historical facts and, being put forward to explain any phenomenon or event, should explain its known sides, characteristics and connections with other subjects and phenomena with a possible solution to the controversial issue of historical science» [5; 6].

Under the «reasoned response» we understand the evidentiary and persuasive argument or set of arguments in favor of historiographic versions and justifying the proposed solution to the issue or denial [1, p.180].

By training materials we mean «historiographical sheets», including fragments of historiographical texts from monographs or scientific articles of domestic and foreign historians, brief biographical information about historians, versions of which are considered in the lesson and tasks-questions to each of them [2; 4; 5; 6].

Educational materials for the study of controversial issues of history in general education institutions should reflect the general objectives of education and help to develop curricula acceptable to teachers and not contrary to the instructions of the Ministry of education. Developers should keep in mind that their training materials are designed to:

– stimulate students interest in history as an academic subject;

– expand and deepen students historical knowledge;

– improve the skills to apply the acquired knowledge;

– promote understanding of cause-and-effect relations of historical phenomena and processes;

– encourage active learning;

– be accessible to students with different levels of ability;

– teach students to think, not learn facts;

– allow students to use evidence to defend their point of view and show respect for alternative points of view.

The range of questions, how and what to teach in each subject can be different. To study the debatable issues of history it is:

– how to teach students to assess the quality of evidence;

– how to correctly represent different points of view, alternative interpretations or opposite truths;

– how to explain the presence of controversial issues of history to the younger generation;

– how to awaken young people's curiosity and interest in historical events and their contradictory interpretations;

– how to help young people understand the world in which they live and in which their worldview is formed.

Educational materials for the study of debatable issues of history should reflect the life of society and man. The life of society is described by socio-economic, political, legal and cultural history. Human life is characterized by gender, ethnicity, age, origin, etc.

For a long time the only model of educational materials was a subject textbook that offered scientific knowledge in a simplified form. Didactics, pedagogy, teaching methods and elements of child psychology appeared in textbooks in the XX century. Over the past 40 years, the textbook and supporting resources have become more complex and student-centered.

At the same time, the society showed increased interest in what is taught in schools and how to teach. This has led to the emergence of state educational standards in most countries. Under these conditions, the educational literature began to support the curriculum and help the teacher to implement them. The introduction of the national curriculum shifted the balance of informative educational literature with the presentation of a personal point of view of the author for publication accepted for the compulsory study materials.

The content of educational materials for the study of debatable issues of history should be structured in such a way that students and teachers have a clear idea of the ways of its presentation and assimilation. Methodology and pedagogy should be integrated into each educational element, and the elements should correspond to the training program and the state educational standard. That is why a complete set is needed to study debatable issues of history (textbook, book for teacher, reader, bank of handouts, simulator, control questions, etc.). With this resource support, the teacher must provide quality study of debatable issues of history, monitoring progress in the study and interaction with students in order to teach them to learn.

The growing classroom use of digital materials, along with textbooks and other printed materials have created "blended" teaching and teaching using appropriate educational environment, combining the perception of the material of the textbook with the projected digital material on the interactive whiteboard or screen. It is desirable that the digital material is linked to the textbook through interactive links that allow the teacher to quickly access the relevant material on the Internet or digital library. More importantly, student resources should include a variety of materials, including primary sources, maps, photographs, newspapers, reports, and many other materials for oral discussion and written work.

The material for students should be designed in a narrative style and always focused on children of different abilities. In a structured text, sections are desirable to help the teacher evaluate their students and students conduct research. The content should be consistent with the curriculum, and key elements, chapters or sections should be reflected in the student research curriculum of the respective curriculum.

We recognize that the contradictions in the interpretation of events are determined by their different visions of different historians. Conflict of truth coexist. There are many conflicting themes and opinions in the history of all countries in

which the teacher should try to show the contribution to the formation of national identity of a wide range of social groups and different points of view and emphasize the impact of historical events on both citizens and their leaders.

All textbooks describe invasions, wars, decisions of kings, princes, and parliaments, and the struggle against their consequences at the national and international levels. The interpretation of these events, one way or another, is carried out by the teacher. Therefore, the developed materials, being part of the educational chain, should stimulate active forms of education. It is important when writing materials for children not to avoid controversial issues. It is important that they learn to understand whether the teacher offers several alternatives, or he is clearly biased. And if several alternatives are shown, does the teacher predetermine the choice of one of them, preferring any point of view, or does he remain neutral, offering the students to make a choice themselves. It is also important whether the points of view are evaluated without arguments or conclusions are made after consideration of all points of view, and the teacher acts as a lawyer for the most reasoned version.

In this regard, the teacher of history is required the ability to competently select sources to discuss controversial issues of historical science in the classroom, to argue their attitude to the versions of scientists and use ready [3; 4; 5; 6] or develop their own didactic material.

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从有抱负的医生的角度来看安乐死程序（俄罗斯，非洲，阿拉伯学生的态度）

EUTHANASIA PROCEDURE FROM THE ASPIRING DOCTORS' POINT OF VIEW (RUSSIAN, AFRICAN, ARAB STUDENTS' ATTITUDE)

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注解。没有专业素质的教育和获得有抱负的医生的必要技能和能力，就不可能进行专业的个人发展。在专业人格结构中，价值论成分占据特殊的地位。与此同时，某个专业社区的价值取向和态度通过个人观念和有抱负的专家的概念来解释和感知。在这方面，研究来自不同社会文化群体（第一年医学生）的未来医生对安乐死程序的态度似乎是我们最新的。在我们的案例中，来自梁赞国立医科大学的俄罗斯，非洲和阿拉伯学生以IP Pavlov院士的名字参加了这项调查。

本文介绍了在“不完整句子测试”的基础上获得的数据结果。对结果的分析使我们能够确定安乐死程序的一般性和具体性，并确定不同社会文化群体代表的主导价值取向。

关键词：职业意识，价值取向，不完整句子测试，道义论原则，医学界，安乐死

Annotation. *Professional personal development is impossible without the education of professional qualities and the acquisition of the necessary skills and abilities of the aspiring doctors. In the personality structure of a professional, the axiological component occupies a special place. At the same time, value orientations and attitudes of a certain professional community are interpreted and perceived through personal notions and concepts of aspiring specialists. In this regard, to study the attitude to the euthanasia procedure of future physicians from different sociocultural groups (the first-year medical students) seems to us up-to-date. In our case, Russian, African, and Arab students from Ryazan State Medical University named after academician IP Pavlov took part in the survey.*

The article presents the data results obtained on the basis of the "incomplete-sentence test". Analysis of the results allowed us to identify the general and the

specific in respect of the euthanasia procedure and to determine the dominant value orientations of different socio-cultural groups' representatives.

Keywords: *professional consciousness, value orientations, incomplete-sentence test, deontological principles, medical community, euthanasia.*

Personality development is impossible without the formation of professionalism, without the education of professional qualities and the acquisition of the necessary future specialist's skills and abilities. In the process of professional activity, "not only functional systems and mental processes of a person (professional perception, memory and thinking) but also the personality as a whole in certain socio-economic conditions and a socio-professional personality type with the value orientations are formed. In the structure of professional consciousness the axiological component correlates with the professional individual's morality, which is manifested in the choice of adequate ways and means in accordance with the norms of professional and general morality [10]". Deontological principles necessary for professional medical practice are fundamental for the medical community. Professional ethics, medical duty and moral issues become relevant when it comes to the problems of cloning, fetal therapy, abortion, moral problems associated with the development of "new reproductive technologies" and of the euthanasia procedure legality.

The attitude of the first-year medical students to this problem is acute. At the initial stage of training the professional consciousness foundations are laid. And the values and meanings of a future profession are perceived through personal notions and concepts, through the aspiring specialists' life experience prism. [8].

As is well known "the person's identification occurs in the process of sociogenesis. It leads to the appropriation of semantic orientations characterizing the culture of the social group" [4,135]. In this regard we consider it's necessary to identify the general and the specific in respect of the euthanasia procedure in different socio-cultural groups.

In this article we consider the comparative data analysis on the basis of the "incomplete-sentence test". The respondents had to continue the phrase "In my opinion euthanasia is…." in writing form.

A total of 54 Russian, 33 African (from Nigeria, Zimbabwe, Ghana, Swaziland, Zambia, South Africa, Liberia, Uganda, Burkina Faso, Congo, Cameroon and 43 Arab (from Tunisia, Morocco, Lebanon, Algeria) respondents took part in this survey.

In addition, the material for this study served as a free associative experiment based on a list of 15 stimuli words (illness, patient, doctor, duty, health, innovation, colleague, medicine, charity, morality, education, continuity, vocation, professionalism, euthanasia).

In the course of processing the results we identified three semantic groups. They reflect the respondents' attitude to the euthanasia problem: “for”, “against”, “ambiguous (both for and against)”. The group “against” and “ambiguous” includes the answers of all three categories of students; there are no answers “for” in the group of African students.

ARGUMENTS "FOR"

The main argument of euthanasia followers in all three groups is the desire to *ease the pain, to release the terminally ill from suffering*. In this case, euthanasia is considered as “an easy humane way of departure from life” and as “a death without sufferings” (Russian). “Euthanasia is sometimes necessary; it is a good and logical practice in critical situations. This is better than to be a patient support apparatus.” (Arab) “I believe euthanasia should be used as a last resort, when all other means have failed and when there is no neither peaceful future nor hope for the patient” (African).

Among the answers, respondents often mention the stages, forms and nature of diseases, the totality of which allows us to speak of such a specific type of disease as an end-stage or terminal disease (Lat. "terminus" – end, limit). According to students’ opinion euthanasia should be encouraged in the event of a “fatal case of the disease, loss of the vital bodily signs” (Russian), “oncological diseases of the end-stage, if the disease is 100 percent deadly” (Arab), “if a person is suffering intolerably like for example in a coma for multiple years” or “in the particular case if it’s threating to the lives of many more people than just one person (in case of a dangerous quickly spread disease).”(African)

A lot of researches are devoted to the psychology of terminally ill patients. So, for example, Dr. E. Kubler Ross an authority in the study of death and dying has described the coping mechanisms of the terminally ill. Such patients experience what is now referred to as the five stages of grief. These five stages of grief also apply to the bereaved and persons who have experienced a devastating life event. Dr. E. Kubler-Ross and her colleagues, studying the psychological state of terminal patients, created the concept of "death as a growth stage." According to this concept, “the mental state of a person who has fallen ill with a fatal illness does not remain constant, but goes through a series of stages. The stages are as follows: “denial”, “anger”, “bargaining”, “depression”, “acceptance” [3].

The human body is a complex functioning system. “Diseases of the body are a violation of the integrity of the body, a malfunction of the system, a gap in a harmoniously organized person. Among these failures and breaks, not the last place is taken by the loss of harmony in relationships both to oneself and others. There is a disharmony of the peace of mind, connected with the order and body organization” [9, 51]. At this moment, the most important thing such as a person’s life purpose is lost together with the hope of recovery, and the absence of a life purpose gives causes to the state of “existential vacuum” [5]. The *loss of hope and*

wish to live, the absence of a life purpose (Russian, African), *aversion to life and the loss of taste for life* (Arab) are one of the main respondents' arguments in the favor of the euthanasia procedure.

According to Arab and Russian students' opinion the *free* and *conscious* patient's will is a necessary condition for euthanasia. The principle of *human freedom* and *dignity* should be respected. The right of the patient is to make decisions independently and take *responsibility*. Freedom and responsibility are inseparably connected as the incarnations of subject causality [6], and if freedom acts as internal causality, then responsibility acts as awareness of the consequences of actions based on internal motives and actions performed on their basis [7].Of course, in this case we are talking about the capacity and imputability of the seriously ill patient. "Everyone is free to choose a way to die. It is impossible to decide for another person and judge the decision of another, since this is his/her life, and this is an issue for her/him"(Arab). "Euthanasia is fitting if the patient oneself approached it consciously, without coming under emotions and advice of others, if the person oneself expresses a wish to fall back on this way and if he/she is deliberately loath to keep on living." (Russian)

The argument for the admissibility of euthanasia, according to Russian and Arab students' opinion, may be the wish to secure the incurable patient's relatives against negative emotions, physical and moral pains. "Euthanasia is a happy resolution for patient's beloved ones" (Arab), it will allow the patient to "release the family from suffering, not to torture them with their anxiety and not to be a burden for a family" (Russian).

Some African students are guided by the pragmatic principle, arguing for the possibility of an artificial intervention during a serious and incurable disease. "Euthanasia helps to free hospital equipment like hospital beds and oxygen masks. For the patient's family, it also helps to save funds and some financial issues." (African)

ARGUMENTS "AGAINST"

Some African and Russian students gave a negative affective evaluation of the euthanasia procedure considering it *as a murder, as a means of encouraging the suicide.* In this case, the doctor, attempting to euthanasia, is treated as the killer or murderer. "For my own option the doctor doesn't have the right to end someone's life. It's just like a murderer taking a knife or a gun and just ends the person's life; the blood of who will be on his or her hands till death". (African)

One of the main factors determining the attitude towards euthanasia in the group of African students is the argument based upon the medial deontological principles. "*The doctor's duty* is to help, to support, to encourage, to inspire patients, to give them hope of recovery, to fight and to prolong each patient's life, not to end it or to kill", "*The goal of the doctor* is to save lives, using medicines

and technologies that can ease the pain in order to prolong life", "Attempting euthanasia in itself *dishonors* the doctor's profession which is committed to the task preserving human life". (African)

The dominant arguments of African and Arab students against euthanasia are due to respondents' religious beliefs. "As an African, I should say that our culture, customs and religion are strongly against euthanasia", "From a religious point of view, no one has the right to take one's life or to kill others. The power to dispose of human life is in the hands of God". (African) "According to our religion, euthanasia cannot become a legitimate practice. No one except God can take human's life, even with the consent of the patient. Life is sacred and precious. And only God decides when and how to die". (Arab)

The disease acquires a different meaning considered not only as a physical but also a personality challenge. Under the illness a personal experience strengthens the person, accumulates his life opportunities and, most importantly, contributes to his spiritual growth. This is the moral meaning of the disease. "The Lord sends problems in life as complex as an exam. One ought to have patience. One must fight to the finish."(Arabic) "The disease is given as a challenge from God. Sometimes God puts you in such a critical condition when you feel it's better to be dead", "Everything depends on God's will; as long as there is life, hope is alive, and there is always a chance to survive. In God we trust." (African)

Thus, the results of a comparative analysis of the respondents' answers attest to the general and the specific in respect of euthanasia in different socio-cultural groups. In all three respondents' groups the attitude towards euthanasia is ambivalent. The ambivalence lies in the framework of the moral and ethical nature and correlates with **freedom**, as the sense-making person's value. The loss of **the meaning of life** as an element of the value-motivational sphere of a person's spiritual life is the main argument *for* the euthanasia procedure among Russians, Arab and African students. In addition, euthanasia is considered in this case as an easy and "humane" way of departure from life, as an "**act of mercy**", which, apparently, is motivated by compassion, empathy of respondents towards terminally ill patients.

A doctor's duty, as a moral value, an execution of the basic non-maleficence professional principle "noli nocere" is the key argument *against* euthanasia in the consciousness of entrant African doctors. The main deontological principle in this case is **the value of human life**. Attempt to euthanasia is a violation of medical ethics; it destroys and dishonors the doctor's status.

In the value system of Arabic and African culture, **the religious factor** is an important ethical regulator [2] and determines the specificity of their attitude to the admissibility of the euthanasia procedure.

The obtained results of the research allow us to expand our ideas about the value priorities of future physicians belonging to various sociocultural groups and

to determine the directions of not only the professional, but also the spiritual and moral development of the personality of students. The formation of an integral personality of a specialist implies both the education of the necessary qualities in a certain area of activity, and the assimilation of values, meanings, basic rules and norms of the future profession. In the process of professional development of a person at the initial stage of education, value orientations act as driving forces for the development of personal and professional consciousness of students, since a set of value orientations orients people in the socio-political world, stimulating various types of their practical and spiritual activities [1].

It is the attitudes in professional medical activity that largely determine the solution of complex moral and ethical issues, one of which is the question of the attitude to the euthanasia procedure. In the context of the fundamental change in the values of the professional consciousness of doctors, when there is "a gradual transfer of medicine into the market space of services" [10, 118], the study of the value orientations of aspiring doctors is up-to-date and timely.

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上海证券交易所话语中反义关系的构建（基于2018年上海证券交易所概况）
CONSTRUCTION OF ANTONYMY RELATIONS IN THE DISCOURSE OF SHANGHAI STOCK EXCHANGE (BASED ON 2018 SHANGHAI STOCK EXCHANGE FACTBOOK)

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注解。本文通过章节和段落分析，在上海证券交易所概况的语音表现形式的金融经济学话语中提供了多个反义关系构建的例子。已经得出结论，在2018年发布的这份文件中，矛盾的条款被列入2017年市场回顾和股票市场，相反的条款位于市场评论章节，不相容的条款位于3章 – 2017年市场回顾，股票市场章节和上市公司章节，相反的条款在股票市场章节中提供，补充条款可以在上市公司章节中找到，反向条款没有记录在单个章节中，但是来自章节2017年市场评论和股票市场。关于上证50指数段中的股票市场章节，市场上限和成分股权衡，以及流通股数量（10,000股）/可交易股票市场上限（人民币10,000元）/关闭中的栏目元素，仍然是一个悬而未决的问题。 SSE 50指数中的价格（人民币）/权重根据它们所代表的价值排列出相反的逻辑 – 语义关系。目前还不清楚上海证券交易所的事实书话语是否允许构建反义同义词（对比关系）并创造松散对比的关系。

关键词：反义关系构建，矛盾，矛盾，不相容，转换，互补，逆转，金融经济学话语，上海证券交易所，实况报

Annotation. *The article provides multiple examples of construction of antonymy relations in the discourse of financial economics created in speech manifestation of Shanghai Stock Exchange Factbook, distributed by chapters and paragraphs. It has been concluded that in this document released in 2018 contradictory terms are placed in Chapters 2017 Market Review and Stock Market, contrary terms are located in Market Review Chapter, incompatible terms seat in 3 Chapters – 2017 Market Review, Stock Market Chapter and Listed Companies Chapter, converse terms are presented in Stock Market Chapter, complementary terms can be found in Listed Companies Chapter, reverse terms have not been recorded in single chapter, however were derived from Chapters 2017 Market Review and Stock Market. It has remained an open question whether in Stock Market Chapter, Market Caps and Weighs of Constituent Stocks in SSE 50 Index Paragraph, col-*

umn elements under the titles Number of Tradable Shares (10,000 shares)/ Market Cap of Tradable Shares (RMB 10,000)/ Closing Price (RMB)/ Weight in SSE 50 Index create contrary logico-semantic relations lined up according to the values they signify. It has also remained unclear whether Shanghai Stock Exchange fact book discourse allows to construct antonymy-synonymy blocks (contrasted relations) and create loosely contrasted relations.

Keywords: *construction of antonymy relations, contradictories, contraries, incompatibles, conversives, complementaries, reversives, discourse of financial economics, Shanghai Stock Exchange, Fact book.*

As is known, in the discourse of financial economics antonymy relations can be constructed in 8 ways – contradictory, contrary, incompatible, converse, complementary, reverse, contrasted and loosely contrasted [1, p. 272; 2, pp. 26a – 28a; 3, pp. 94-131].

In the discourse of Shanghai Stock Exchange, Shanghai Stock Exchange Fact book 2018, there can be found numerous examples of contradictory terms. If we distribute them by chapters and paragraphs, they occur in 2017 Market Review Chapter, Market Performance Paragraph: (1) *The total stock market capitalization was RMB 33.1 trillion,* ***up*** *by 16.4% from 2016*, (2) *Stock turnover was RMB 51.1 trillion, or a daily average of RMB 209.53 billion,* ***up*** *by 1.9% from 2016*, (3) *In 2017, SSE Composite Index opened the year at 3,105.31 points and* ***rose*** *6.56% to close the year at 3,307.17 points after touching a yearly high of 3,450.5 points and a yearly* ***low*** *of 3,016.53 points* [4, p. 5]; Stock Market Chapter, Trading System Paragraph: (4) ***Trading system-based business/ Non-trading system-based business*** [4, p. 13]; Stock Market Chapter, Base Day, Base Period Index and Launch Date Paragraph (Thematic indices Section): (5) ***SSE Private-owned Enterprises Dividend Index/ SSE State-owned Enterprises Dividend Index*** [4, p.37].

Contrary, incompatible, converse, complementary and reverse terms also occur.

Contrary terms are placed in 2017 Market Review Chapter, Market Performance Paragraph: (6) *SSE 50 Index started the year at 2,285.27 points and* ***surged*** *25.08% to end the year at 2,860.44 points after hitting a yearly high of 3,038.28 points and a yearly low of 2,282.24 points*; (7) *SSE 180 Index opened the year at 7,225.26 points and* ***jumped*** *19.69% to finish the year at 8,647.03 points after making a yearly high of 9,133.43 points and a yearly low of 7,192.87 points* [4, p. 5].

Incompatible terms are located in the following places: 1) in the 2017 Market Review Chapter, Transactions Paragraph: (8) ***stocks/ funds/ bonds*** [4, p. 9.], 2) in the Stock Market Chapter, Trading Relations Paragraph: (9) ***stocks that are placed under delisting risk alert/ stocks whose listing has been resumed after suspension (ST)/ stocks that have been relisted (ST) after being delisted/ stocks that are placed under other risk alert for other circumstances*** [4, p. 14], 3) in the

Stock Market Chapter, Breakdown of Trading-related Services Paragraph, Type of Service Subparagraph: (10) ***offering/ entitlement/ trading/ relationship*** [4, p. 21].

4) In the Stock Market Chapter, SSE Fee and Tax Rate Schedules Paragraph, Fees Charged by SSE Subparagraph – Fee Item Column – (11) ***initial listing fee/ handling fee/ annual listing fee,*** Payer and Receiver Column – (12) ***Paid by SEE Members, etc. to SSE/ Paid by both parties to SSE/ Paid by listed companies to SSE*** [4, p. 23], 5) in the Stock Market Chapter, Base Day Paragraph, Base Period Index and Launch Date Subparagraph, Indices Column: (13) rows ***Composite Indices/ Market-size Indices/ Sector Indices/ Style Indices/ Strategy Indices/ Thematic Indices/ Bond Indices/ Fund Indices/ Customized Indices/ Dividend Point Indices/ SSE Volatility Indices*** [4, pp. 34-39].

Each division contains incompatible terms as well: Composite Indices Subcolumn – (14) rows ***SSE Composite Index/ SSE New Composite Index/ SSE A-share Index/ SSE B-share Index/ SSE Sector Sub-indices*** (contains 5 indices in speech constructed as incompatible terms), (15) ***SSE Medium Enterprise Composite Index, SSE Free-float Index***; Market-Size Indices Subcolumn – (16) rows ***SSE 180 Index/ SSE 50 Index/ SSE Mega-cap Index/ SSE MidCap Index/ SSE SmallCap Index/ SSE Mid&Small Cap Index/ SSE Large&Mid&Small Cap Index/ SSE 380 Index/ SSE Market Value Top 100 Index/ SSE 150 Index/ SSE 100 Index*** [4, p. 34].

Sector Indices Subcolumn – (17) rows ***SSE Sector Index Series*** (involves 10 indices in speech created as incompatible terms)/ ***SSE 380 Sector Index Series*** (contains 10 indices in speech constructed as incompatible terms)/ ***SSE 180 Sector Index Series*** (involves 10 indices in speech created as incompatible terms)/ ***SSE Securities Sector Index/ SSE 180 Financials Index/ SSE Industrial Index Series*** (contains 5 indices in speech constructed as incompatible terms) [4, p. 34].

Style Indices Subcolumn – (18) rows ***SSE 180 Style Indices*** (contains 4 indices in speech constructed as incompatible terms), ***SSE All-share Style Indices*** (involves 4 indices in speech created as incompatible terms), ***SSE 380 Style Indices*** (contains 4 indices in speech constructed as incompatible terms) [4, p. 34].

Strategy Indices Subcolumn – rows (19) ***SSE Sector Hierarchy Equal Weight Indices*** (involves 10 indices in speech created as incompatible terms)/ ***SSE 50 Equal Weight Index/ SSE 180 Equal Weight Index/ SSE 180 Sector Hierarchy Equal Weight Index/ SSE Fundamental 200 Index/ SSE Fundamental 300 Index/ SSE Fundamental 500 Index/ SSE 380 Equal Weight Index/ SSE 50 Fundamental Weighted Index/ SSE 180 Fundamental Weighted Index/ SSE 380 Fundamental Weighted Index/ Volatility Weighted Index/ SSE 380 Volatility Weighted Index, SSE 180 High Beta Index, SSE 180 Low Beta Index, SSE 380, SSE 380 Low Beta Index, SSE 180 Dynamic & Stability Index*** (contains 2 indices in speech constructed as incompatible terms), ***SSE 380 Dynamic & Sta-***

bility Index (involves 2 indices in speech created as incompatible terms), ***SSE Dividend Low Volatility Index/ SSE Dividend Value Index/ SSE 180 Leveraged 2X Index/ SSE 180 Inversed Index/ SSE 180 Inversed Leveraged 2X Index/ SSE 50 Volatility Control 20% Index/ SSE 50 Volatility Control 10% Index/ SSE 180 Volatility Control 20% Index***, etc. [4, pp. 35-36].

Thematic Indices Subcolumn – rows ***SSE Dividend Index, SSE Corporate Governance Index, SSE 180 Corporate Governance Index, SSE 180 Infrastructure/Natural Resource/Transportation Index, SSE Central SOEs 50 Index, SSE Social Responsibility Index, SSE Private-owned Enterprises 50 Index, SSE Local State-owned Enterprises 50 Index, SSE State-owned Enterprises 100 Index, SSE Overseas-listing A shares Index, SSE China Manufacture 2025 Index, SSE Internet plus Index, SSE Internet of things Index, SSE Shanghai Enterprises Index, SSE Cyclical Industry 50 Index, SSE Non-cyclical Industry 100 Index, SSE Industry Top Index, SSE Commodity Stock Index, SSE Emerging Industries Index, SSE Natural Resource Index, SSE Consumer 80 Index, SSE Resource 50 Index, Industry Chain Index Series*** (contains 3 indices in speech constructed as incompatible terms), (20) ***SSE High-End Equipment Manufacturing 60 Index, SSE Investment Commodity Index, SSE Consumer Commodity Index, SSE Sustainable Development Industry Index, SSE Healthcare Theme Index, SSE Agriculture Theme Index, SSE Consumer 50 Index, SSE High and New Technology Enterprises Index, SSE Banks Index, SSE Competitive Industry Index Series (involves 3 indices in speech created as incompatible terms), SSE Leading Consumption and Services Index, SSE 180 Dividend Index, SSE 380 Dividend Index, SSE State-owned Enterprises Dividend Index, SSE Central State-owned Enterprises Dividend Index, SSE Private-owned Enterprises Dividend Index, SSE Environmental Protection Industry Index, SSE Regional Industry Top Index Series (***involves 6 indices in speech created as incompatible terms)***, SSE Strategic Information Industry Index, SSE Culture Industries Index, SSE Dividend Return Index, SSE Dividend Potential Index, SSE Industrials Dividend Index Series (10 indices in speech constructed as incompatible terms), SSE Urbanization Index Series (7 indices in speech created as incompatible terms)***, etc. [4, pp. 36-38].

Bond Indices Subcolumn – (21) rows ***SSE Government Bond (T-bond) Index, SSE Enterprise Bond Index, SSE Corporate Bond Index, SSE Detachable Convertible Bond Index, SSE Enterprise Bond 30 Index, SSE Convertible Bond Index, SSE 5-Year China Treasury Note Index, SSE Credit Bond 100 Index, SSE 10-Year China Treasury Note Index, SSE 5-Year Credit Bond Index, SSE Corporate Bond Index Series*** (contains 7 indices in speech constructed as incompatible terms), ***SSE Medium Term Medium-High Yield Cross Market Credit Bond Index, SSE Urban Construction Investment Bond Index, SSE Pledgeable***

Urban Construction Investment Bond Index, SSE Extra Long Treasury Bond Index, SSE 10-Year Local Government Bond Index, SSE Green Bond Index, SSE Green Corporate Bond Index, SSE 3-5 Year Collateralizable Medium-High Grade Credit Bond Index, Customized Indices Subcolumn – rows SSE Fortune Small-mid Index, SSE 50AH Select Index, SSE 180AH Select Index, SSE Cyclical industry Bond Index [4, pp. 38-39].

Dividend Point Index Subcolumn – (22) rows ***SSE 50 Dividend Point Index*** and ***SSE 180 Dividend Point Index*** [4, p. 39].

6) in the Listed Companies Chapter, Number of Listed Companies by Sectors (2017 Year-end) Paragraph, Industry Column: (23) rows ***Farming, Forestry, Animal Husbandry & Fishery/ Mining/ Manufacturing/ Electricity, heat, gas and water production and supply/ Construction/ Wholesale & retail/ Transportation, storage and post/ Lodging and Catering/ Information transmission, software and IT services/ Financial/ Real estate/ Leasing and business services/ Scientific research and technical service/ Water conservancy, environment and public facilities management/ Education/ Health and social work/ Culture, sports and entertainment/ Conglomerates*** [4, p. 86].

7) in the same Chapter, Number of Listed Companies by Regions (2017 Year-end), Region Column: (24) rows ***Anhui/ Beijing/ Fujian/ Gansu/ Guangdong/ Guangxi/ Guizhou/ Hainan/ Hebei/ Henan/ Heilongjiang/ Hubei/ Hunan/ Jilin/ Jiangsu/ Jiangxi/ Liaoning/ Inner Mongolia/ Ningxia/ Qinghai/ Shandong/ Shanxi/ Shaanxi/ Shanghai/ Sichuan/ Tianjin/ Tibet/ Xinjiang/ Yunnan/ Zhejiang/ Chongqing*** [4, p. 87].

8) In Stock Market Chapter, Market Caps and Weighs of Constituent Stocks in SSE 50 Index Paragraph, table title row: (25) ***Code/ Short Name/ Number of Tradable Shares (10,000 shares)/ Market Cap of Tradable Shares (RMB 10,000)/ Closing Price (RMB)/ Weight in SSE 50 Index (%)*** [2, p. 41]; each column contains incompatible terms as well: Code Column – (26) ***600000/ 600016/ 600019/ 600028/ 600029/ 600030/ 600036/ 600048/ 600050/ 600104/ 600111/ 600309/ 600340/ 600518/ 600519/ 600547/ 600606/ 600837/ 600887/ 600919/ 600958/ 600999/ 601006/ 601088/ 601166/ 601169/ 601186***. etc. [4, pp. 41-42].

Short Name Column (names of companies) – (27) ***Pudong Development Bank/ Minsheng Bank/ Baoshan Iron & Steel/ China Petroleum & Chemical/ China Southern Airlines/ CITIC Securities/ China Merchants Bank/ Poly Real Estate/ China Unicom/ SAIC Motor/ Northern Rare-Earth/ Yantai Wanhua/ China Fortune/ Kangmei Pharmaceutical/ Kweichow Moutai/ Shandong Gold/ Greenland/ Haitong Securities/ Yili Group/ Bank of Jiangsu/ Orient Securities/ China Merchants Securities/ Daqin Railway/China Shenhua/ Industrial Bank/ Bank of Beijing/ China Railway Construction/ Guotai Junan Securities/ Bank of Shanghai/ Agricultural Bank of China/ Ping An Insurance/ Bank of***

Communications/ New China Life Insurance/ China Railway/ Industrial and commercial bank/ China Pacific Insurance/China Life/ China State Construction Engineering/ Power Construction Corporation/ Huatai Securities/ CRRC/ China Communications/ Everbright Bank/ Petrochina/ Zheshang Securities/ China Galaxy Securities/ China National Nuclear Power/ Bank of China/China Shipbuilding/ China Molybdenum [4, pp. 41-42].

Number of Tradable Shares (10,000 shares) Column – (28) ***2810376/ 2955177/ 2208973/ 9555777/ 702265/ 981466/ 2062894/ 1173634/ 2119660/ 1102557/ 363307/ 259480/ 295495/ 440319/ 125620/ 145150/ 322337/ 809213/ 603337/ 591085/ 312615/ 490370/ 1486679/ 1649104/ 1905234/ 1824801/ 1150325/ 473269/ 370690***, etc. [Ibid] (it remains an open question whether these units structured according to the values they express construct contrary antonymy relations; for more information see also contraries on p. 1).

Market Cap of Tradable Shares (RMB 10,000) Column (RMB 10,000) – (29) ***35382639/ 24793934/ 19085523/ 58576914/ 8370999/ 17764538/ 59865197/ 16606922/ 13417446/ 35325915/ 5300643/ 9844678/ 9275578/ 9845537/ 87618540/ 4525779/ 2353059/ 10414573/ 19421415/ 4344472/ 4332851/ 8414748/ 13484180/ 38209735/ 32369920/ 13047328/ 12814615,*** etc. [Ibid]. (it remains an open question whether these units structured according to the values they express construct contrary antonymy relations; for more information see also contraries on p. 1).

Closing Price (RMB) Column – (30) ***12.59/ 8.64/ 6.13/ 11.92/ 18.10/ 29.02/ 14.15/ 6.33/ 32.04/ 14.59/ 37.94/ 31.39/ 22.36/ 697.49/ 31.18/ 7.30/ 12.87/ 32.19/ 7.35/ 13.86/ 17.16/ 9.07/ 23.17/ 16.99/ 7.15/ 11.14/ 18.52/ 14.18/ 3.83/ 69.98/ 6.21/ 70.20/ 8.39/ 6.20/ 41.42/ 30.45/ 9.02/ 7.22/ 17.26/ 12.11/ 12.80/ 4.05/ 8.09/ 16.62/ 10.51/ 7.35/ 3.97/ 6.03/ 6.88*** [Ibid] (it remains an open question whether these units structured according to the values they express construct contrary antonymy relations; for more information see also contraries on p. 1); Weight in SSE 50 Index (%) Column – ***2.97/ 4.00/ 1.54/ 1.31/ 0.84/ 2.88/ 5.95/ 1.97/ 1.17/ 2.20/ 0.65/ 1.05/ 0.74/ 1.31/7.28/ 0.46/ 0.53/ 2.10/ 3.93/ 1.02/ 0.87/ 0.78/ 1.08/ 0.93/ 4.26/ 2.08/ 1.03/ 1.41/ 0.25/ 2.91/ 15.42/ 3.41/ 1.17/ 0.95/ 2.67/ 2.69/ 1.03/ 2.70/ 0.67/ 1.13/ 1.77/ 0.39/ 1.30/ 1.05/ 0.12/ 0.14/ 0.69/1.67/1.13/ 0.37*** [Ibid] (it remains an open question whether these units structured according to the values they express construct contrary antonymy relations; for more information see also contraries on p. 1); 9) in Stock Market Chapter, Market Caps and Weighs of Constituent Stocks in SSE 180 Index, table title row: (31) ***Code/ Short Name/ Number of Tradable Shares (10,000 shares)/ Market Cap of Tradable Shares (RMB 10,000)/ Closing Price (RMB)/ Weight in SSE 50 Index (%)*** [4, p. 42]; each column contains incompatible terms as well: Code Column – (32) ***600000/ 600008/ 600009/ 600010/ 600015/ 600016/ 600018/ 600019/ 600021/ 600023/***

600028/ 600029/ 600030/ 600031/ 600036/ 600048/ 600050/ 600060/ 600061/ 600066/ 600068/ 600079/ 600085/ 600089/ 600098/ 600100/ 600104/ 600109/ 600111/ 600115/ 600118/ 600153/ 600155/ 600158/ 600170/ 600177/ 600196/ 600208/ 600219/ 600221, etc. [4, pp. 43-48].

Short Name Column (names of companies) – (33) ***Pudong Development Bank/ Beijing Capital/ Shanghai Airport/ Baotou Steel/ Hua Xia Bank/ Minsheng Bank/ Shanghai International Port/ Baoshan Iron & Steel/ Shanghai Electric Power/ Zheneng Electric Power/ China Petroleum & Chemical/ China Southern Airlines/ CITIC Securities/ Sany Heavy Industry/ China Merchants Bank/ Poly Real Estate/ China Unicom/ Hisense Electric/ SDIC Capital/ Zhengzhou Yutong/ Gezhouba/ Humanwell Healthcare/ Tongrentang/ Tebian Electric/ Guangzhou Development/ Tsinghua Tongfang/SAIC Motor/ Sinolink Securities/ Northern Rare-Earth/ China Eastern Airlines/ China Spacesat/ Xiamen C & D/ Hebei Baoshuo/ China Sports/ Shanghai Construction/ Yongor/ Fosun Pharmaceutical/ Xinhu Zhongbao/ Nanshan Aluminum/ Hainan Airlines Holding/ YTO Express/ Beijing Urban Construction/ Aisino/Hengrui Medicine/ Grand Automotive/ Yantai Wanhua/ Guangzhou Baiyunshan/ China Fortune/ Jiangxi Copper***, etc. [Ibid], Number of Tradable Shares (10,000 shares) Column – (34) ***2810376/ 482061/ 109348/ 2203883/ 1282269/ 2955177/ 2275518/ 2208973/ 213974/ 1360069/ 9555777/ 702265/ 981466/ 759381/ 2062894/ 1173634/ 2119660/ 130848/ 196237/ 190348/ 460478/ 105755***, etc. [Ibid].

Converse terms are placed in the Stock Market Chapter, SSE Fee and Tax Rate Schedules Paragraph, Subparagraphs Fees Charged by SSE and Taxes collected by SSE: (34) ***payer/ receiver*** [4, pp. 22, 26].

Complementary terms can be found in Listed Companies Chapter, Issuance Conditions for IPOs Paragraph, Finance and Accounting Division: ***asset-liability*** *structure* [4, p. 72].

Reverse terms have not been recorded in single Chapter, however they can be derived from 2 places – 2017 Market Review Chapter, Securities Issuance and Listing Paragraph and Stock Market, Trading and Relations Paragraph: (35) ***listing, relisting, delisting*** [4, pp. 6, 14].

Thus, in the discourse of Shanghai Stock Exchange constructed in Factbook released in 2018, contradictory terms are placed in 2017 Market Review Chapter (Market Performances Paragraph) and Stock Market Chapter (Trading System Paragraph and Base Day, Base Period Index and Launch Date), contrary terms are located in Market Review Chapter (Market Performances Paragraph), incompatible terms can be found in 2017 Market Review Chapter (Transactions Paragraph), Stock Market Chapter (Breakdown of Trading-related Services Paragraph, SSE Fee and Tax Rate Schedules Paragraph, Base Day Paragraph Market Caps and Weighs of Constituent Stocks in SSE 50 Index Paragraph), and the Listed Compa-

nies Chapter (Number of Listed Companies by Sectors (2017 Year-end) Paragraph and Number of Listed Companies by Regions), converse terms are presented in Stock Market Chapter, SSE Fee and Tax Rate Schedules Paragraph, reverse terms have not been recorded in single chapter, however were derived from Chapters 2017 Market Review and Stock Market.

It remains an open question whether Shanghai Stock Exchange fact book discourse allows to construct antonymy-synonymy blocks (contrasted relations) and create loosely contrasted relations. It has remains unclear whether in Stock Market Chapter, Market Caps and Weighs of Constituent Stocks in SSE 50 Index Paragraph, column elements under the titles Number of Tradable Shares (10,000 shares)/ Market Cap of Tradable Shares (RMB 10,000)/ Closing Price (RMB)/ Weight in SSE 50 Index create contrary logico-semantic relations lined up according to the values they signify.

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生物反应活动点的数据，算法和结果统计回收的编程
MATHEMATICS, ALGORITHMS AND PROGRAMMING OF STATISTICAL RECYCLING OF FINDINGS BY OF BIOFACT ACTIVE POINTS

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抽象。　　在本文中，使用igloreflexotherapy的电诊断方法，J.在Nakatia的Riodoraku系统中基于电子生物燃料点确定糖尿病中的葡萄糖量，并找到它们之间的数学联系并最终创建数学模型　无创血糖仪。　建立适当模型的第一步是获得关于糖尿病中葡萄糖水平变化的完整信息，统计处理和从电诊断电阻检测器实验获得的数据分析。

Abstract. *In this article, using the electro-diagnostic method of igloreflexotherapy, J. Determining the amount of glucose in diabetes mellitus on the basis of electron biofuel points in the Riodoraku system of Nakatia, and finding mathematical connections among them and ultimately creating a mathematical model for noninvasive glucometer. The first step in building an adequate model is to get complete information on the change in glucose levels in diabetes mellitus, the statistical processing and analysis of data obtained from experiments on electrodiagnostic resistance detectors.*

Nowadays, human beings have argued that the models underway in the body as a cybernetic system give positive results, and that they need to be deepened and expanded in their research. The results of the research and literature review show that in the on-line mode of diagnostics and treatment of diabetes (TD) there is a wide range of igloreflexotherapy (IRT) methods to determine the amount of glucose in the blood and to identify the type of treatment therapies The main objective of this article is to develop an information support system, including functions.

As you know, the human body is a complex system with a set of biofact active points(BFP). The processing of the numerical data, measured by biofuel points, requires the use of the theory of nontraditional headings. It is crucial to determine the amount of glucose in the blood based on IRT by creating mathematical, algorithmic, and software that evaluates the measured number of data and in the non-free environment. To date, the presence and role of glucose in the human body, the normal distribution of blood, and the presence of invasive and non-invasive glucose metabolites that monitor the progression of glucose levels in the TD, and the major drawbacks of these are the biophysics of the BFN using the IRT-based diagnostic equipment (BDE) measurement, the connection between the two parameters (EG in the blood glucose + BFN) is eliminated from the point of view of medicine and cybernetics. The first task of the research is to create an automated neutral non-invasive glucometer mathematical model (ANGMM) in the body that determines the origin of diabetes mellitus in glucose levels in the blood. The use of IRP therapeutic procedures in iperglycemia in TD is a second global issue, which seeks to overestimate and decrease the BFPs electrical resistance (ER), with the creation of automated diagnostic and therapeutical complex (ADTC) system.

The stage of the clinical trials of ANGMM using the BFP (see Table 1) in J. Nakatani's Riodoraku method and the processing of the results obtained by mathematical statistics is as follows:

• carrying out experiments on measuring blood glucose content (MG %) in the BFP in the ER and the biochemical method of the TD;

• statistical processing, datasheet, graphic, interval methods of analysis and processing using the spline methods;

• development of mathematical criteria for the differentiation process based on the amount of biophysical parameters in the informative BFP between healthy men and individuals 1 and 2 of TD.

Table 1.

Informative BFPs in the Riodoraku -system

№	The name of the meridians	Order of BFP on meridians	BFPs Chinese name
1.	Lung	P-9	Tay-yuan
2.	Big colon	Gi-4	Xe- gu
3.	Stomach	E-42	Chun -yan
4.	Pancreas	Rp-3	Tay-bay
5.	Heart	C-7	SHen-men
6.	Small colon	IG- 4	Van-gu
7.	Urinary tract system	V-64	Szin-gu
8.	Liver	P- 3	Tay-si
9.	Perikard	Mc-7	Da-lin
10.	Three heaters	Tr- 4	Yan-chi
11.	Tufts	Vb- 40	Suy-cuy
12.	Divorced	F-3	Tay-chun

In order to solve the above problem, 1,2 out-of-kind patients and 1,170 healthy people were treated at the endocrinology department of the 1st Medical Clinic of the Tashkent Medical Academy (see Figure 2).

Methods used for the creation of ANGMM and APTM, their algorithms and CDS started at the Tashkent University of Information Technology (TUIT) and completed at Jizzakh Polytechnic Institute

Table 1.

Information on the number 1.2 of the TD and the number of observations in healthy subjects

Groups	Class	The number	Experience the number	Time
Healthy people	A	80	120	8:30
Type 1 TD (insulin-dependent diabetic)	Б	200	750	8:30
Type 2 TD (insulin-dependent diabetic)	B	90	880	8:30
Total number of views:		370	1750	

The following form of access was developed for experimental observations (see Table 3) and two observations were simultaneously performed on that table.

Table 3.

Form of Glucose Quantity in Blood and BFN EQ Experiment Form

№	The amount of glucose in the blood, mg, %	X_1	X_2	…	X_n
1	Y_1	X_{11}	X_{12}	…	X_{n1}
2	Y_2	X_{12}	X_{22}	…	X_{n2}
.....	…	…	…	…	…
m	Y_m	X_{m1}	X_{m1}	…	X_{mn}

Based on the tables 1 and 2 above, the following formulas were utilized in the statistical processing of data for each class (in our scientific work divided into groups A, B, and B) to comply with mathematical statistics.

The mean arithmetic value of the parameters obtained (the amount of glucose in the blood and the ER in the BFP) is calculated using the formula

$$M_y = \frac{1}{m}\sum_{i=1}^{m} y_1; M_{xi} = \frac{1}{m}\sum_{i=1}^{m} X_{ij}, \quad (1)$$

where , Y- is the amount of glucose in the blood;

The amount of ER obtained from the BFP in Xi.

We deduce the average arithmetic value from the formula below

$$S_y = \sqrt{\frac{1}{m-1}\sum_{i=1}^{m}(Y_i - M_y)^2};$$

$$S_{xy} = \sqrt{\frac{1}{m-1}\sum_{i=1}^{m}(X_j - M_{xj})^2}; \quad (2)$$

Using the formula (2), all parameter values serve as a formula evaluating the deviation of the arithmetic mean of this parameter.Parameters dispersion is calculated using the following formula

$$D_y = \frac{1}{m-1}\sum_{i=1}^{m}(Y_i - M_y)^2; D_{xj} = \frac{1}{m-1}\sum_{i=1}^{m}(X_j - M_{xj})^2; \quad (3)$$

The value of the arithmetic mean of the error is determined by the following formula

$$T_y = \sqrt{D_y / m}; \; T_{xj} = \sqrt{D_{xj} / m} \quad (4)$$

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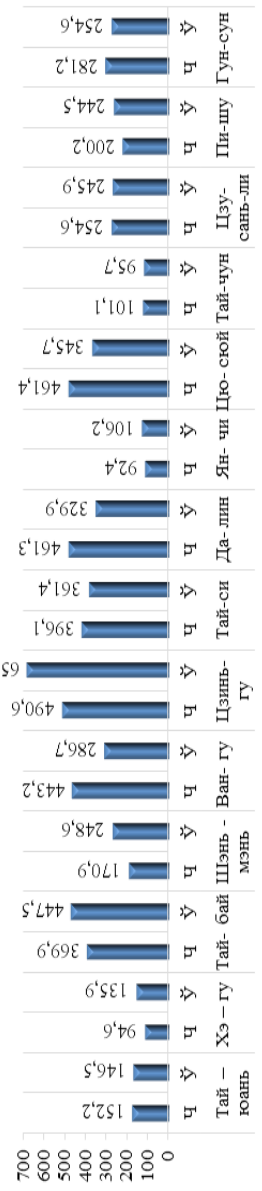
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659,4
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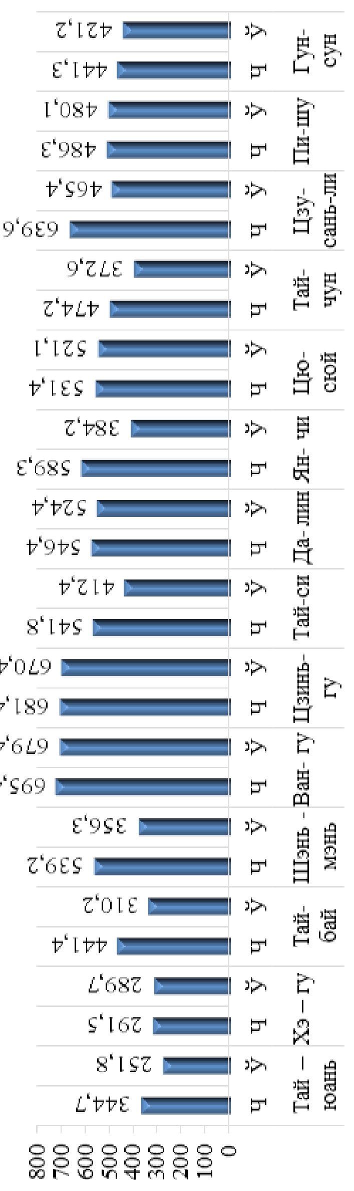
Fig-3.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Ван- гу
695,4
679,4
Цзинь- гу
681,4
670,4
Тай-си
541,8
412,4
Да- лин
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524,4
Ян- чи
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384,2
Цю- сюй
531,4
521,1
Тай- чун
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372,6
Цзу- сань-ли
639,6
465,4
Пи-шу
486,3
480,1
Гун- сун
441,3
421,2
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100
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500
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700
800

Fig-4.

The algorithm and software for the statistical processing results using the formulas (1), (2), (3) and (4) above were created in C ++ programming languages. Graphic presentation of the mean arithmetic value of the ER in BFP in healthy people under average 24 years of age shows that the graphic representation of the mean arithmetic value of the ER in BFP is shown in Figure 1 below, and the mean age is 40 in healthy people And graphics in the 3.4 drawings by type 1,2 of TD.

By using the interval method, the results of the ER in healthy BFPs were taken as the "normal corridor of healthy people", on the basis of which scientific observation of the comparison of TD results in patients with type 1 outcome was carried out, below the ER "norm corridor" in some BFP less and mostly in the upper part, and are shown in Figures 5 and 6 below.

The results of statistical processing using the formulas (1), (2), (3) and (4) above, graphic images from above in Figures 1, 2, 3, 4, and interval conclusions made in Figures 5 to 6 the relationship between glucose content and ER in BFPs is matched by mathematical laws (see Figure 8). and as a result, it has been proven that ANGMM models can be created.

In summary, as a result of scientific experiments, the following results were determined:

1. Processing data based on computer-based computational experiments, the limits of vibrations of glucose and ER levels in healthy people, the appropriate minimum and maximum values of the values (ER in informative BFP 139.0), and it was recognized as a "Healthy Norm Corridor".

2. According to the vibration limits in the TD, when the glucose content in the blood was 6.5- 21 mmol / l, the ER in the informative BFN was changed from 16.4 kOm to 695.4 kOm.

3. Calculation experiments have shown that uncertainty in the intersection of the corridors of norms, ie, the emergence of an unstable environment, is based on the effectiveness of the theory of nontraditional collections.

4. The need for biofysical parameters of BFPs and healthy glucose levels in TD and healthy people, as a result of initial data processing, was scientifically justified in its mathematical models.

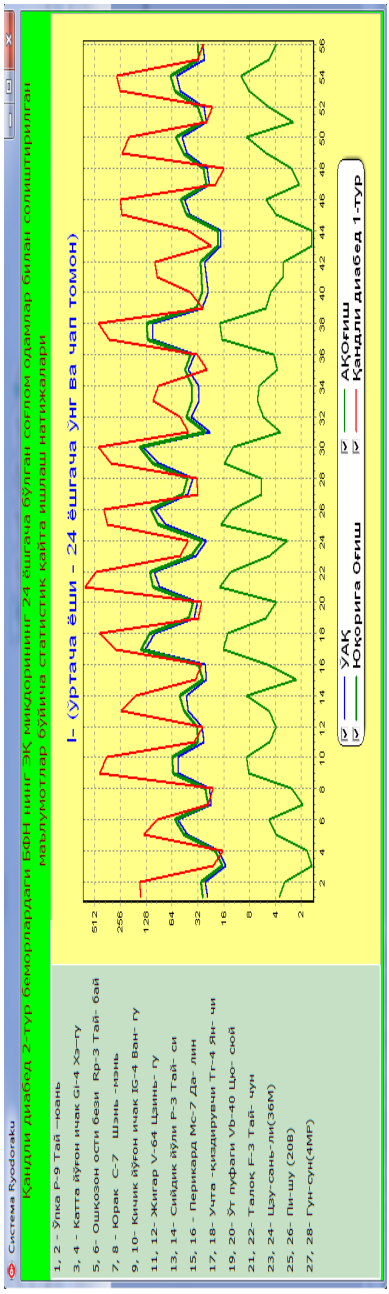


Figure 5. *Comparison schedule of healthy men with type 1 and type 24 of TD*

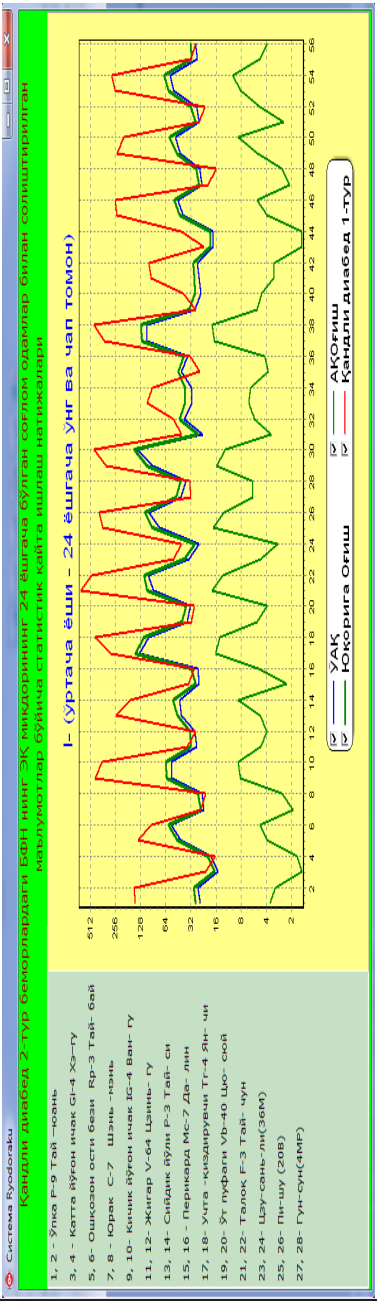


Figure 6. *Results of the comparison between the 2 nd type of QD and the healthy 40-year-old*

жойлашганлиги кузатилди ва қуйида 5, 6 - расмларда келтирилган

The statistical processing algorithm and its main window in C ++ are shown in Figure 7 below.

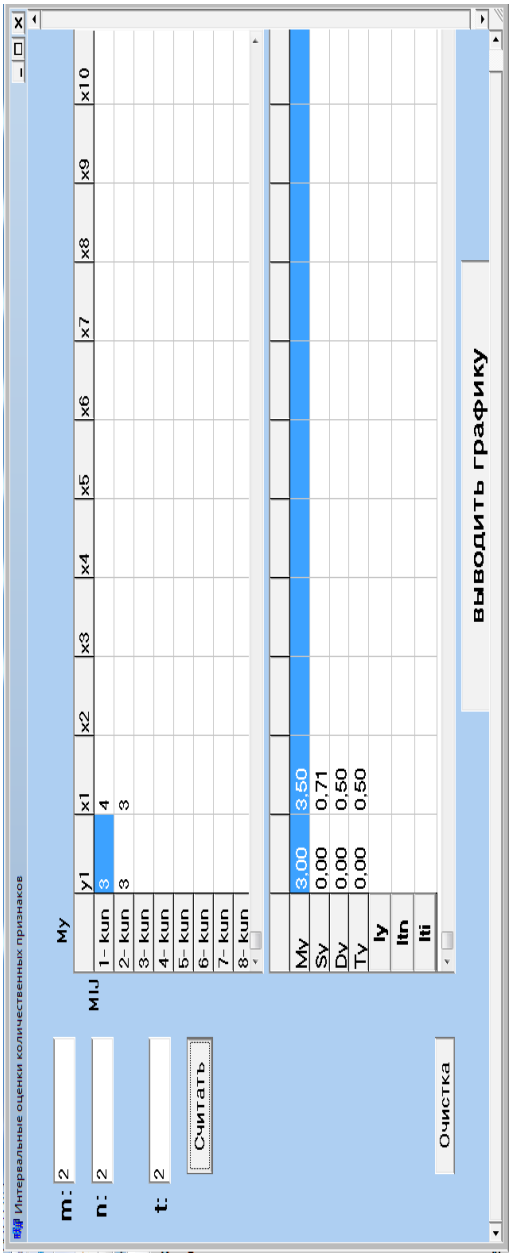
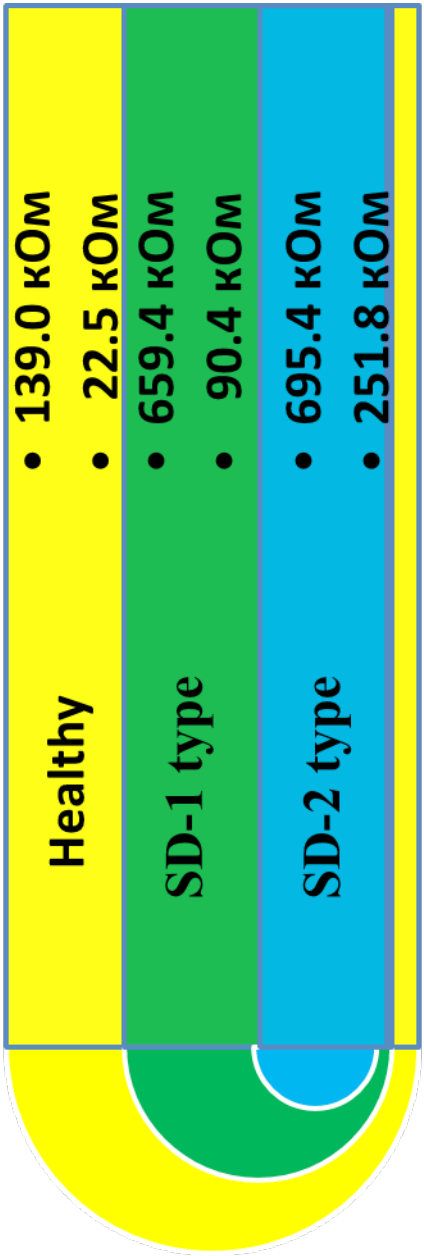


Figure 7. *The main window of the Statistical Processing Program*



Picture 2.8. *The interval of the TQ in the 1,2 and the healthy people in the BFP*

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仔猪血小板的止血特性在6至20天之间

HEMOSTATIC CHARACTERISTICS OF PLATELETS IN PIGLETS BETWEEN 6 AND 20 DAYS OF LIFE

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抽象。血小板被正确地认为是止血的非常生理学重要的组成部分。它们的活性的生理变化显着影响微血管中的微循环过程，并因此影响所有器官中的代谢过程。奶喂养阶段被认为是仔猪早期个体发育的生理上非常重要的时期。已经认识到，所有生产性动物的组织的进一步生长和发育阶段的最佳强度在很大程度上取决于在这些时期内血小板止血的功能准备的严重性。在这方面，为了发展仔猪的生理学，有必要继续研究乳制品营养阶段的血小板功能的各个方面。这种需求与迫切需要继续寻找加速猪发育的方法有关。只有依靠仔猪深入止血研究的结果，才能在现代养猪业中实现这种效果。结果发现，在供乳阶段的仔猪中，血小板止血增加。该过程的主要基础应该被认为是血小板中受体和受体后过程的活动动力学。它们的活化提供了这些形成元素中粘附，聚集和分泌的强化。显然，在供乳阶段期间仔猪中血小板特性的激活通过维持器官中的最佳微循环而在任何环境条件下产生稳态的条件，足以满足活跃生长的生物体的需要。

关键词：粘附，聚集，分泌，血小板，仔猪，乳营养期。

Abstract. *Platelets are rightly considered to be a very physiologically significant component of hemostasis. Physiological changes in their activity significantly affect the course of microcirculation in microvessels and, thus, the metabolic processes in all organs. The phase of dairy feeding is considered to be a very physiologically significant period of early ontogenesis in piglets. It is recognized that optimum intensity of further stages of growth and development of tissues of all productive animals depends strongly on the severity of functional readiness of platelet hemostasis during these periods. In this regard, for the development of the physiology of piglets,*

it is necessary to continue the study of various aspects of platelet functioning at the stage of the dairy nutrition phase. This need is associated with a very urgent need to continue the search for approaches to accelerate the development of pigs. This effect can be achieved in modern pig breeding only by relying on the results of in-depth hemostatic studies in piglets. It was found that in piglets during the period of the milk supply phase, platelet hemostasis increases. the leading basis of this process should be considered the dynamics of activity of receptor and postreceptor processes in platelets. Their activation provides an intensification of adhesion, aggregation and secretion in these formed elements. It is clear that the activation of platelet properties in piglets during the milk supply phase creates the conditions for homeostasis in any environmental conditions by maintaining the optimum microcirculation in the organs, adequate to the needs of the actively growing organism.

Key words: *adhesion, aggregation, secretion, platelets, piglets, dairy nutrition phase.*

Introduction. During animal ontogenesis, the work of hemostasis largely ensures the preservation of the main parameters of homeostasis. Its normal functioning preserves the liquid state of the blood in the vessels, and, if necessary, it realizes local thrombus formation at the site of the alteration of their walls. The consistency of the functioning of the entire hemostasis ensures the optimum volume of blood in the vessels and the normal trophism of body tissues. This is due to the fact that hemostasis largely determines the rheological characteristics of blood at any age [2].

The optimal state of hemostasis maintains the physiological status of the internal organs in the development process. In this regard, it is very important to further study the mechanisms of hemostasis at different ages in different types of farm animals. Clarifying the species and age aspects can broaden knowledge of the bioregulatory properties of the hemostasis system and help in finding approaches to enhancing the expression of their economically useful traits. There is reason to believe that the optimization of hemostatic mechanisms under pathological conditions is largely capable of maintaining the productive parameters of the organism of farm animals at an economically advantageous level, regardless of environmental conditions [5].

Physiologically, platelets are an extremely important element in the hemostasis system. The level of their functional activity essentially determines the state of blood flow in the vessels of the microvasculature, and therefore, the state of metabolic processes in the tissue and organs. This is of particular importance during the dairy nutrition phase - during the preparation of the organism for consumption of feed of plant origin. It is clear that the degree of activity of platelets seriously depends on the int5nsivnost development of the whole organism of the animal,

the level of its vital parameters, including economically significant [3]. In this regard, further clarification of aspects of the physiological parameters of platelets in piglets of dairy nutrition is of great importance for the fundamental and practical physiology of pigs. The importance of these studies is due to the fact that pigs are one of the most important productive animals in many countries of the world [2]. For this reason, the goal has been set in work: to determine the peculiarities of platelet activity in piglets during the milk nutrition phase.

Research methods. The study was carried out in full compliance with the ethical standards set forth in the European Convention for the Protection of Vertebrates, used for experimental and other scientific purposes, which was adopted in Strasbourg on March 18, 1986 and which was confirmed in Strasbourg on June 15, 2006. The study protocol was approved by the local ethical committee of the Vologda State Academy of Dairy Farming. N.V. Vereshchagin (Minutes No. 12 of December 3, 2015).

The work was carried out on 35 piglets of the large white breed, having a normal functional status. All piglets taken under observation were obtained from completely healthy sows 2-3 by farrowing. All animals were examined 4 times: on the 6th day, on the 10th day, on the 15th day and on the 20th day of their life. Blood samples from the examined piglets were taken from the tail vein.

The intensity of aggregation was recorded using a visual micromethod using thrombin (0.125 units / ml), collagen (1: 2 dilution of the main suspension), adenosine diphosphate (ADP) (0.5 × 10-4 M), ristomycin (0.8 mg / ml) and adrenaline (5.0 × 10-6 M). Platelet aggregation was determined in plasma, which was previously standardized by the number of platelets to the level of 200x109 platelets in 1 liter [1].

In inactive platelets, piglets and their platelets, which were stimulated with a standard dose of collagen, determined the content and severity of self-assembly of actin and myosin molecules, as well as the amount of ADP and its secretion [1]. The digital results of the study were processed using student's criterion.

Research results. Normal blood platelet concentrations were found in the blood of the observed piglets. In the examined piglets during the milk supply phase, the dynamics of the recorded parameters were noted (Table 1).

Table 1 - *Indicators of blood platelets in piglets of dairy nutrition*

Platelet indicators	Age of animals, n=35, M±m			
	6 day of life	10 day of life	15 day of life	20 day of life
The time of development of platelet aggregation with collagen, s	32,3±0,07	30,6±0,06	29,7±0,09	28,8±0,05 p<0,05
The time of development of platelet aggregation with thrombin, s	54,3±0,06	53,2±0,08	52,4±0,11	50,3±0,10 p<0,05
The time of development of platelet aggregation with ristomycin, s	44,3±0,10	43,2±0,06	40,8±0,08	39,7±0,06 p<0,05
The development of platelet aggregation with adrenaline, s	97,5±0,15	96,0±0,14	94,4±0,10	92,0±0,12 p<0,05
The amount of actin in inactive platelets,% of the total protein content in the platelet	26,5±0,08	27,0±0,07	27,9±0,10	28,7±0,12
The amount of actin in platelets subjected to thrombin-aggregation,% of the total protein content in the platelet	60,5±0,06	61,2±0,14	61,9±0,17	62,6±0,12
The amount of myosin in inactive platelets,% of the total protein content in the platelet	11,4±0,09	11,6±0,11	12,1±0,08	12,8±0,07
The amount of myosin in platelets subjected to thrombin-aggregation,% of the total protein content in the platelet	71,4±0,10	71,9±0,08	72,6±0,09	73,8±0,12
The time of development of platelet aggregation with ADP, s	42,2±0,12	41,9±0,10	40,3±0,07	39,1±0,09 p<0,05
The number of ADP in intact platelets, mmol / 10^9 platelets	3,11±0,11	3,18±0,08	3,25±0,10	3,38±0,09 p<0,05
The severity of secretion of ADP from platelets in terms of their stimulation,%	35,0±0,10	36,8±0,09	38,5±0,07	40,6±0,11 p<0,05

Reference designations: p - the reliability of the dynamics taken into account relative to the beginning of the phase of the milk supply.

In piglets on the 6th day, the time of development of platelet aggregation with collagen reached 32.3 ± 0.07 s. By the end of the observation, it decreased to 28.8 ± 0.05 s (Table 1). A comparable acceleration of the development of platelet aggregation in piglets was found in relation to ADP - by 7.9% and in response to ristomycin by 11.6%. A little later, platelet aggregation occurred with thrombin (at the end of the observation 50.3 ± 0.10 s) and with adrenaline (at the end of the observation 92.0 ± 0.12 s).

The content of actin in inactive platelets of piglets at the age of 6 days was equal to 26.5 ± 0.08% of the total protein in the platelet. Subsequently, it experienced a tendency to increase to 28.7 ± 0.12% of the total protein in the platelet by the end of the observation (Table 1). The severity of actin generation during platelet aggregation in response to a strong inducer in piglets experienced a certain upward trend, remaining at a fairly low level.

In inactive platelets in piglets at the age of 6 days a low content of myosin was noted. On the 20th day, its level was 12.8 ± 0.07% of the total protein content in the platelet. At the same time, an increase in platelet aggregation took place in animals during the dairy nutrition phase.

In piglets during the milk supply phase, there was a slight increase in the amount of ADP in platelets (by 8.7%) and an increase in the intensity of its release (by 16.0%) under conditions of exposure to platelets of a strong aggregation inducer.

Discussion. The currently known information on the functioning of hemostasis in pigs of different ages cannot be considered complete [5]. There is still an urgent need to continue the study of this blood system in piglets in the initial stages of their ontogenesis. Modern physiologists attach great importance to the level of platelet activity in hemostasis [3]. This is due to the fact that their activity determines the state of the rheology of the blood, especially in the microvasculature and the level of metabolism in the tissues. At the same time, platelet activity and the underlying mechanisms that ensure it in piglets during early ontogenesis are still poorly studied.

In piglets during the milk supply phase, an increase in the adhesive capacity of the platelets was observed as a result of a simultaneous increase in the level of von Willebrand factor (FW) in their plasma, which acts as a cofactor of the platelet adhesion process and the number of receptors to it (GPI) on their membranes [2]. The growth of the activity of these adhesive mechanisms in piglets was judged by the early development of the aggregation of their platelets with ristominin. The basis for the formation of this conclusion was the ability of ristomycin to influence platelets as subendothelial vascular structures. It is recognized that during adhesion, FW is connected at one end with the collagen molecule of the vessel, and the other with the platelet, interacting with its glycoprotein Ib and forming a kind of adhesion bridge. It is represented by an emerging chain: collagen - FW - GPI. Given the acceleration of the aggregation of platelet piglets in response to ristominin, we can say that in the observed animals the number of receptors for it on the platelet surface increases.

The found acceleration of the platelet aggregation process with the other inductors also showed an increase in the number of receptors on the blood plates in piglets between 6 and 20 days of life, which increase the activity of platelets. Applying strong and weak inducers of platelet aggregation in piglets revealed an increase in the physiological mechanisms of activation of platelets going under normal blood flow conditions [1].

The revealed acceleration of the development of platelet aggregation in the observed animals was provided by the activation of not only receptor, but also intracellular processes of platelet activity [4].

Platelet secretion has a great hemostatic activity. In piglets taken into operation, its intensification was noted during the dairy feeding phase. This was confirmed by the increase in the accumulation of adenosine diphosphate platelet granules in the granules and the increase in its release from them under the influence of platelet stimulants that appeared in the medium [2]. The functional activity of platelet secretion in piglets is very significantly ensured by the dynamics of actin and myosin content in them and the degree of their additional formation on the background of platelet aggregation in response to the introduction of an inducer of the aggregation process into the plasma. The found changes in these parameters in the examined piglets largely determined the dynamics in their secretion of ADP.

Conclusion. During the milk feeding phase of the piglets, there is some increase in the activity of the platelet component of hemostasis. This seems to be based on the activation of the receptor and post-receptor stages of information transfer in platelets. These changes are manifested at the physiological level in the form of increased platelet adhesion, aggregation and secretion. The detected increase in platelet activity in milk-fed piglets undoubtedly creates conditions for maintaining their homeostasis and the necessary level of trophism in the organs.

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生长石英晶体中的压电效应
PIEZOELECTRIC EFFECT IN GROWN QUARTZ CRYSTALS

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Due to the piezoelectric property, crystalline quartz is widely used in modern technology to stabilize the frequency of electromagnetic oscillations, to generate ultrasonic waves, in multi-channel telephone communications, in electronic equipment, including space. For certain types of crystallographic symmetry, as a result of crystal deformation, a direct piezoelectric effect arises — electric charges proportional to the strain value appear on the crystal faces. The inverse piezoelectric effect also takes place, which consists in the fact that internal stresses occur in the electric field in the crystals, which are proportional to the field strength. The piezoelectric effect is closely related to the essence of the crystal structure. The crystals have a geometrically correct arrangement of the structural elements constituting them, the alternation of which in space forms a crystal lattice. Direct and inverse piezoelectric effects are used to stabilize the frequency: when a periodic change in the electric field applied to a crystal, such as quartz, resonant mechanical vibrations occur in the latter if the frequency of the field change is equal to one of the natural frequencies of the crystal. Due to the reverse piezoelectric effect, these mechanical oscillations cause very intense electrical oscillations if the frequency of the field change is equal to one of the natural frequencies of the crystal. Due to the reverse piezoelectric effect, these mechanical oscillations cause intensive electrical oscillations, which have a strong effect on the electrical circuit that excited them. The natural frequency of a piezoelectric crystal is determined by its physical properties and geometric dimensions. Piezoelectric quartz resonators are currently manufactured in a wide range and cover the frequency range from several hundred hertz to several hundred megahertz. Using radio tools used for multiplication and frequency conversion, quartz resonators can be used to stabilize electrical oscillations in an even wider range, up to centimeter waves.

Therefore, in this work, in order to expand the field of application of quartz crystals and control their radiation properties, data are presented on the growth of crystalline quartz with different structural characteristics. In particular, data are presented on the growth of the β-phase of crystalline quartz on seeds irradiated with neutrons. Earlier / 1 / method of IR spectroscopy and X-ray analysis showed that in neutron-irradiated crystals in the dose range 5 * 1018-5 * 1019 n/cm^2, the formation of β and metamict quartz phase occurs. These data gave rise to new studies of the structure and optical properties of crystals grown on neutron-irradiated seed with doses of 1018, 5 * 1018, 1019 and 5 * 1019 n/cm^2, both to clarify the mechanism of the α-β transition, and to study the possibilities of inheritance, available in the seed, of neutron-induced point defects of the structure of β- and metamict phases of quartz in the growing layer. Studies of the structure of these crystals by the method of x-ray analysis showed that inheritance of the β-phase is observed in the growing layer [2]. In this work, we studied the GL spectra and compared it with the data of [1–4]; it was shown that the radiation-induced point defects of the β- and metamict phases of quartz are inherited.

The dependence of the intensity of neutron-induced bands of photo-gamma-luminescence (PL and GL) at 460, 550 660 nm in ordinary crystals (type 1) and in quartz crystals grown on neutron-irradiated seeds (type 1, Fig. 1) on the neutrons fluence in the interval 1016-8 * 1020 n /cm^2.

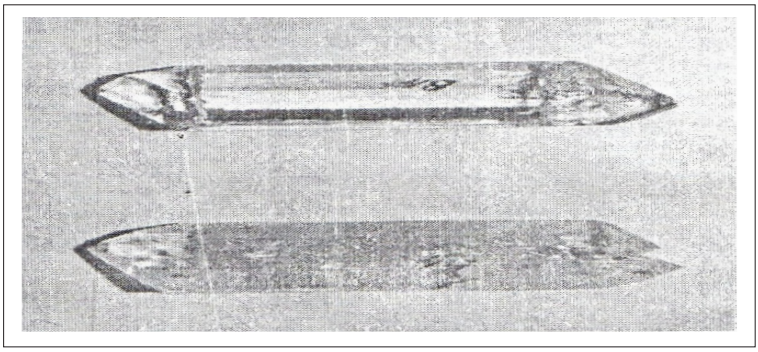

Fig.1. *Quartz crystals of type 11, the seed is unirradiated (1). The seed was irradiated with a neutron fluence of 1019 n /cm^2 (2).*

It is shown that in the HL the intensity of the bands 550 and 660 nm increases the doses of 1019 n /cm^2, and then decreases. In the case of PL, the intensity of the 660 nm band constantly increases with the neutron fluence (Fig. 2). In crystals irradiated with a dose of 2 * 1020 n /cm^2, the band of 550 nm disappears and the band of 460 nm appears.

Along with the known emission bands from the spectra of PL, GL, and TL (Thermoluminescence), a band with a maximum of 840 nm was detected. The intensity of the band at 840 nm increases with a fluence of up to 5 * 1019 n /cm^2, and then decreases and disappears at 1020 n /cm^2. Based on the results obtained, the nature of the centers responsible for the luminescence at 550, 660, and 840 nm, the mechanism and kinetics of phase transformations occurring in crystals under neutron irradiation are discussed.

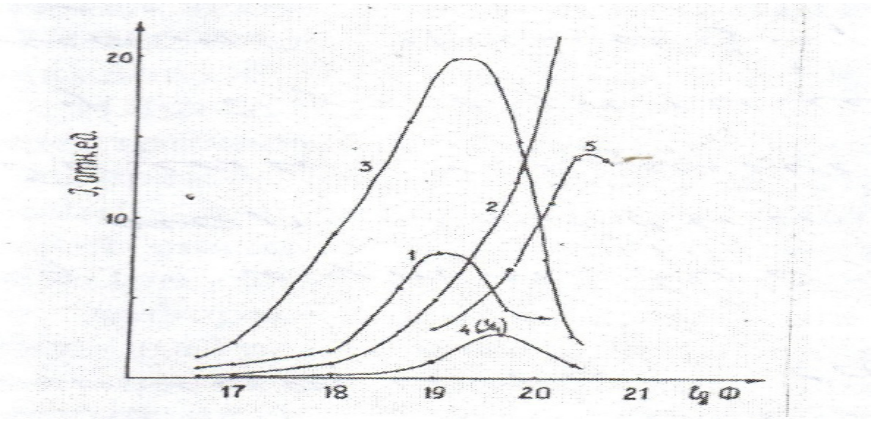

Fig. 2. *Dependence of the intensities of the PL bands 550 (1), 660 (2). 840 (4) and GL 660 (3), 460 nm (5) from neutron fluence*

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基于灰渣和炉渣废料的复合材料。 与传统材料比较
COMPOSITE MATERIAL BASED ON ASH AND SLAG WASTES. COMPARISON WITH TRADITIONAL MATERIALS

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抽象。该研究项目致力于描述根据喀山CHP-2中的灰渣和废渣制成的新型隔热材料。该论文描述了该材料的取样，其物理和机械性能以及其在建筑中的制造和使用的经济可行性。该复合材料代表含有灰分和炉渣废物的水泥材料，其具有和不具有表面涂层（通过浸渍在硫熔体中获得）。该研究表明，喀山CHP-2的灰渣和炉渣废料和硫磺浸渍材料在主要指标方面具有令人满意的参数，即：1）节能，因为它具有低导热系数并可用作隔热材料； 2）强度，它作为结构材料，在强度指标方面具有令人满意的参数； 3）在建筑中使用经济合理。

因此，这意味着这种材料最佳地结合了绝热材料和支撑壁材料的特性。根据喀山气候条件的计算，由这种复合材料制成的2.5块砖墙将提供承载能力和必要的传热阻力，而且这种建筑的成本平均要便宜2倍。比传统材料。此外，使用这种材料的主要论据之一将是生态方面。如果来自各种工业，特别是发电厂的灰渣和炉渣获得有前景的二次使用方式，则可以解决利用这种废物的许多环境问题。

关键词：保温材料，灰渣废渣，复合材料，节能

Abstract. *This research project is dedicated to a description of a new thermal insulating material made on the basis of ash and slag wastes taken from CHP-2 in Kazan. The paper describes the sampling of this material, its physical and mechanical properties and the economic feasibility of its manufacture and use in construction. This composite material represents a cement material that contains ash and slag wastes with and without a surface coating (obtained by an impregnation in the sulfur melt). The study has shown that the material made of ash and slag wastes from CHP-2 in Kazan and impregnated with sulfur has satisfactory parameters in terms of the main indicators, namely: 1) energy-savings, as it has a low coefficient of thermal conductivity and can be used as a thermal insulating material; 2) strength, it acts as a structural material and has satisfactory parameters in terms of strength indicators; 3) economically reasonable for use in construction.*

So it means that this material optimally combines the characteristics of both thermal insulating material and the supporting wall material. As calculations in the climatic conditions of Kazan have shown, the wall of 2.5 bricks made of this composite material will provide both the bearing capacity and the necessary heat transmission resistance, and furthermore, the cost of this construction will be on average in 2 times cheaper than that of traditional materials. Also, one of the main arguments for using this material will be the ecological aspect. If the ash and slag from various industries, in particular power plants, receive a promising way of secondary use, then many environmental problems with the utilization of this waste could be solved.

Keywords: *Thermal insulating material, ash and slag wastes, composite material, energy-savings*

Introduction. This research project is dedicated to a description of a new thermal insulating material made on the basis of ash and slag wastes taken from CHP-2 in Kazan. The paper describes the sampling of this material, its physical and mechanical properties and the economic feasibility of its manufacture and use in construction [1].

Main part. This composite material represents a cement material that contains ash and slag wastes with and without a surface coating (obtained by an impregnation in the sulfur melt) [2, 3].

The initial materials were:

1. Cement of a strength class 42,5H (GOST 31108-2003)
2. Sulfur - wastes from Nizhnekamsk oil refinery (GOST 127-03).
3. Masonry sand (GOST 8736-93)
4. Ash dump – wastes from Kazan CHP-2 that consists of:

Table 1. *Composition of ash and slag waste*

Nomination	Mass %
SiO2	47,7-52,2
CaO+MgO	4,3
R2O	1,84-19,03
Al2O3+TiO2	21,24-25,28
Fe2O3	5,2-5,9
SO3	0,2

Ash and slag wastes were divided into ash and slag components by using the sieving method. This project describes the usage of an ash component with a particle size of less than 1 mm.

Composition samples were prepared by mixing the initial components - cement, sand and ash and slag wastes. In terms of the optimal mechanical strength characteristics of the material the balance should be in cement to filler (sand and ash) ratio of 1:3. Therefore, we preferred to use this exactly components' ratio in the work. The resulting mixtures were sent to form the samples with casting into 2 × 2 × 6 cm molds. After form removal (within 28 days), the products were being dried at 100 ° C for 2 hours in a drying box [4].

The incorporation of ash and slag wastes into the cement concrete makes it possible to improve the thermal insulating properties of the concrete [5]. With an increase in the ash and slag wastes composition, thermal conductivity of the samples decreases from 0.311 W / m * ° C to 0.24 W / m * ° C, which can be explained by the vesicular structure formation.

An increase of ash and slag wastes proportion in the filler leads to a 2.5 times strength reduction. The samples filled only with ash and slag waste have an extremely low strength, and they shiver even with a little effort. This may happen due to the loose and vesicular structure formation of the samples and the absence of an adhesion between the binder and the fill material. The composite density also decreases, which can be explained by the low specific gravity of the ash and slag filler and the presence of a large number of pores and voids in the material. The existence of open pores in the samples filled with ash and slag waste caused high water absorption. So, the figure for the composition of cement to ash ratio was 45%, which is not acceptable for construction needs.

In order to produce beams with a protective coating, the samples were loaded into a container with molten sulfur at a temperature of 120-130 ° C and impregnated with sulfur for 1 hour. After that, products were removed from the impregnation chamber and cooled to the degree of an ambient temperature. The cooling process was accompanied by the crystallization of the melt in the pore space which led to the changes in the material properties [6].

After inoculation of the samples in the sulfur melt, their strength has significantly enhanced and their compression capacity increased almost in 8 times. The material based on the tailored composition of ash an slag wastes had a compression capacity of 4.2 MPa, and the material impregnated with sulfur had 35.7 MPa. They also became denser as their density has increased from 1.44 g / cm3 to 2.178 g / cm3, so as water resistance (water absorption dropped to 13%). The thermal conductivity of the samples has also slightly decreased from 0.15 W / m * ° C to 0.128 W / m * ° C.

Areas of use: these materials can be used both in dry rooms such as, for example, a thermal insulating layer in partitions, and also as a thermal covering in external walls [7]. Physical and mechanical characteristics of thermal insulating materials are presented in the summary table 2.

Table 2

The comparison of physical and mechanical properties of the thermal insulating materials

Materials	Sample composition, ratio	Density, g/cm^3	Strength, MPa	Water absorption, %	Thermal conductivity, W/m·^{0}C
Thermal insulating material based on ash and slag wastes of optimal constitution	Cement:Sand: Ash and slag wastes =1:1:2	1,44	4,2	17	0,15
Thermal insulating material based on ash and slag wastes impregnated with sulfur	Cement:Sand: Ash and slag wastes=1:1:2, impregnated with molten sulfur	2,178	35,7	2,8	0,128
Slag wool: a) fiber glass b) cinder wool c) stone wool d) basalt wool	90 % rock, 10% compounding material	0,035-0,2	0,08	1-2 %	0,030-0,052 0,46-0,48 0,048-0,077 0,035-0,042
Foam polystyrene	2 % vinyl benzene polymer (particle), 98% air	0,045	0,24	0,4 %	0,028-0,034
Foam cellular plastic	2 % styrene, 98 % gas	0,012-0,035	0,08	1 %	0,033-0,041

Thus, by analyzing the characteristics of a composite material based on ASW(ash and slag wastes) without impregnation and impregnated with sulfur, and by comparing them with the conventional thermal insulating materials, it can be concluded that the observed material comes short of the traditional insulating materials in terms of thermal conduction performance, but, at the same time, the composite material based on ASW and impregnated with sulfur approaches to the traditional red brick of the M300 brand with a compressive strength of 30 MPa in terms of its strength index of 35.7 MPa. Therefore, we can draw a conclusion that the composite material based on ASW impregnated with sulfur should be considered as a bearing wall material with high thermal insulating characteristics.

An economic feasibility of production of the composite material based on ash and slag wastes. A comparison with traditional materials

In order to produce the composite material based on ASW we need: cement, sand, ash and slag wastes, water.

Cement: CEM I 42,5N - portland cement with additives, compression capacity class on the 28th day is 42.5 MPa, subclass of compression capacity for 2 (7) days is normal-ardening, govering document GOST 31108-2003, compression capacity at the age of 2 days is no less than 10 MPa, compression capacity at the age of 7 days is non-standardized, compression capacity at the age of 28 days and more is 62.5 MPa, the initial set occurs at the earliest in 60 minutes.

The average market price is 280 rubles for 1 package (50 kg).

Sand: Masonry sand is a fill material of an inorganic nature with a size of about a grain that doesn't exceed 5 mm. The masonry sands' base consists of rock particles that were formed during their natural destruction under the influence of time and external environment. They can contain clay and organic substances in the type of small inclusions. Governing document: GOST 8736-93.

The average market price is 100 rubles / m^3

ASW: waste from Kazan CHP-2

The average market price is - free of charge

To produce 1 m^3 of composite material which consists of a cement to sand to ASW ratio that equals to 1: 1: 2 it is necessary to have:

1) Cement

$V = 0{,}25\ m^3$

Average density $\rho = 1100$ kg / m^3

$m = 1100 * 0.25 = 275$ kg

The cement cost for 50 kg reaches 300 rubles, so that the cost for 275 kg will equal 1540 rubles.

2) Sand

$V = 0.25\ m^3$

The sand cost for 1m^3 reaches 100 rubles, so that the cost for 0.25 m^2 will equal 25 rubles.

3) Ash and slag wastes

$V = 0.5\ m^3$

The total cost of the composite material based on the ASW will be 1540 + 25 = 1565 rub / m^3

Task: Conduct a thermal and economic calculation of a separation wall in the climatic conditions of the Kazan city made of:

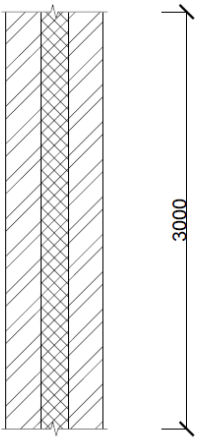
1) a composite material based on ash and slag wastes impregnated with sulfur;

2) a red clay brick with a slag wool insulant;

3) a red clay brick with a foam polystyrene insulant;

4) a red clay brick with a foam cellular plastic insulant.

Geometrical data of the separation wall:



width: a=3м.
height: h=3м.
thickness: 2 bricks (510mm) and an insulant by calculation.

Thermal and physical characteristics of the materials are taken from Table 1.

Average market prices for the materials are shown in Table 3.

Table 3

Nomination	Average market price, rubles/m3
Slag wool	1400
Foam polystyrene	1500
Foam cellular plastic	1500
Composite material based on ash and slag wastes	1565
Red brick	10 rubles/pcs
Cement-sand grout	1670

Climatic characteristics of the Kazan district's cold season that are necessary for calculation were taken according to Table 3.1 SP131.13330.2012 «Building climatology»:

The atmospheric temperature of the coldest five-day supplied by 0,92	- 31°C
The average atmospheric temperature of the period with an average daily atmospheric temperature <8°C	4,8°C
The duration of the period with an average daily atmospheric temperature <8 ° C	208 days

Calculation procedure

The main heat-shield performance of an enclosure is the quantity R_0^{pr} ($m^2 \cdot °C$) / W, which is called the reduced total thermal resistance and must not be less than the normalized value, so that to satisfy the condition $R_0^{pr} > R_0^{norm}$. In order to enhance this characteristic and ensure that the condition is fulfilled, we introduce a thermal insulation layer into the enclosure.

1) The normalized value of the enclosure structure's reduced total thermal resistance R_o^{norm}, (m² · ° C) / W should be determined by the formula:

$$R_o^{norm} = R_o^{tr} m_p ,$$

where R_o^{tr} – is the main quantity of the required enclosure structure's reduced total thermal resistance, (m² · ° C) / W, and should be used depending on the heating degree-day, HSDD, ° C · day / year, and the construction region.

m_p – is a coefficient that takes into account the peculiarities of the construction region. In this calculation it is assumed to be 1.

Heating degree-days, °C·day/year should be determined by the formula:

$$HSDD = (t_b - t_{heat}) \cdot z_{heat}$$

Where t_{heat}, z_{heat} – is an average ambient air temperature , °C, and duration of the heating period, day / year, that are taken according to SP 131.13330.2012 "Building climatology" for the period with an average daily ambient air temperature of no more than 8 ° C.

t_b – is the design indoor air temperature °C, that is taken for calculating the enclosure structures in residence and communal buildings according to the minimum quantities of the comfort temperature for those buildings in accordance with GOST 26253-2014 «Buildings and constructions. A method to determine the heat resistance of enclosure structures».

We take:

T_b=20°C ;

t_{heat} = -4,8°C ;

z_{heat}=208 day/year.

$$HSDD = (t_b - t_{heat}) \cdot z_{heat} = (20+4,8)*208 = 5158,4 \ (°C \cdot day/year)$$

Values R_o^{tr} for the HSDD quantities should be determined by:

$$R_o^{tr} = a \cdot HSDD + b, \text{ where } a=0,00035 ; b=1,4$$

Then: $R_o^{tr} = 0,00035*5158,4+1,4=3,2 \ W/(m^2 \cdot °C)$

In the conditions of Kazan city the value of the heat transmission resistance of the separation wall must be no less than 3,2 W/(m² ·°C).

All the calculations are consolidated in the final Table 4.

Table 4. *Cost of materials*

№	Materials of a separation wall	Thickness, mm	Heat transmission resistance, m^2*°C/W	Cost, rubles
1	Composite material based on ASW impregnated with sulfur	640	4,12	9105,12
2	Red clay brick with a slag wool insulant	690	3,72	23015,25
3	Red clay brick with a foam polystyrene insulant	610	3,5	22097,25
4	Red clay brick with a foam cellular plastic insulant	610	3,5	22097,25

Thus, the study has shown that the material made of ash and slag wastes from CHP-2 in Kazan and impregnated with sulfur has satisfactory parameters in terms of the main indicators, namely:

- energy-savings, as it has a low coefficient of thermal conductivity and can be used as a thermal insulating material;
- strength, it acts as a structural material and has satisfactory parameters in terms of strength indicators;
- economically reasonable for use in construction.

So it means that this material optimally combines the characteristics of both thermal insulating material and the supporting wall material. As calculations in the climatic conditions of Kazan have shown, the wall of 2.5 bricks made of this composite material will provide both the bearing capacity and the necessary heat transmission resistance, and furthermore, the cost of this construction will be on average in 2 times cheaper than that of traditional materials.

Also, one of the main arguments for using this material will be the ecological aspect. If the ash and slag from various industries, in particular power plants, receive a promising way of secondary use, then many environmental problems with the utilization of this waste could be solved.

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UDC 004.41:628

非侵入式血糖仪技术支持，用于去除和分析生物活性区的生物物理指标
TECHNICAL SUPPORT OF NON-INVASIVE GLUCOMETER FOR THE REMOVAL AND ANALYSIS OF BIOPHYSICAL INDICATORS OF BIOLOGICALLY ACTIVE ZONES

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注解。 本文讨论了创建非侵入式计算机生物仪表装置的各个方面以及随后对生物活性区域的生物物理指标的分析，提出了为处理实验数据的自动化系统开发适当的数学模型和软件。

关键词：计算机生物计量表，非侵入性方法，生物活性点，干扰抑制，适当的模型。

Annotation. *The paper discusses aspects of creating a non-invasive computer bio-meter apparatus and the subsequent analysis of biophysical indicators of biologically active zones, proposes the development of adequate mathematical models and software for an automated system for processing experimental data.*

Keywords: *computer bio-meter, non-invasive method, biologically active points, interference suppression, adequate model.*

As you know, it is no secret that positive changes in all spheres of society are associated with the level of direct application and implementation of information and communication technologies (ICT) in practical activities. Scientific research aimed at solving problems and tasks arising in the integration process (ICT) with the area of research under consideration is associated with the use of system analysis tools, data processing and management. In many cases, the integration process is manifested in the implementation of methods and means of automated system management. This is especially in demand in the field of medicine, where opera-

tional processing of the results of experiments and the adoption of a scientific - informed decision is required. And this is achieved using the above tools. In this connection, the task of developing a software shell for the effective functioning of a non-invasive glucometer apparatus becomes relevant. Here it is necessary to emphasize that the apparatus of non-invasive bio-meters will also be improved [3, .., 15]. For this purpose, the current state of the development of non-invasive bio-measuring devices has been analyzed and the problems of creating computer bio-measuring devices have been revealed [7, 8, 9, 14, 15].

Problems of creating a computer bio-meter. The basis of functional diagnostics devices based on computer technology should be a computer bioelectric meter built on a modern elemental base - multichannel low-noise operational amplifiers, multi-bit and multichannel integrated analog-to-digital converters (ADC), programmable logic matrices and / or microcontrollers [1,2,3] .

The basis of this digital bio-meter is an ADC - the main characteristics of the entire system largely depend on its parameters. One of the advanced methods is the use of a multi-bit ADC (22-24 bit) as an ADC, which allows you to measure a biosignal directly from electrodes located on a bioobject. This implementation of the bio-meter has the following advantages:

- no need for multi-channel low-noise amplifiers
- downsizing of the system
- the possibility of applying the technology of saving the signal "as is"

The “as is” signal preservation technology allows you to save a biosignal as removed from the electrodes located on the bio-object without post-processing. This technology allows you to change the parameters of the system after measuring, for example, the sensitivity or frequency range of the measured signal.

The microcontroller used to register biosignals must have the ability to process digital signals (DSP), high speed, large memory and rich peripherals. This criterion is well met by 32-bit STM32 processors with the Cortex M4 (3) core of ST Micro electronics (Fig. 8). In this implementation, in addition to a rich communication interface (USB, SPI, etc.), there is a real-time clock timer, an interface for the LCD module, an interface for the touch screen (touch panel), and an automatic direct memory access device (DMA) and the priority system of singing (Interrupt).

The number of channels of the bio-meter can vary from 4-8 (ECG, EMG and Holter ECG) to 32 (EEG), depending on the type of bio-meter.

Based on the above considerations, we propose the following structure of a modern multi-channel bio-meter (Fig. 1.) consisting of several (3 pieces) of a fully-equipped (Front-End) ADC and ARM Cortex microprocessor. Of course with the possibility of autonomous (battery power), LCD touch screen, micro CD memory and also having a wireless connection.

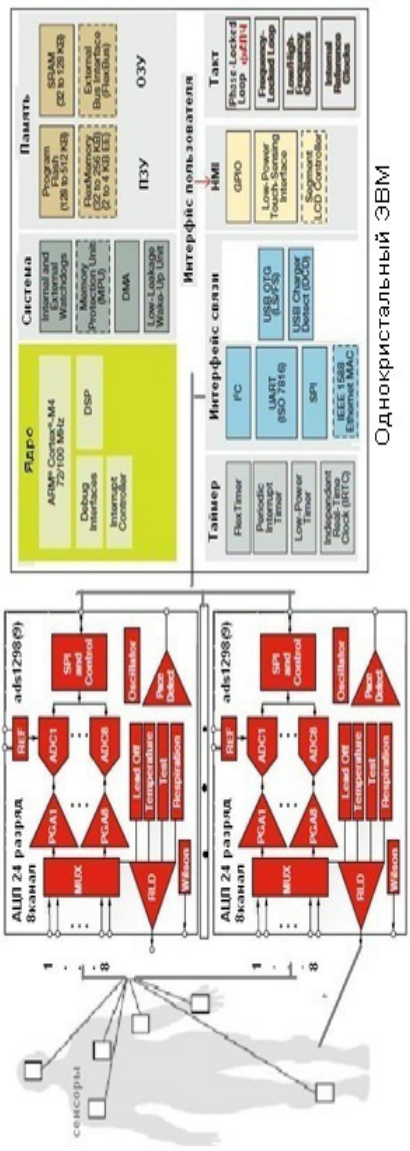


Figure 1. *The structure of a modern bio-meter based on a multi-channel 24-bit ADC and a single-chip STM32 CortexM4 computer.*

The ADS1299 ADC (8) is connected to the microprocessor via the SPI serial port, in cascade mode, in the Daisy-Chain mode [1,2]. At the same time, 216 bits = 24 status bits + 24 bits * 8 channels = 3 bytes + 3 bytes * 8 channels = 27 bytes for each ADC are read in the DMA device by direct memory access. The code of this algorithm in C ++ is given below:

```
voidEXTI9_5_IRQHandler(void)
{
if(!HAL_GPIO_ReadPin(SPI1_Port, ADC_Ready))
    {
    HAL_GPIO_WritePin(SPI1_Port, SPI1_CS, GPIO_PIN_RESET);
    HAL_GPIO_EXTI_IRQHandler(ADC_Ready);
    DMA2_Stream0->NDTR = (uint32_t) 28;// counter data 9*3+1
    SPI1->CR1 |=(uint16_t) 0x0040;//SPI_CR1 register SPE bit set 1: SPI1 Peripheral enabled
    DMA2_Stream0->CR   =0x06030411;//011: channel 3 selected + MINC: Memory increment mode + 11: Very high Priority
};
}
```

This EXTI9_5_IRQ Handler subroutine interrupt service is called by the readiness signal (**Data Ready (! DRDY)**) of the ADC and allows using the DMA2 root channel to write 27 + 1 bytes of data through SPI1 to the memory received from the ADC.

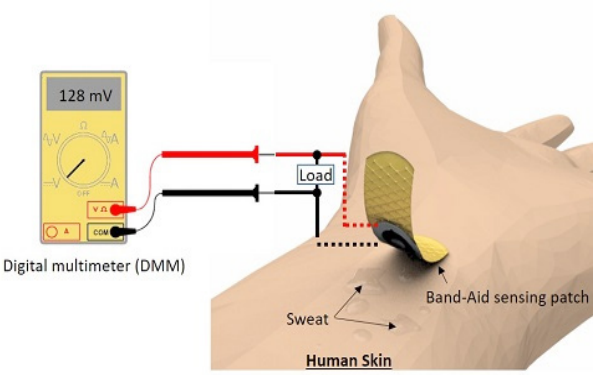
After receiving all 27 bytes, the DMA device generates a preference signal to proceed to the maintenance of the DMA2_Stream0_IRQ Handler routine:

```
void DMA2_Stream0_IRQHandler(void)
{
    uint8_t  i;
    HAL_GPIO_Write Pin(SPI1_Port, SPI1_CS, GPIO_PIN_SET);
    SPI1->CR1 &=(uint16_t) 0xFFBF;//SPI_CR1 register SPE bit clear 0: SPI1 Peripheral disabled

HAL_DMA_IRQHandler(&hdma_spi1_rx);
if((rxBuf[1]&0xC0)==0xC0)
    {
    for(i=0;i<8;i++)
    {
    ECG8_25[i+ECG_Cntr*8]=SIGN_EXT_24(rxBuf[3*i+4]<<16)+(rxBuf[3*i+5] <<8) +(rxBuf[3*i+6]) ;
    }
```

```
    ECG_Cntr++;
    if(ECG_Cntr>24)
{ECG_Cntr=0;
ReadyDataECG=ENABLE;
        }
    }
}
```

This subroutine creates a stream of 25 samples of 32 bit biosignal values over the entire 24 channels.



a)

b)

Figure 2. *Non-invasive blood sugar monitor*

Figure-2 shows: a) a bio-meter for the removal of electrical impulse characteristics of bi-active zones based on the ADC; b) an advanced non-invasive blood glucose meter that includes the removal of the electropulse characteristics of the BAT, the built-in conversion models, the processing of removable data, the formation of diagnostic parameters, as well as the programmed materialized knowledge recorded by the industrial method.

The results of research on the development of adequate mathematical models and software and software for improving the functions of processing removable experimental data and diagnostics, automated non-invasive blood glucose meter, will be announced in subsequent publications.

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基于创新方法的自动化非侵入式血糖仪系统
AUTOMATED NON-INVASIVE GLUCOMETER SYSTEM BASED ON INNOVATIVE APPROACHES

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注解。 本文提出了基于创新方法改进无创血糖仪的方法。 通过分解该问题，获得用于求解的特定任务，其用于数学，统计，算法和计算机模拟方法。

关键词：创新型无创血糖仪，生物活性点电阻，数理统计，建模，多准则评估，模式识别。

Annotation*. The paper proposes methods for improving non-invasive blood glucose meter based on an innovative approach. By decomposing this problem, specific tasks are obtained for solving which are used in mathematical, statistical, algorithmic, and computer simulation methods.*

Keywords: *innovative non-invasive blood glucose meter, electrical resistance of bioactive points, mathematical statistics, modeling, multi-criteria evaluation, pattern recognition.*

The urgency of the indicated problem is dictated by the need to develop an automated shell for processing data obtained from an improved apparatus of an innovative non-invasive glucometer, which contains new materialized knowledge. Along with this, the achievement of efficiency (in the Online mode) in processing the results of measuring blood composition in a non-invasive way is one of the urgent and priority tasks, and the development of an algorithmic and software shell for autonomous processing of data obtained from a computer bio-meter, operational processing.

The scientific significance of this work lies in the fact that the introduction of a complex of software and hardware into practice allows non-invasive, promptly, in real time, to determine the amount of glucose in the blood, analyze, diagnose and prescribe medical procedures. And this significantly reduces the likelihood of infectious diseases acquired in an invasive way.

As a result of introducing into practice an innovative non-invasive glucometer and its automated envelope, we obtain a tool for diagnosing and forming therapeutic and prophylactic procedures for a patient with diabetes mellitus (DM).

Non-invasive methods, in essence, and content determine the social significance of this approach, since they do not involve the analysis of the patient's blood composition. Here, the focus is on building an adequate model of reflective laboratory results. If we bear in mind that the number of people suffering from diabetes across the world is increasing intensively every year, then the alternative research results in this area will correspond to the world level of research [9].

The scientific novelty of the research is as follows:

• based on the analysis of existing domestic and foreign sources, the development of a new and improved innovative non-invasive approach and a method for determining the amount of glucose in a patient's blood during diabetes. research and the establishment of a link between electrical skin resistivity (ESC) in bioactive points (BAT) and changes in the amount of glucose in a patient's blood;

• materialized knowledge; development of mathematical and statistical models for processing experimental data;

• development of an information shell for the automated operation of an innovative non-invasive blood glucose meter;

• conducting field experiments to assess the adequacy of this model and the system as a whole.

As a result of decomposition of this problem, we obtain the following tasks:

1. Static processing of baseline clinical data [10].

2. Definitions of correlation between outgoing and exiting parameters.

3. The choice of local criteria and the solution of the problem of forming a set of informative parameters.

4. When ranking informative features the use of multi-criteria dispersion method.

5. Construction of mathematical, algorithmic models and the formation of a software complex.

6. Constructing a multi-criteria algorithm for assessing the adequacy of the model. Development of the algorithm of the "spline" method of approximation of experimental data and their inclusion in the model [7].

7. Development of information shell structure for automated functioning of innovative non-invasive blood glucose meter.

The work contributes to the formation of scientific and technological groundwork for the successful integration of advanced achievements of information and communication technologies (ICT) in medicine and can serve as a basis for the improvement of innovative non-invasive techniques.

The project's contribution to economic growth and social development of society is manifested in the restoration of public health and in the desire to extend the working life of human resources.

The scientific novelty of the research is as follows:

- development of the concept of creating a non-invasive glucometer based on the application of innovative ideas and methods [10];

- creation of an improved computer bio-meter for measuring ESCs in BAT [8];

- on the basis of observations of the numerical values of ESCs in reprentative BAT located in the patient's body meridians, determining the degree of deviation from the norm of the corridor and diagnose the pathological stages of the disease [5], as well as developing algorithmic and software for its practical implementation:

- using the tools of mathematical modeling and statistical processing of experimental results, establishing the relationship between the ratios of the amount of glucose in the blood and ESC in the BAT;

- on the basis of selected local criteria, determining the degree of information content of the BAT.

In order to improve the adequacy of the model, it is proposed to use the multicriteria dispersion estimation method [2], where the data obtained according to local criteria serve as the initial data. The use of the proposed methodology in practice, especially medicine, encourages motivation among researchers and specialists in the field of integrating advanced ICT achievements with medicine and is the basis for improving developments in this field. If there is a need for centralized management and integration of the latest scientific and practical achievements in this area into global systems: “The intelligent decision support system”, “Information and measuring systems”, etc., then this work can be used as a module because software component [4,5,6] is satisfied mobility requirements.

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中子照射的β相石英中晶格缺陷的顺磁共振
PARAMAGNETIC RESONANSE OF LATTICE DEFECTS IN NEUTRON-IRRADIATED B-PHASE QUARTZ

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Abstract. *The structures and radiation-optical characteristics of quartz crystals expressed on neutron-irradiated primers using the EPR spectroscopy method were studied.*

Now influence of structural of not the same layer crystals as β-, metamictic phases, and also of dot defects and impurity on kinetics of phase transformations occurring in crystals of quartz at a neutron irradiation are not investigated. The task is aggravated also by that as is known [1] the β- phase of quartz in usual conditions stably does not exist separately and the defects of its structure are not investigated.

Therefore in the given work the opportunities inheritance induced radiation-induced β - phases and dot defects of the seeds by the accrued layer of the brought up crystal of quartz and law of their distribution on thickness of a crystal by a method of electronic paramagnetic resonance (EPR). As now among spectral methods at studying of a nature of the defective centers, establishment of defects' belonging to this or that phase of crystals, most informative is the method EPR.

Research of spectra of EPR crystals of the quartz which has been brought up on neutron irradiated seeds carried out on spectrometer EPR ER- 420 with length of a wave λ=3 sm. Samples previously were irradiated ɣ- ray by a doze 10^5 degree.

In [2] method EPR is shown, that in natural and artificial crystals of quartz, burned off at temperature T-970 K, after ɣ- irradiation by a doze D= 10^6 degree and heated at T=570 K, exists new paramagnetic T-centre.

According to classification of the paramagnetic centers for various spatial groups of crystals 3 is established, that T- centers can exist in- phase having spatial group $P6_2$.22 In opinion of the authors more preferable, that in structure of β–quartz T-centers is formed in silicon-oxygen tetrayder with vacancies of silicon.

Preceding from this it's possible to suppose, that in crystals of the quartz which has been brought up on neutron irradiated seeds should be T-centers.

Our experimental results show, that in all crystals which have been brought up on neutron irradiated seeds, the T-centers are observed. With growth of neutrons fluency the signal strength of T- centers is increased. The comparative researches have shown, that in all cases the signal strength of T- centre is much more in dark–smoky crystals, than in transparent. The comparison shows, that the increase of concentration of T-centers with fluency growth of seeds irradiation of crystals is qualitatively well coordinating to the data of the x-ray structure analysis [4] and results of luminescent researches [5].

Thus it's necessary to note, that to direct quantitative correlation between quantity of β - phase and concentration of T- the centers should not exist, as T-centre are formed in structure of β-phase of the quartz.

lt is known, that in crystals of quartz the smoky coloring is caused $[AlO_4]$ -centre appearing for the account of isomorphic replacement of ions Si^{4+} by an impurity Al^{3+} [6]. In [7.8] is shown, that the entry Al^{3+} promotes creation E- centers in crystals SiO_2 under action of ionized radiations. Then according to model of T- centre 2 (and data [6, 8] it's possible to assume, that different concentrations of $[AlO_4]$ and E-centers results to observable quantitative distinction of T-centers in dark and transparent samples. The research of spectra EPR has shown, that is valid in dark samples the intensity of signals from $[AlO_4]$ -and E'- centers more than in transparent crystals.

For study of laws of T-centers formation the spectra EPR of the usual neutrons irradiated crystals of quartz and crystals which have been brought up on neutron irradiated seeds, after an additional neutron irradiation are investigated. In spectra EPR of the usual crystals, irradiated with neutrons, in spite of the fact that in them the β phases exist, the T-centers are not found out. The additional irradiation of crystals of the quartz which has been brought up on neutron irradiated seeds, results to reduction of quantity of the T-centers. At fluencies of an additional irradiation $10^{18}\,n.sm^{-2}$ spectrum EPR from T-centre is not found out.

In [2] is shown, that in natural crystals of quartz T -centre are formed in those sites of a crystal, which grew at temperatures close to temperature of transition. Most of low temperatured crystals do not contain T-centers. We for studying laws of distribution of T-centers on crystal thickness were investigated spectra EPR plates which have been cut out from an accrued layer in parallel seeds by thickness 2 mm. It is revealed, that up to the certain thickness, the concentration of T-centers is increased, and then falls Research of structure of crystals of the quartz which has been brought up on neutron irradiated seeds by a method, irradiated with neutrons, described in [9,11], has shown, that quantity of β-phase decreases with growth of thickness of the accrued layer.

For example, in crystals brought up on fluency irradiated neutrons 5.10^{19}, n. sm^{-2} seeds, quantity of - the β - phases in the first plate, thickness of 2-4 mm, which has been cut out from an accrued layer in parallel seed, are made by 48% from total amount of a crystal. In the third plate, i.e. in the accrued layer removed from seed on 6-8 mm of quantity of β-phase- 13% and in the fifth plate (10-13 mm) – the β - phase is not found out.

Let's note that crystals of quartz on neutron irradiated seeds were grown up in usual P-T-conditions of growth for quartz. As in this case in the seed α and β –phases available, distinguished from each other in physic-chemical and structural parameters [6], it is necessary to expect, that the variation of phase structure of the seed will result to change of P-T-conditions of growth as a whole for a crystal. Therefore it is possible to assume, that the reduction of concentration of T- centers is caused by change of P-T of growth conditions with increase of quantity of β - phase.

On the basis of the above-stated data we consider, that in crystals of the quartz which have been brought up on neutron irradiated seeds, inherited with the accrued layer by the induced radiation phase is defective and display of paramagnetic T-centre is provided at the expense of change of P - T conditions of growth.

Thus, the received data show the opportunity of synthesis of stable in normal conditions of β - phase of quartz on irradiated seeds, i.e. opportunity of reception by hydrothermal method of crystals with the given structural characteristics.

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多功能计算机化电脉冲扫描，移除和随后分析生物活性区域的生物物理指标
MULTIFUNCTIONAL COMPUTERIZED ELECTROPULSE SCANNING, REMOVAL AND SUBSEQUENT ANALYSIS OF BIOPHYSICAL INDICATORS OF BIOLOGICALLY ACTIVE ZONES

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Even in antiquity, physicians knew that by acting on a person's bioactive points by acupuncture or cauterization, it is possible to influence internal organs. Multifunctional computerized electropulse scanning (CES) -method instrumental functional diagnostics method, based on the removal and subsequent analysis of biophysical indicators of biologically active zones. Today MKES - diagnostics is the most used not only by specialists in electro-puncture therapy, but also by general therapeutic doctors. The new neurofunctional diagnostic method MKES is based on the well-known electro-puncture diagnostics (EPD), the widespread introduction of which into practical healthcare began in the 90s of the 20th century, when numerous studies confirmed that the most accessible criterion for evaluating vegetative reactions at the segmental level is the study of the physical properties of the skin in particular its electrical resistance. A number of authors (Benonson, ME, 1963; Portnov, F.G., 1980; Nechushkin, A.I., Gaidomakina, AM, 1981) note that dermal electric conductivity characterizes the state of the sympathetic section of the autonomic nervous system (ANS).). Thus, Tauer and Richter (quoted in FG Portnou, 1980) showed the dependence of the electrical resistance of the skin on the state of sympathetic innervation of the corresponding dermatomes. They found that with the sympathetic nerve fiber degeneration, the resistance of the corresponding skin to a constant electric current increases tenfold, and as the restoration of the sympathetic connections decreases, it returns to normal.

From the standpoint of modern neurophysiology, the integuments, tendon-muscular apparatus and internal organs are closely linked through the nervous system, which has a segmental structure. Thus, each internal organ (splanhnotom) is associated with a certain segment of the nervous system (neurotome), which in turn innervates the muscular group (myotome), tendon-ligament apparatus

(sclerotome), vessels (vasotum), bone structures (osteotome) and, finally, a section of the skin surface (dermatitis). Such connections form in the body a morphofunctional system (MFS) (see Fig. 1.) whose integrity and all other systems ensure the process of neurons in the nerve trunks and pathways. The formation of morphofunctional systems of the body (MFS) begins in embryogenesis, when records of specific internal organs, skin areas, muscles and tendons are interconnected by a common initial innervation, which is preserved when organs and tissues are displaced due to the simultaneous growth of nerve wires odnokov. The segmental apparatus of the spinal cord proved to be a link for the components of the IFS.

Fig.1. *Morpho-functional system*

It is possible to pursue conformity in the ideas of modern neurophysiologists about morpho-functional systems (MFS) with the concept of traditional Chinese medicine (TCM) about the twelve main systems corresponding to the corresponding meridians or channels. Thus, the main internal organ of the ISF is associated with the TsZAN or Fuorgan according to the theory of TCM, the skin representation of the ISF with the external course of the meridian, the tendon-muscle apparatus of the ISF with the tendon-mouse meridian, and the processes of neurons are the "internal course of the meridian" in the terminology of the TCM. All popular methods of electropuncture functional diagnostics (MEPD) are based on electric skin measurements (ECI) in the field of meridians. Interpretation of the obtained

values is based on the interrelationship of the skin and internal organs based on the community of segmental innervation. So it has developed historically that all these methods are ranked by the method of electro-puncture functional diagnostics (EPPD). But it would be more correct to single out two main groups, and more precisely two main directions of the search for new directions of electropuncture functional diagnostics:
firstly, a large group of methods of EPFD, among which the folle method (R. Voll) received the greatest recognition in world medicine:
secondly, segmental neuro-functional diagnostics (SNFD) methods.

Among the founders of the second direction (neuro-functional diagnostics), first of all it is necessary to mention Dr. J.Nakatani, who develops, known to most experts on reflexotherapy. Diagnostics on "Ryodoraku". The purpose of the diagnostic methods of conventional electropuncture functional diagnostics is to most accurately determine any electrophysiological property of the skin in the area of biologically active points (BAT) in order to further interpret this indicator. The purpose of the segmental neuro functional diagnostics is to study the response of the neural apparatus of the spinal cord in order to further interpret the degree of this response (see Fig. 2.).

Unlike electropuncture functional diagnostics, segmental neuro functional diagnostics methods use an electrode with a significant area of skin contact (about 100 mm2)). An important role in this kind of functional diagnostics is played by the shape of the active electrode, which uses an ebonite cup with a volume of 1 cm3. At the bottom of the cup is a contact lotus plate. Before measuring, the cup is filled with cotton wool moistened with isotonic sodium chloride solution. It is important to note here that it is unacceptable to wet the cotton wool filling the cup of the active electrode with water, in this case it is so saturated with the dissolved salts of the sweat glands by the end of the measurement session that it reduces its resistance to 5 kΩ and more so by the end of the measurement session see figure 3.). The main feature is a sufficiently large in power testing electric current with a voltage of 12 volts and a force of 200 μA, which can cause a segmental response that is meaningful for interpretation.

The strength of the current passing through the skin zone in the process of testing with neuro functional diagnostics rises to a certain value — the stage of excitation (Figure 3, A), which is associated with a drop in resistance of a given skin area in response to exposure. After that, for some time the current (and resistance) remains unchanged - the stage of exit to the plateau (Fig. 3, B), and further impact causes a decrease in the current-stage of braking (Fig. 3, C). Since the time of reaching the plateau (t1), the time duration of the plateau stage (t2) and the time of inhibition (t3) vary greatly with the neuro-functional diagnostics individually for each person and at each point separately, it is necessary to know the exact parameters, time of onset and end reaction (duration of stage B).

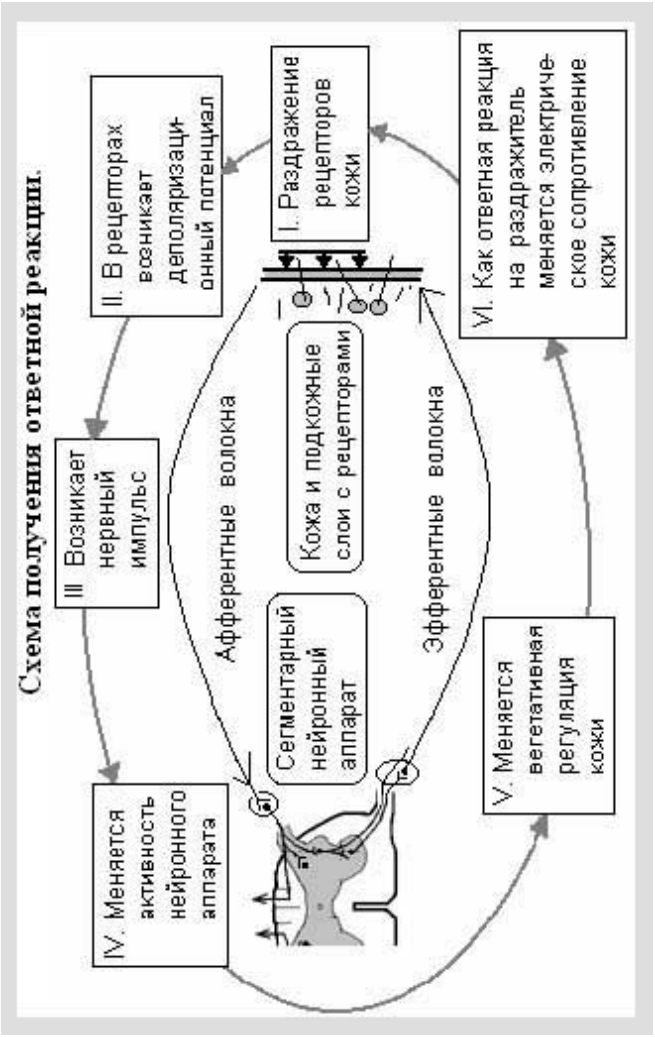

Figure 2. *The response of the neural apparatus of the spinal cord*

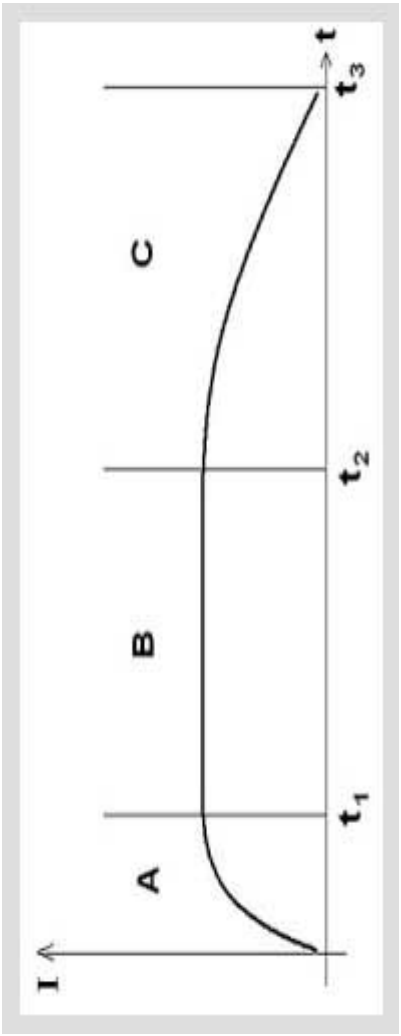

Fig 3. *Current of current passing through the skin zone in the testing process with neuro functional diagnostics*

The knowledge of the ancient physicians was used by the Japanese scientist Nakatani; he developed and since 1950 began to use a special method of electropuncture diagnostics. This method arose due to a number of reasons. Imagine: post-war Japan, the dire consequences of the explosion of atomic bombs, the country's economy is exhausted. How quickly, with minimal financial costs, to accurately diagnose the state of health of citizens? A special method of diagnosis was needed — simple in manipulation, inexpensive, giving reliable information. And Nakatani led the scientific work in this direction.

Over the years, Nakatani has tested the electrical potential of biologically active points on patients' skin with a special device. He noticed that some points that have a lower resistance than the surrounding skin are located along certain lines. And these lines coincide with the course of acupuncture meridians, which are described by Chinese medicine. Therefore, the lines and this method of Nakatani received the second name, “Riodoraku” (from Japanese: Rio is good, before electrosonicity, Cancer-line. At the beginning of his research, Nakatani measured the electric potential of each meridian. And he concluded that on each line there is a special point - its reducibility parameters coincide with the average reducibility parameters of the whole meridian. These arithmetic average points were proposed as diagnostic points. For ease of staff training, Nakatani called meridian points about the first letters of body parts: on the arms - the letter H (hand- hand), on the legs - letter F (foot-foot), etc. Nakatani also developed a special table, which indicated a certain “normal range” of the electrical conductivity of the points. All measurements, the coordinates of which fell into this “corridor", were considered the norm of health. The coordinates, which are located above the upper boundary of the "corridor", were related to pathology of inflammatory processes or the energy excess of the meridian. And the data that went beyond the lower limit indicated a degenerative process or an energy shortage of the meridian.

Diagnosis by the method of Nakatani. Assessment of the state of the body according to the Nakatani method is as follows. Specialist doctor measures the electrical conductivity of certain points on the body. For the purposes, search (negative) and passive (positive) electrodes are used. The results are immediately recorded in the corresponding columns of the map Riodoraku. Then the decoding and analysis of the data obtained using computer programs. The whole procedure sometimes takes no more than 10 minutes! Using the diagram, you can see in which mode, excited or depressed, each of the organs works, and you can see whether your body needs help or is able to cope with the problems that have arisen. Diagnosis takes its name from the Japanese doctor Nakatani, who described the new diagnostic method. Based on the acupuncture system, he studied the points at which acupuncture is performed. Nakatani found points with increased electrovisibility "electro-permeable points". He also found that such points were detected

in 9 out of 10 patients with kidney disease, while such points were not found in healthy people. It was found that the points of the patients coincide with the points of the kidney meridian, thus forming a line of increased electrical conductivity. This line Nakatani called Ryodoraky (literally, "the line with good electrical conductivity"). Continuing the study, Nakatani came to the conclusion that any changes in the internal organs will certainly affect the skin. Later it was recognized that the phenomenon of Ryodoraku is noted not only in connection with diseases of the organ, but also reflects its physiological changes. Simply put, this diagnostic method gives a complete picture of the state of the internal organs. The organism by means of points and the meridian itself tells about what happens to it. Signals about their "sores". Diagnosis according to Nakatani is completely painless, non-invasive, it takes less than 5-8 minutes to complete. This allows in detail, at the deepest level, to follow the course of treatment.

The merits of the Nakatani method:

First of all, it is sufficient simplicity and high reliability of determining the pathologies of various systems of the body. One session of computer diagnostics replaces a visit by a patient to 10 different specialists, which makes it possible to save considerably both time and money.

Secondly, such a diagnostic method reveals screened diseases, even several years before they show themselves. This allows you to take appropriate measures during. Having determined the level of "energy failure" in the body, the doctor can select the complex of rehabilitation therapy, monitor its effectiveness and adjust it.

When working with the “Ryodoraky-UZ” hardware and software system, the measurement results are automatically entered into the Ryodoraky map. The program calculates the physiological (individual) corridor of the norm. Using the principles and laws of traditional oriental medicine, the program determines the syndromic diagnosis and recommends points, zones of influence. A physician can simulate a “virtual treatment” and evaluate the intended effect.

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