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PECULIARITIES OF QUALITY MANAGEMENT OF DIGITAL PRODUCTION OF DEFECT-FREE AND IMPORT-SUBSTITUTING TRUE FOR CONSUMERS SFD AND SCF (2 MESSAGE)

Abstract: *In report 2, the authors analyze the possibilities of policy and objectives of the company in the field of quality within the QMS in order to fight for defect-free production, reduction of marriage and guarantees consumers high quality of manufactured products. The use of Pareto charts allowed us to visualize the efficiency and effectiveness developed by the authors of the policies and objectives in the field of quality within the QMS to ensure defect-free production with a substantial decrease in the production of defective products. The need to improve the quality management system in the light industry is due to the following important reasons. First, it is increasing the confidence of potential consumers in the products that the company produces. Secondly, it is an opportunity to significantly strengthen its position in existing markets, as well as significantly expand its sphere of influence by entering new domestic and foreign markets. And thirdly - it is a significant increase in productivity of any industrial enterprise which is supposed to introduce QMS using participatory management.*

Key words: *QMS, certification, import substitution, demanded, conformity assessment, standardization, audit, demand, defective products, Pareto chart, quality policy and objectives, documentation, effectiveness, efficiency, responsibility.*

Language: *English*

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Introduction

We continue the long search for an idea that would unite the nation. The quality is not visible even next to what is offered. Engaged in quality seriously only enthusiasts, wading through the "thickets" of democracy, apathy, etc.

Our "steering" is not up to quality. "Captains" still pave the way to the West and invest not in the

native economy. Paradox: investments of foreigners in the Russian economy in the near future will exceed the contribution of compatriots.

Having lost the prospect of becoming an oligarch and feeling the pressure from the fiscal services, the candidates for oligarchs are looking for happiness in distant countries.

The Japanese concentrated capital in their home country. Patriotism meant more to them than personal gain. This is the reason (not the only one) for the "Japanese miracle".

The allies in 1945 destroyed all that was in the Japanese Islands, in addition to national self-respect. And it became a launching pad for the revival of the country. We emphasize that the specific mechanisms of turning quality into a total interest of the nation, the Japanese are actively looking for in the practice of organizing quality service in the USSR: "personnel decide everything!", "Quality – the main attention!", "All at the service of quality!"– is the slogan of Soviet history. And behind them there was a rigid party and state control.

The Japanese in the struggle for quality subordinated all national and state (municipal) reserves, forcing work on the quality of even television. Significantly – the media were not limited to advertising quality. They organized schools, courses, universities to teach the quality of key figures: masters and foremen. National finances were directed to education and training of high-quality work, its organization.

What we have? Quality is at the mercy of all those who make a profit from learning and education. What they did was squeeze the problem into the promotional product.

We do not have a national quality assurance programme. We do not have a state priority project (along with well-known national projects). It seems that, having officially declared support for international quality systems, the highest political management of the Russian Federation considered its mission accomplished, deciding that the rest will regulate the market.

E. Deming's ideas were continued in the concept of another American who worked for the "Japanese miracle", Y. Jurana. Th. Juran has shifted the focus in the development of a quality management system with statistical methods in the direction of absolute values of the customer, dividing problems occasional or chronic. Accidentally (suddenly) emerging problems quality single (single) origin. They are immanent to production itself. To solve random problems should be in working order within the current management. To that end, the responsibility of managers for monitoring measures and the timely introduction of corrective measures should be clearly defined.[1-2]

Another thing is the problem of chronic order. They are present in the process and as if "planned" initially. Th. Juran understood chronic problems as the result of assumptions made in the previous phase of the process. Up to a certain point, such tolerances do not significantly affect the quality, further, under the influence of the conditions of implementation and their own movement, they become essential and are made unacceptable. It is a chronic problem. Juran "accused" of stagnation or loss of quality indicators. The company's management should not be complacent about the good performance compared to the previous period. It is necessary to look not back, but forward, otherwise it is easy to get into a crisis situation.

It is pointless to try to solve chronic problems with orders. We must begin by identifying their main causes and sources. Here is required collegial form of analysis of what happened – "brainstorming".

The second half of the twentieth century was marked by an intensive invasion of the quality management of mathematical methods of process research. There was a new scientific discipline – the theory of management decisions, which was the development of operations research. In decision theory, the focus was on decision making. It was interpreted by a process available for quantitative measurement.

The work was carried out in two directions. Supporters of the first of them tried to find mathematical models suitable for use in real production situations (Fogal, Luce). The developers of the second turned to statistics, game theory, widely involving methods of statistical testing ("Monte Carlo method").

The one-sidedness of both approaches gave rise to the third school, its founders wanted to maximally "bind" mathematical research to the problems of quantification of economic phenomena. As a result, there was a so-called "econometric" approach to the analysis and management of economic processes, first of all, efficiency and quality of production.

According to the above concept, the economic and mathematical model should have four components:

1. It should include economic phenomena of qualitative content, expressed in certain units of measurement. These values are the parameters of the model;

2. It should include certain quantitative relationships and dependencies between parameters. These may be balance relations or more complex dependencies linking the results of the processes with their causes;

3. The model should determine the area of permissible changes in the parameters of the model in time, space and volume – "restrictions on quantitative dependence»;

4. It should be a system of interrelated parameters, dependencies and constraints with specific inputs and outputs.

Management of such a system, that is, obtaining certain results at the output, should be carried out by influencing only the input. Without interfering with its internal structure.

The most famous economic models are listed for L. Klein and A. Goldberg. V. Leontiev, who received the Nobel prize for his work, also contributed to the mathematical modeling of economic activity.

The efficiency of economic and mathematical modeling of relatively large-scale economic phenomena is not high. Without denying the importance of such modeling, the prominent economist T. Haavello wrote: "It is possible that as we develop more and more advanced methods, we will come closer to the realization of one unpleasant fact: economic "laws" are difficult to be accurately measured, and therefore we live in a world of large, but largely superficial or false correlations. You can, of course, refer, as always, to bad statistics. However, I think we can find explanations in another, namely in the imperfection of economic theories."

Quality management is an exception. In contrast to the low efficiency of the use of mathematical apparatus in the study of the economy as a whole or separate branches, the application of mathematics to quality management was quite acceptable action. Its opportunities actively enjoyed and Deming and Juran.

The analysis of the economic strategy in the field of quality management shows that the effectiveness of quality management depends on the agreed macro and microeconomic views. This teaches and real Japanese experience. The solution of the quality problem itself involves a step-by-step process from the definition of problems, through the diagnosis of their condition and the search for solutions, to the implementation of decisions, retention and development of the results achieved.

At the first stage. Juran called "problem, in which programmed decision," singled out problems, identify priorities, set ranking order; identifying actors and their powers.

At the stage of diagnosis, the optimal symptoms of the condition are determined; hypotheses are built, checked; the search for causes is carried out.

The stage of finding solutions involves finding the best solutions; development of necessary measures; implementation of decisions.

The final stage consists of checking the effectiveness of the implementation results, comparing the dynamics of the achieved results with the planned ones.

High efficiency the concepts of Deming and Th. Jurana provoked F. Crosby to combine their systems with the experience of quality management accumulated in the United States.

The program "Zero defects" F. Crosby was not something fundamentally new in the theory of quality management, but it contained interesting ideas. For example, the statement about the prevention of defects; the need to develop a "quality policy", the requirements for connecting to the quality of non-production units.

F. Crosby considered that each technology area must be engineer in charge of quality. His professional duties include the presentation of a daily list of problems that cause significant and frequent defects; systematization of their degree of importance for quality; definition of corrective actions; involvement of personnel employed at the site.

The "phase of continuous quality improvement" helped to overcome the contradiction between quality costs and production efficiency. The consumer began to receive a quality product at an affordable price, the realization of the idea of "consumer society" approached.

From the manufacturer's point of view, the situation is ideal. But the assessment of the situation was one-sided, only from the position of the consumer; the quality parameters were not set by the one who consumes the goods, for whom the product is made. Quality was standardized in the norms of the manufacturer and, of course, reflected primarily its own interests. The consumer was left with a choice: to purchase goods of a certain quality or to refuse. [3-4]

This again led to the "overheating" of production, to an increase in its cost, as frequent were miscalculations in determining the needs of consumers. High-quality (according to the manufacturer) product, affordable, did not find the necessary demand from consumers.

It was necessary to eliminate the new form of contradictions taking into account the interests of the consumer. The "continuous quality improvement phase" has given way to the "quality planning phase".

The beginning of the next phase is considered the work Of G. Taguchi. It was he who introduced the concept of "loss function" into the theory of quality management and developed a modern method of planning industrial experiments. The purpose of Taguchi's research was to overcome the contradiction between quality assurance and production efficiency in its existing forms.

Four new ideas form the basis of the quality planning concept:

1. The conclusion is that the defects of products are mainly due to poor quality actions at the design stage.

2. Conclusion about the need to focus the main products not on full-scale testing of models of goods, but on mathematical modeling of both goods and the process of their production. Due to this, they expected to timely detect and eliminate the causes of the increase in marriage. Design and technological processes were proposed to be taken under control up to the stage of real production.

3. The idea that the concept of "zero defects" should be replaced by the idea of "satisfied customer".

4. To emphasize high quality of goods with reasonable price and constant price reduction, thus ensuring steady market demand for qualitative goods.

A new round in the development of quality management has overcome the marked form of fundamental contradiction between quality and production efficiency, but not the contradiction itself. Currently composed of its regular "environmental" form.

The inclusion on the quality characteristics of product environmental cleanliness require a significant investment.

The peculiarity of the modern stage of quality management is that all known formulas (phases) are practiced at enterprises. B. S. Aleshin with co-authors, reflecting this unusual way of existence of history and modernity built a "quality Tower". It is of both theoretical and practical interest (figure 1).

In the seventies, A. Feigenbaum summarized the accumulated intellectual and practical experience in the development of the problem of economic quality management and laid the Foundation for what is now known as TQC-Total Quality Central (total quality management).

fig. 1. «Tower of quality" by B. S. Aleshin

In essence, TQC is not a quality management system, but a system of sufficient conditions for a quality process. The logical development was for the development of TQC. All previous steps on the way to quality management, despite the progress of the movement, were of the same type. They "tied" the solution of the problem of economic quality management to any fragment (fragments) of the process. Thus, the improvement of quality management "bypassed" the essence of the production process – its unity and the systemic nature of its unity as a certain way built relationships and dependencies.

The closest to understanding the quality system as a reflection of the production system came E. Deming, K. Ishikawa, F. Crosby and A. Feigenbaum.

The main conditions of TQC can be considered as the following:

ensuring the totality of participation in solving the quality problem of all employees;

awareness of total responsibility for the quality of all participants in the process, the understanding that no specialized unit (OTC, OUK, etc.) is not able to cope with the task;[5-6]

compliance of the quality of activity with all stages of the "life cycle" of the product: from the development of the product concept and marketing research to the method of disposal of the product and its packaging. In the context of increasing environmental requirements in some countries, such as Japan, product certification involves the mandatory development of a method of recycling even packaging;

the totality of improving the knowledge and skills of performers and managers; the regularity of specially organized forms of training; planning of appropriate costs;

achieving a total understanding of the fact that the quality of work is achieved not so much by technology and technology, but by focusing on the quality of employee motivation, and motivation should not be one-sided, closed only on financial returns. Then it will be stable;

the totality of structuring activities, its differentiation into operations, interrelated processes, transitions, and each link of the process should be clear to all performers. Studies of elimination of the causes of defects have shown that up to 90 % of the

problems submitted for consideration are solved, while 75 % of them are able to solve themselves supervisors (direct performers and organizers);

totality in the understanding of the consumer; the consumer is not someone who is outside the brackets of the production process, the consumer is every next link of the production itself – "internal consumer", so it requires awareness of responsibility to the consumer throughout the production cycle;

total cultivation of the special status of the consumer and his interest in the quality of the product;

continuous quality engineering;

understanding the importance of defect prevention and its economic advantage over defect elimination;

team spirit of all participants of the process; corporate culture;

leading position in the activity providing quality, top management, understanding of quality as the purpose of entrepreneurship.

Quality management in the XXI century is based on the reciprocity of General quality management (TQM) and quality system standards (ISO 8402; ISO 9000; ISO 9001). The main difference between the quality system standards is that they are in many countries, including Russia, acquired state registration, fixed administratively. Therefore, clarity in the definition and content of the concept of "standard"is important. In the USSR and the Russian Federation decided to assign a "quality mark", officially indicating that the product meets certain agreed parameters. "Standard" in Russia and most other countries is a set of rigidly fixed, often administratively, characteristics of products, services, activities. Analogues of our "quality marks" are found in European countries, in particular in Sweden (TCO 92; TCO 95; MPR on monitors). The concept of "standard of technological modernity" (industrial standard) is developed on its basis the Bologna Protocol is constructed.

In terms of consumer interests, the "standardized" concept of "standard" is not as relevant as for the manufacturer. The last, using starting advantage, considering first of all the interests. Hence the conventionality, the relativity of any standard and the "sign of the standard" as long as the standard does not balance the mutual interests of both parties: the manufacturer of the product and its consumer.

The most common ISO 9000 quality system standard is based on the idea of a special organization system. The basis of this idea is the thesis about the documentation of all processes related to the production: purchase of raw materials, components; preparation of production of its organization; delivery of products to the consumer; providing warranty support; scientific and technical equipment of production; personnel management.

As a result, the concept of "quality" acquires new facets, expands; the traditional understanding of quality is modified. The content of the concept of "quality" is loaded with knowledge corresponding to the changed situation. A classic example of the dialectics of the concept.

The most obvious illustration of this is the rather frequent reports that reputable firms "Ford", "Toyota" and others withdraw their products due to the detection of technical inconsistency in only one any node.

It would seem easier and cheaper to instruct service centers to replace substandard components. In fact, firms do the right thing, given the market competition and the place of their brand on it.

In a complex system, the structural and technological defect of one unit inevitably affects the entire system, so it is not easy to replace the unit, the unit. It is necessary to thoroughly test the product as a whole, so that the manufacturer's guarantees work according to the declared standard.

ISO 9000 its modifications ISO 9000-2000 do not guarantee the quality of products. They are "set" to provide such production conditions that allow to count on "the most probable" qualitative reserve of productive activity.

Another "weak" side of these systems is that they explain "what to do", but there is practically no explanation "how to do it".

The ideology of ISO 9000 argue: "What should I do?"– the question is "standard" and is subject to standardization. The question is: "How should I do?"– due to the specific conditions of production in each case. Therefore, "how to do" should be decided by producers on the spot.

With the introduction of ISO 9000-2000, the concept of "SC" (quality system) is outdated, giving way to the concept of QMS defined by the International organization for standardization:

continuous monitoring of consumer interests;

systematic leadership of the head, ensuring the unity of goals and activities of the company, as well as a stable internal environment based on cooperation and comprehensive motivation;

maximum involvement of employees ' abilities, knowledge and skills in the production process;

use of the process approach in the management of activities and resources;

the need for a systematic approach to management;

striving for continuous improvement of the company's activities;

decision-making only taking into account a comprehensive analysis of all possible " information for reflection»;

development of mutually beneficial relations with suppliers.

From now on, international quality standards require to submit to the "quality mark" is not the goods, and the method of their production. "Quality" – is the compliance of the organization and

management of the enterprise quality management system (QMS).

The modern history of the economic aspect of quality management reveals a very instructive relationship of specific scientific, special and philosophical approaches to solving socially relevant problems of industrial activity.

Philosophical doctrines about quality, undoubtedly, always had an effect on economic knowledge. K. Marx began with G. Hegel, passed the "course" of economic analysis and founded a historical and materialistic view of social development. Then he returned to the analysis of Economics and left an impressive mark in social philosophy and economic theory. Something similar can be said about the creative ways of O. Proudhon, J. St. Millie.

History repeats itself in a new round. Thinking economists go from practice to philosophy to use philosophical knowledge and method to develop a deeper understanding of the subject of their own research. All of the modern concept of quality management required philosophy no less than of economic theory.

Legal aspect

Philosophical analysis of the social process led to the conclusion about the increasing role of "subjective factor". The "human factor" in philosophical humanism has always been a decisive condition of history. Such was the opinion of the leading thinkers of Antiquity, Renaissance, Enlightenment. But the "human factor" and the "Subjective factor", contrary to the common practice of their rapprochement up to identification, are not the same.

"Human factor" is a concept that characterizes the whole complex of human capabilities. The concept of "human factor" expresses the duality of our nature – a combination of biological and social; organization and personality; physics, physiology, psychology, intelligence, behavior and activity. He loves to present is: "all in one" or "the package".

The "human factor" is, in fact, the person himself in the context of his opportunities to realize his own potential. Smart, educated Oblomov, lying on the couch, as well as active Stolz – examples of contrasts along with the name "Human factor".

For the definition of "person in action" – no matter what: tumbling with the newspaper in the hands of Oblomov, either active enterprising Stolz – needed synthetic concept. It was proposed to call an abstract person in the state of abstract activity "human factor", thus including an abstract person in the abstract historical process. In theory, the main thing to find a conceptual equivalent to describe the object of study.

The object of research in our case is social progress. The task is to understand the factors that set history in motion and give the movement of the history of progress. The logic of reasoning is not complicated. The history of mankind is either the objectification of extra human substance (objective idea, World mind, World Will, God, etc.), or the product of the activities of the people themselves: their mind, feelings, will and practical activities.

The problem can be simplified, because both variants provide for human activity, with the only difference that in the first case history is made by him according to the program developed outside of human life, and in the second man paves the historical path, guided by his own ideas and motives. In history, it does not say, from the human not to move. History is "tied" to man as he is "tied" to history. Then it becomes relevant to "disassemble" the human factor" on the components of its quality, to divide what is in the person exists exclusively in unity. Share conditionally, depending on the contribution to the historical progress of the two "halves" of man: biological and social.

There is a concept of "subjective factor" and its components – "individual" form of subjective factor, and "collective form of subjective factor". With regard to production and quality of production, the "subjective factor" is specified to the level of "performer", "Manager" and "team". To those who will object to us, having counted that we have narrowed understanding of the person in structure of an economic form of its activity to the sizes of "subjective factor", having ignored its biological status, also presented in production and influencing its quality, we will answer: no, modern production, that is production knowledge-intensive, hi-tech, relying on force of knowledge, instead of muscles; on responsibility and organization, depends on "subjective factor" of the person.

The logic of development of the process of economic quality management convincingly shows that total quality management, to which in General everything went, is possible with the total mobilization of subjective human forces: knowledge, beliefs, desires, will of interests, education, education, concentrated in the professional form of culture.

Classics of the economic theory of quality management from Taylor to Crosby and Feigenbaum was seriously concerned with the mobilization of motivation of participants in the proceedings, correctly believing that it is the life force of quality of work. But they were realists and realistic experience told them: do not absolutize the moral factor, no matter how significant it was. Quality is created by free will, but is controlled administratively and legislatively. The legal aspect of achieving TQC objectives is very significant and requires constant attention.

It is possible to imagine a situation where the quality will be achieved only through the self-organization of the manufacturer, thanks to the team spirit, social commitment of each and every

individual, a high level of professional qualification? The answer – at the discretion of the reader, but the hint arises: it is possible.

What would it be? Legal regulation – it is optional, unnecessary? No. Trial fantasy does not take into account the purpose of production, which, by the way, is very well spelled out in TQC.

The purpose of production is not the quality of the goods (this is a crafty goal, self-deception). The purpose of production is not the quality of production (this is also cunning). The purpose of production – customer satisfaction!

Production, even in a natural economy in which the producer and the consumer are the same person, does not exist in itself and for itself. As for the commodity form of production, the consumer is the main figure in it. Therefore, the understanding of quality is not only in the competence of the manufacturer. It is formed in the mutual interest of the manufacturer and the consumer in the properties of the product (and its price), intended for sale.

The producer has one small advantage in relations with the consumer. It is not easy to use, but the chance is real. The manufacturer of technically complex products that require knowledge and skills in operation, can try to form a taste for it by consumer education and advertising. The mechanism, of course, is expensive, but otherwise it is unlikely to win sharp competition in the market.

The interests of the producer and the consumer do not always coincide, not immediately and not for long, because it is the interests of the subjects of production, separated by the barricade of the market. The market is a ring for them. The manufacturer is interested in profit. The consumer is in the preservation of Finance. One seeks to fill a cashier, the other is not empty purse. At the same time, both look at quality as a reward for winning the battle. Legal regulation helps to make the fight civilized. Prevent cheating.

The state can not be aloof from the events taking place in the market, because the economy gives rise to politics; the movement of the market causes the movement of large social groups. And if today the class struggle has lost its relevance, tomorrow the place of the proletariat and the peasants will be taken by the unsatisfied – who quality, who price – consumers, the number of which will be no less, and the desire to win even steeper.

The fate of each individual citizen is beyond the power of the state to deal with, and it is hardly advisable, but the fate of social groups should be in the zone of special attention of any state and always, if, of course, the state itself does not want to be in the zone of special attention of the main part of society, which in quiet times is called the electorate, and in troubled times – the people.

Quality is a policy, first, and only, secondly – a product of intricacies of the relations in the market. Supporters of absolute liberalization of the market are "scientists" provocateurs of tension in public relations and "subversives" of national security.

All modern social experience confirms that participation in quality management is a function of the state and even interstate cooperation. An example is the Bologna agreement. It was prepared by the social movement, but to give it the real power of the controller of the quality of education, legalized by the collective political will.

"The attention of the state should be focused on:

intensification of the process of import substitution by improving the quality of domestic products;

to increase the production capacity of enterprises, the creation of advanced technologies and new types of high-quality products in order to expand the share of Russian products in the domestic and foreign markets as the domestic market develops and integrates into the world economy."

Updating the legal resources of the state throughout the vertical of political power in the field of quality management will undoubtedly contribute to the achievement of the following important results:

ensuring the quality of life of the population, without which it is impossible to get out of the demographic collage;

strengthening security, territorial integrity, prevention of military aggression;

strengthening of Russia's position in international relations, greater compliance in economic partnership;

creating the image of Russia as a really great, not just a huge country;

development of environmentally sound policies and economic practices.

Integrating the analysis of the real consequences of the intensification of the state's behavior in the quality market, we note the most important thing. This is the only effective way to ensure national security, that is, what is in the ranking of the tasks of the state above everything else, since the achievement of everything else is possible only in the conditions of national sovereignty.

A systematic approach to solving the problem of quality in the USSR began to form in the 50s. Saratov system of faultless manufacturing of production rule systems CANARE, KS UKP has been quite a successful experience of socialist realization of the necessity of production quality management.

In the mid-60s, the Lviv initiative, which was recognized as a "system of faultless labor" – STB, became widespread in the domestic industry.

The highest achievement of the "struggle for quality", apparently, was the creation on the basis of a combination of a serious experiment (VNIIS) and a comprehensive generalization of practical work to improve the quality of work at the advanced Lviv enterprises of a Comprehensive product quality

management system (QMS). This system was the first where the organizational and technical basis of product quality management became the standards of the enterprise. Unfortunately, the effectiveness of best practices has not been high. By the early 90-ies only 10 % of technical products for civil purposes corresponded to the best foreign analogues.

The state has large and multi-level opportunities to influence the quality of production and product quality. The legal mechanism, which is in the hands of the state, can affect both directly the improvement of the quality of the production process, and indirectly. With the help of tax policy, it is possible to stimulate quality production and block poor quality. Protecting the consumer from a low-quality product, the state actively prevents unfair producers from entering the market.

The basis of the legal quality of production in our country is the Constitution of the Russian Federation. The Constitution of 1993 was developed in the midst of the redistribution of property and, therefore, its creators have done everything to position (of the article) of the Supreme Law was very abstract, declarative.

Article 41 of the Constitution States: "Everyone has the right to health protection." Of course, it would be better to add – "and a healthy lifestyle." And even better: "the right to protection of health and a healthy lifestyle of citizens of Russia is guaranteed by the state". However, in this case would suffer "legitimate" interests of future oligarchs, so we stopped at what we have. There seems to be no direct relation of this article to legal quality management. There is an indirect, indirect protection of the population's right to health.

Goods of direct and long-term consumption must have the necessary level of quality, so as not to harm health. Otherwise, there are serious legal, financial sanctions against the manufacturer and the seller.

In order to ensure the protection of the right to health care, all possible tolerances (MPC), sanitary and hygienic requirements, state standards of products, services, industry standards have been developed, and the company has its own "standards" of enterprises (TU). Were created governing structures or modernized inherited from the socialist time.[7-8]

On the basis of the rights of citizens to quality goods proclaimed by the Constitution, a modern structure of legal support for quality management has been built. The state does not interfere in the technology of production quality management. Its activities are aimed at controlling the method of production to exclude the possibility of damage to the health of citizens (and non-citizens) and harm to the natural environment of human activity, as well as to prevent the appearance on the market of dangerous low-quality goods, consumer fraud and legal regulation of relations between the seller (manufacturer) and the buyer in those situations that require such a measure.

The market is designed for environmental activities within the framework of normalized relations. Prices, priorities, demand, supply, advertising are all mechanisms of the market as long as they are within the moral same markets of economic relations. The scheme of the right quality management is shown in Fig. 2.

Many violations of economic relations necessarily lead to the intervention of law enforcement agencies designed to protect the affected entity within the framework of the current legislation.

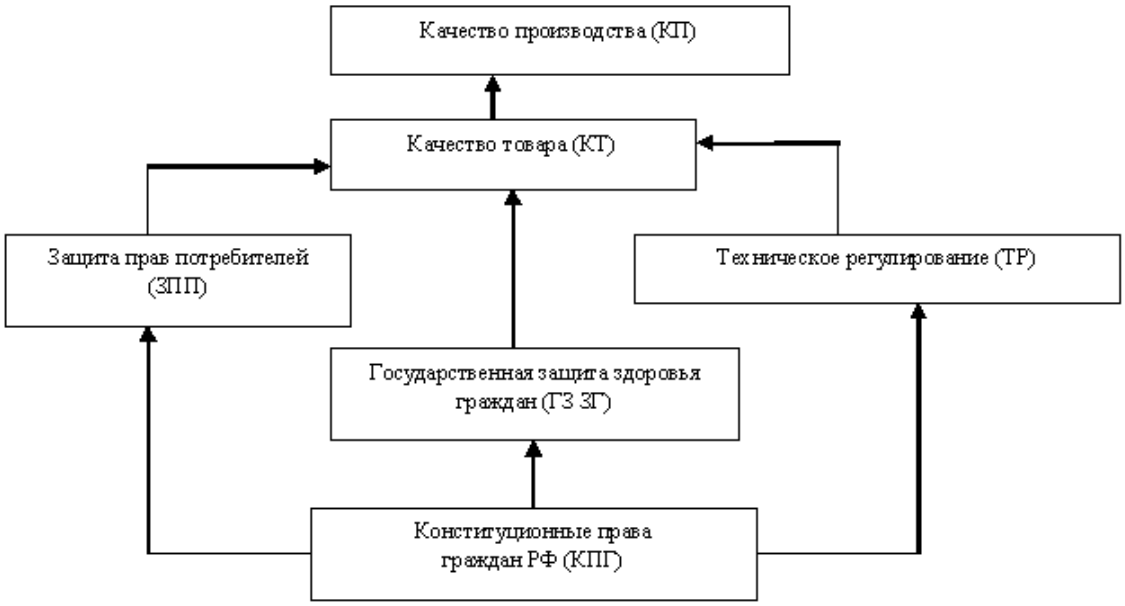

Fig. 2. Scheme of the right quality management assurance

Any act of "purchase and sale" is a subordinate act, and the legislator or the executor is obliged to be included in the process, otherwise the rights of the owner will suffer and the violator of market relations under the jurisdiction will not be punished.

The situation with the legal support of quality management is complicated. The market divided the producer and the consumer, having squeezed between them the intermediary (and not one). In this connection it is necessary to differentiate concepts: "quality of production"; "quality of goods made" and "quality of goods acquired" by the consumer.

The intermediary – "speculator" – is quite capable to break technical conditions at delivery of goods to the place of realization, in storage of goods, its preparation for sale. As a result, the quality parameters of the product will change. The legal protection of the consumer spelled out all possible situations and measures of responsibility of the seller.

Consumer protection legislation has been in place in Europe and North America for a long time and has been polished for centuries. In its current state, it is quite effective, forcing violators to reckon with it in order to avoid serious financial sanctions deadly-like anti-advertising.

Russian experience of legal regulation of relations in this area is much poorer, besides it was formed in the specific conditions of the socialist market. The law of the Russian Federation "On protection of consumer rights" was adopted in 1992 and repeatedly edited (09.01.96; 17.12.99; 30.12.01) in order to make it more adequate to the developing economic situation.

The subject whose interests are protected by this law is the consumer who purchased the goods, or rather, the goods that do not meet the entire set of consumer and technical characteristics. And the object of legal relations is the quality of goods.

Thus, the Law has a double force: it protects the buyer from low-quality products and protects the market from low-quality goods. The manufacturer (and the intermediary) received a legal signal about the need to introduce quality products to the market.

In the peripheral zone of interest of legislators was the activation of a number of Federal bodies: standardization, Metrology and certification, sanitary and epidemiological surveillance, environmental protection and natural resources.

The categorical apparatus of the Law on consumer protection were the concepts: "consumer", "manufacturer", "seller", "standard", "lack of goods", "significant lack of goods", "safety of goods". As you can see, in the categorical apparatus of the law there is no mention of "quality", despite the fact that it protects the consumer from low-quality goods, and the doublet tries to protect the market from marriage and counterfeit products.

The developers of the ideology of the Law acted logically. They divided the content of the concept of "quality of goods" into components: "manufacturer of goods", "performer", "seller", "standard", "consumer", building a system of them, the forming factor of which made the "standard". The relationship between the consumer and the producer is regulated in the Law by the concept of "standard", which is subject to change in a certain system of units.

"Standards" are understood as existing in two levels: universal, controlled by the state, and industry, private, established independently by producers, and passed the necessary certification procedures.

According to the logic of building subordination relations, the requirements of a higher level of organization are the reference points for the rest of the "pyramid". In case of contradiction, the advantage belongs to the one who (or what) is higher, i.e. more important.

To introduce into the conceptual apparatus of the Law the concept of "quality (goods)" was unnecessary. It was successfully replaced by a more verifiable concept of "standard". At the same time reminding all market participants from the manufacturer and the contractor to the consumer who is the owner of the house.

From a philosophical and economic point of view, the main drawback of the law is the locality of purpose. The state is still under the hypnosis of the effectiveness of economic liberalism of the American model, overly in the expression of its economic interests forgetting that these interests are not public administration, and the people of Russia. The state, especially the Executive power as the Supreme Manager, should realize the interests of the people, instead of being afraid of being misunderstood by foreign partners. Foreign partners, when necessary, tighten the nuts tightly.

The state should pursue an economic policy with regard to quality on a larger scale, then its effect will be greater and private judicial practice dealing with private claims against the seller for defective goods will be sharply reduced.

It is necessary to protect the market from low-quality goods, as G. Ford Sr. did in his time, when he instructed the "phase from rejection" to special production, removing quality control from the brackets of the main production process. As a result, the Assembly line stopped receiving low-quality components.

The state does not need to strive to be a subject of the market, it needs to be above the market, stimulating producers of high-quality goods and preventing poor-quality goods from entering the market. In the first case, economic incentives are required, in the second – administrative and criminal sanctions.

Now the state stands to the problems of quality management, as it were, in half a turn, modestly distancing itself. It is necessary to turn to face him and take up the quality, "rolling up his sleeves." Only then

will the time come when the Ministers will not be able to postpone the execution of the President's instructions by their power for years.

Main part

Quality, properties, measure, before the appearance of human interest in them, were only objective natural characteristics of things, the processes of their formation and transformation. Accumulation or reduction of quantity led to a critical mass – the boundary of "qualitative quantity". The measure that characterizes the quantitative interval, the limits of quality development, warned that further change is advisable only in other qualitative terms, of Course, the quantity itself is not able to go into quality. A new quality arises from the quality of the old. And the way you change the quality is different from the way you change the quantity. Quantitative changes are continuous, qualitative, by definition, – discrete.

The emergence of human activity has significantly changed the understanding of quality and related characteristics of being. Social and historical processes of nature development were added to the natural and historical processes. Man actively began to rebuild the natural prerequisites of his existence, considering them as the raw material base of the struggle for their own existence. One should never forget that the essence of man is practical. F. Engels was absolutely right when he asserted that man is, of course, a creative being, but before creating and surprising, he must eat, drink, dress, put on shoes and have a reliable roof over his creative head. It does not find necessary in the ready form in the nature therefore the basis of existence of the person and its progress will always be practical activity, material production in all variety of its directions, by the way, too defined by a variety of human needs.[9]

To two objective, natural dimensions of quality – natural properties and dimensionality is added the third – quality assessment in the projection of the needs of human existence, combining objective and subjective principles (figure 3).

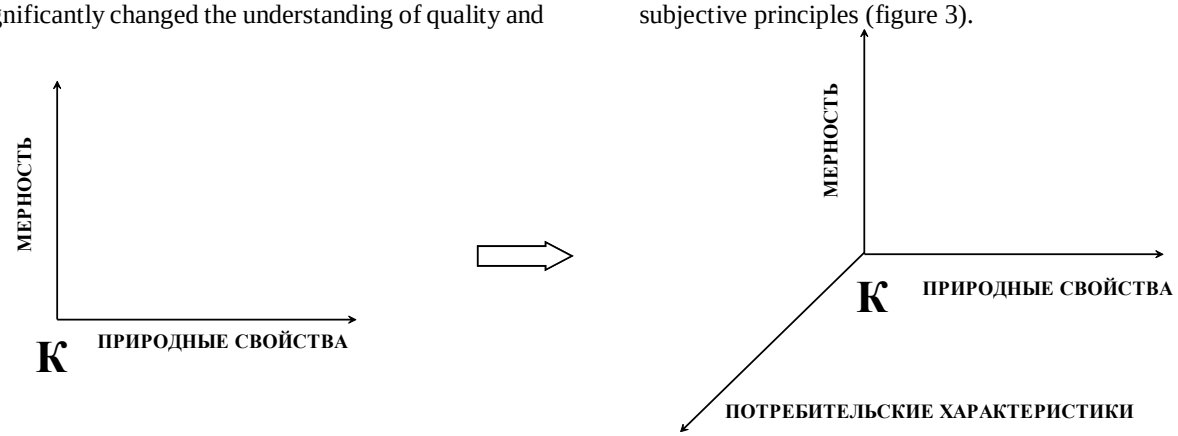

Fig 3 The development of ideas about the measurement of the quality

Historically, the range of quality carriers has changed. Today it includes, along with the quality of objects of the material world, the quality of raw materials, semi-finished products, final forms of commodity products, software, phenomena of spiritual culture, the most creative activities of people and ways of preparing for it – the quality of professional education.

Qualitative changes in the scope of the concept of "quality" through the inclusion of new phenomena that require qualitative characteristics, involve changes in the content of the understanding of quality, it is necessary to load it with new concretizing features. Even in the first approximation, the insufficiency of extrapolations of qualitative characteristics of natural phenomena, for example, solar radiation on the quality of raw materials, direct consumption goods or services is obvious. However, the set of basic characteristics of quality, expressed in its definition, remains invariant.

The modern understanding of quality has gone beyond the traditional understanding of "quality" developed in classical philosophy, but one should not think that the philosophical definition of quality is outdated. Philosophy is a historical type of worldview, and its analysis of the fundamental characteristics of being is of universal importance. The philosophical definition of quality is a message to be followed in specific time or subject circumstances. Over time, not so much the philosophical understanding of quality as the view of the quality of special and practical consciousness changes. Knowledge goes back from General abstract ideas to a specific understanding of the phenomena of the world and their properties. This movement of knowledge does not negate the original understanding. On the contrary, we are guided by it as a navigation device, making our way in the world of urgent problems.

In the system of philosophical categories "quality" reflects essential definiteness of the phenomena thanks to which they appear such, instead of others. The famous German philosopher G. Hegel wrote: quality is that, losing what, the phenomenon ceases to be itself. Defining quality as a system of

essential properties of the phenomenon, the philosophy distinguishes two aspects of quality definition, allowing to concretize the General methodological characteristics. Quality characterizes as a set of similar phenomena, and a single phenomenon of a certain set. This differentiation is important in the development of quality standards and no less important in terms of the validity of individual consumer claims [10].

Another important nuance in the definition of quality is that quality is not a collection of General properties of phenomena, but a system, so the exclusion or movement of individual properties, for example in the rating classification, is not allowed. The quality is either there or it is not. Less quality can not be more too. Quantitative variation applicable not to the "quality" and "quality".

The concept of "quality state" – "quality state" – key in the development of specific scientific, industry-specific ideas about the quality of specific phenomena. Unlike the concept of "quality", which is an ideal and serves as a reference point in the development of precise standards, the concept of "quality status" is usually included in the development of regulatory provisions. The concept of "state of quality" is developed at the level of knowledge that allows you to actively involve specific and quantitative possibilities of determining quality.

"Quality" is defined through properties. "Qualitative state" is characterized by a certain set of properties and their quantitative assessment. Essentially, we operate primarily exactly views on the quality, meaning the quality as such. Otherwise, in practical thinking and should not be, because it determines the real subject process or its results.

In the way of our knowledge of the contradictions of the world has placed a lot of traps. They are designed and on the weakness of our psyche and the "inclination" of intelligence. In the quest to understand the as a particularly dangerous one-sidedness and inconsistency.

The one-sidedness of knowledge is manifested in the desire to put everything in its place – "on the shelves", according to the rule – "to each his own", "God – God", "Caesar – Caesar". Philosophers develop the doctrine of quality, others use the achievements of philosophy. When there is than enjoy – praise, when there is no – revile. The position is convenient, allows you to write off at the same time with others and their own "sins".

Universal concepts of philosophy, including the category of "quality", are not eternal ideas of Plato, access to which is open only to philosophers. Philosophical concepts reflect the level of aggregate thinking, its achievements and shortcomings. The core of philosophical knowledge forms concepts that synthesize specific cultural experience. The quality of philosophical knowledge is determined both by the quality of understanding of philosophers themselves and by the creativity of representatives of all areas of scientific knowledge. It is practically possible, but logically impossible, to be an outside observer of the formation of the modern worldview, in which scientific generalizations serve as nodal formations.

Consistency and diversity in understanding quality are equally important. From the recognition of the need for a creative Union of philosophy and science to the embodiment of this principle of the development of knowledge in real creativity – the road is not easy. The common is hidden in particular. It is necessary to get it, which in itself is not easy, and also not everywhere necessary. In the interaction of theory and practice dominates the authority of the latter.

Practice hurries with the solution of the problems. The "fruitful" side of theoretical knowledge displaces the "light-bearing" side. Science is subordinate to practice, work "from wheels", squeezing the possibilities of the finished theory. Fundamental developments are frozen, but only through them a leap to new materials, technologies, in a word, a new qualitative state of production and goods is achieved.

Not only in theory, but also in practice, there is a need for a synthetic concept of quality, combining the philosophical characteristics of quality with scientific developments and analytical experience of production. We need an ideology of quality.

The ideology of quality is a scientific and philosophical theory of quality with two main objectives. First of all, it should not reflect analytically the real experience of creative human activity, systematized understanding of quality as a product of creativity. And, of course, the ideology of quality is designed to be not only a mirror of socio-historical achievements, it must generate new ideas, guide progress, starting with production, control, regulate, anticipate the relationship of supply and demand in the market across its spectrum.

Analysts note a steady trend of increasing market demand for quality products. There is a significant shift in the sense of specificity of time in the direction of consumer interest in the quality of the goods. However, it became a revelation only because there is not enough theoretical support for the marketing forecast. Mathematical models – "improvised" means. They are effective when sufficient experience has already been accumulated to qualitatively measure the identified changes in the market, that is, to follow rather than to be ahead. A logical advance is necessary, such as in genetics - there is a combination of chromosomes - wait for the corresponding signs with the probability calculated by the known formulas.

The trend of the market to the quality of goods is quite visibly made in the USA right after 1945. Americans at Home, in Europe and Asia rushed to buy more or less valuable. Their interest in quality was due to the purchasing power, on the one hand, and the

analysis of the international situation – the political pendulum swung in the direction of tension between the winners – on the other.

Ideologues entail orientation to national peculiarities and national traditions, national ideas, the uniqueness of the natural environment and relationship with nature, the specifics craft and production development, social architectonics of society, manners, customs.

The theoretical and methodological significance of the ideology of quality is enhanced by the fact that it will help to overcome the limitations of the current attempts to "curb" quality. The so-called quality management systems are actually just forms of organization of quality control or its result. Even the widely used system in the form of the international quality standard ISO-9000 series contains only the most General provisions on quality management [8].

The methodological basis of the ideology of quality is dialectics in both its epistemological meanings – as a General theory and logic of knowledge. You should start from the beginning, not succumbing to psychological discomfort. The logical beginning of the theory was and will be the search for an adequate definition of the system-forming concept. In life concepts, like person, developing the concept, there are two period "donatary" and "postnatal". The active life of the concept begins from the moment of its adequate definition.

Definition – the ultimate abstraction of scientific and philosophical knowledge, grasping the most essential in the content of the concept. It is very poor in content, it seems formal, "non-working" knowledge. However, the definition has a particularly heavy load, systematically describes the concept.

The definition contains an indication of the belonging of the phenomenon reflected in the concept to the system series and at the same time its distinctive features ("defining moments") are fixed. The defining moments of existence include all that constitutes its specific existence. If all the defining points are collected together, the existence of the modus possible of existence enters the valid modus of being. An example is the definition of known geometric shapes: trapezoid, parallelogram, rhombus, rectangle and square. All these figures have 4 corners and are formed by 4 straight lines. They are closed quadrilaterals, that is, the system of closed polygons includes in this quality and are determined through common features. The hierarchy of its own definitions is due to the inclusion of additional (to the necessary) features that specify the content of the defined concept. At the top is a square, as it forms the largest number of additional features. The definition of the square appears to be the most rich in content, but it is not identical with the content of the concept "square", because it was not captured all the geometric properties of a square and its relationship with other figures.

Differences in the understanding of quality begin when from the content of the concept, which always represents some integrity, are withdrawn and inadequately interpreted individual forming features or conditions for the existence of quality. Quality is most often identified with the property, and the conditions are included in the quality system itself. To avoid confusion, it is necessary to clearly adhere to the definition of quality as a reference point in the system of its understanding.

One-sidedness and errors in understanding the quality of the phenomenon have both objective and subjective grounds. Quality, as an objective characteristic of the phenomenon, connects several of its fundamental properties, but the quality of the phenomenon is manifested depending on the relationship with other phenomena in different ways, which allows us to talk about multi-quality. F. Engels wrote: "There are not qualities, but only things that have qualities, and moreover infinitely many qualities." Different expression of quality in the process of interaction of the phenomenon can be perceived unilaterally. That is why the dialectical method of cognition requires that the phenomenon be considered in all possible diversity of its connections. Only compliance with this rule will help to minimize the one-sidedness of the assessment.

The logic of the process of understanding quality as "features" to inadequate judgments. At the initial stage of cognition, the object of research acts as its individual properties. Knowledge moves from individual properties, through their comparison, evaluation, differentiation to the establishment of their relations, the awareness of the unity of these relations. And only at the stage of systematization is formed the desired concept.

Knowledge goes back from "properties" to their unity – "quality", from "quality" to "quantity" and then to the idea of "quantity of quality" or "quantity" – "measure", expressing the relationship of "quality" and "quantity".

The concept of "quality" actively migrated from the system of philosophical categories to science and practical consciousness. Adaptation to new levels of thinking is presented in the Academic dictionary of the Russian language. Along with the philosophical definition, the authors cite three more: [11-12]

1. "An essential feature, a property that distinguishes one object or one person from another (more often about a positive feature, property)."

2. "The degree of dignity, value, suitability of a thing, action, etc., according to what they should be."

3. "The difference in value between a heavy piece and an easy piece in a chess game."

V. I. Dahl also preferred the broadest interpretation of quality – "property or belonging, all that is the essence of a person or thing."

Thus, the quality, which has become, according to experts, the system-forming factor of the modern

economy, involves several aspects of analysis: philosophical, scientific and practical. By balancing these approaches, we can count on success in developing a quality management system.

It is necessary to answer, first of all, clearly and clearly the questions: what do we call "quality"? and what is the peculiarity of the "quality of activity"? The latter is particularly relevant, because we have a specific task to build a quality management system in relation to certain activities – higher professional education.

We formulate the main provisions clarifying the previous characteristic of the concept of "quality": first, quality is a system of defining properties of phenomena. Quality cannot be identified with one of them, no matter how significant it is. Quality can manifest itself through a single property, but even in this case it acts as a certain unity, which is not allowed to be neglected.

Secondly, "quality" and "quantity" are dialectically opposite concepts, that is, they exclude each other, by definition, assuming an interdependent existence. "Quantity" cannot go directly into "quality", it creates a condition that ensures the transformation of one quality (or qualitative state) into another. The same as "quality" goes to "number" but a new quality leads to a different number. Hence the desire to reveal the quality through quantitative analysis. "The reduction of quality to quantity is the main trend of modern natural science." Quantitative quality analysis is rational within the framework of understanding that it does not detect a quality system. The quantitative approach to quality is limited by the operator's function. Understanding "quality" requires a combination of quantitative measurements and qualitative definitions.

Third, the concept of "quality", reflecting the subject-diverse world, should reproduce this objectively existing difference. It is therefore structured. The structuring of "quality" is particularly important for the development of a quality management system. It is advisable to allocate the following structural levels of quality:

quality of natural material;
quality of recycled natural material;
the quality of technical product;
the quality of the software product;
quality of operation.

Comparing the presented levels in the quality structure, it is not difficult to notice that their main difference is due to the presence or degree of inclusion of conscious activity. With the increasing participation of activity, there is a shift in the status of quality from "materiality" (objectivity) to "ideality" (consciousness). Obvious increasing trend of the transition from the naturally formed (natural) properties of quality consciously-specified quality characteristics. The highest embodiment of this shift is achieved at the level of quality of the activity itself. At the same time, we pay attention to the fact that quality at all levels remains an objective characteristic of the process (phenomenon), therefore, to set quality properties arbitrarily unproductive. It is necessary to take into account the objective reality, part of which is our conscious activity. The power of knowledge lies in its objectivity. Quality is provided only by activities that are of high quality, that is, based on the skillful use of objective knowledge. This activity is usually defined as "professional".[]13-14

The most important scientific conclusions of the XX century about the "noosphere", "the transformation of science and culture into the direct productive force of society" and "the increasing role in the history of the subjective factor" reflect the spectral shift in the quality structure in the direction of the quality of activity, actualizing the complex problems of quality management.

The system-forming feature of professional and educational activity is synthetically represented by the concept of "education". The concept of "professional" serves as a vector. "Education, the process and the result of the assimilation of systematic knowledge, skills ... it is closely related to education." Education combines learning and education. Education and upbringing, in principle, are linked by themselves. Education gives their relationship a certain integrity and direction. Education is meaningless to interpret outside ideology. It is not education that should be "cleared" of ideology. In ideology it is necessary to "rake" the blockages arranged by apologists and critics of the bourgeois system of social relations.

The ideology of education – General and professional – is based on two important provisions: the need for systematic training, so that the power of knowledge has a positive vector, and the importance of education needs for systemic knowledge, otherwise the active phase of the relationship to knowledge will be limited by the time of training in educational structures.

The quality criteria of higher professional education should be considered in theoretical and practical aspects. Ideally, both aspects should be two sides of a single action.

In theoretical terms, the quality criteria of the University look like a "docking station" of the state standard; personal satisfaction of the graduate; market requirements of the domestic consumer and multi-level requirements of the international labor market. To combine these various approaches is possible only in the form of the highly elastic and conditional model-specific "expert."

The practical plan is clearer. Modern effective pedagogical technologies, highly qualified personnel, rational management and sufficient finances are necessary.

Instead of conclusions, we will reduce and define the basic concepts of the ideology of quality. The development of the ideology of quality begins with the

identification and determination of the essential properties of the set of phenomena, the quality of which we must understand and evaluate.

The concept of "essential properties" reflects a group of features that characterize the structural and functional features of a given series of phenomena. Essential properties ensure the status and functioning of both individual phenomena and the set as a whole. The absence of at least one such property indicates a lack of qualitative certainty of the phenomenon.

The difficulty lies in determining the materiality of the property. Any standards designed to bring clarity, conditional and subjective, which allows you to manipulate the quality as a characteristic of the phenomenon, to replace the quality. With regard to the quality of the product of the activity and the activity itself, such manipulation is mainly related to the sequestration of the nomenclature of essential properties. For example, shoes should provide safety and comfort of movement. Aesthetic and hygienic composite qualities are Packed in the definition of basic functions, which is quite acceptable, since the definition of quality characteristics requires maximum brevity. The same, that is synthesized included in the definition of quality, you can try to dispose of arbitrarily. It is no secret that in the production of shoes legally and especially illegally on a large scale used materials certified as environmentally friendly at all, but not in our case. Shoes incorrect to divide into good and bad. Poor-quality shoes – by definition – not shoes, and surrogate semblance of, forgery. What to do? It is irrational to determine the real situation on formal grounds, and even more so to take into account the actual practical way of life.

For joining of theory and practice useful to distinguish between the ideology of the quality concept of "quality" and "quality". The concept of "quality" emphasizes the systematic way of relationship forming the certainty of the set of phenomena of essential properties. Quality, as the ultimate characteristic of certainty, characterizes this set of phenomena formally, fundamentally.

The concept of "state of quality" reflects a specific level of expression of the quality of phenomena. In this sense, it is more meaningful and captures the real situation. The state of quality can be incomplete, conditionally determined.

The concept of "quality levels" concretizes the understanding of quality in the aspect of the development of the world, its complexity, the increasing importance of reasonable practice. The ideology of quality is applicable just to certain levels of quality, or rather, it is due to their specific status and internal differentiation.

The historical development of the main types of footwear took place in direct connection with the natural socio-economic conditions of its era, the aesthetic and moral requirements of social life and the dominant artistic style in art.

Style in art is a historically formed, relatively stable community of the figurative system of means and methods of artistic expression, conditioned by the unity of the ideological content.

In the costume, the overall style orientation is expressed in the main forms and proportions, the way of wearing, the use of certain materials and their color combinations, the nature of the use of auxiliary materials, accessories and jewelry.

Changes in the General artistic style of the era are always associated with great ideological and social changes. They occur over a long historical period. But within each style there is a more mobile and short-term phenomenon – fashion, affecting all areas of human activity.

The word "fashion" comes from the French mode, which in turn goes back to the Latin modus, which means measure, image, way.

According to V. dal, fashion is a temporary changeable whim in everyday life, in society, in the cut of clothes and outfits. Often there is another definition: fashion is a short-term domination of certain forms, associated with the constant need for human diversity and novelty of the surrounding activities. Especially noticeable and actively manifested fashion in the suit, which is subject to the most frequent changeability of volume, planar and linear forms.

Some experts, trendsetters, believe that the birth of fashion is difficult to associate with any particular period or event. Perhaps it is as uncertain as its end. But, on the other hand, the most important feature of fashion is its mandatory changeability. With the emergence of new fashion shoes, and other items of costume, typical for the earlier fashion, to partially or substantially lose their aesthetic value, along with the monetary value. This fact is of great aesthetic and economic importance for producers and buyers. Some do not want to buy, and others untimely felt a sharp drop in demand for these types of shoes, were not able to offer the market new fashionable types of shoes in time to maintain a high demand and the image of his company as a trendsetter, having a marketing service that monitors the issues of demand and timely make an effective decision. Unfortunately, manufacturers will not understand that this fact – the loss of aesthetic value of the types of shoes offered to the buyer – comes from the natural desire of people to update their wardrobe, which is associated with the ever-changing needs (including aesthetic) and the overall development of human society.[15-16]

The work of the enterprise without taking into account the current situation in the market of demand today, or better – tomorrow, will necessarily lead to the collapse, because fashion is both novelty and imitation is not always new, but necessarily unusual with the manifestation of the individuality of each consumer. It is impossible not to agree with the statement of the famous French fashion designer P.

Cardin about fashion: "Fashion is ... an update! The principle that should be eternally nature! The tree sheds old leaves, the man – bored clothes and shoes. When things become familiar, people get tired of them quickly. Fashion saves you from the tedious uniformity. People want to like each other: to be beautifully dressed, to look good is a natural need."

The modern leader needs to have that flair, the ability to foresee this emerging new thing that is already in the air, but has not yet found flesh. This ability is necessary to learn, to risk, to surround yourself with talented fashion designers, to trust them, implementing their proposals and development in small batches, testing the market demand, advertising the advantages of the proposed range of shoes, forming the buyer's good taste and his desire to be beautifully dressed, look good. It doesn't happen by itself. This state of mind is formed under the influence of the environment where a person communicates, lives, creates and wants to be recognized.

Taste should be developed, but at the same time every buyer, every member of society who considers himself a cultured person, taste should be endowed with individual qualities, only in this case fashion will be able to fulfill its mission – to make each person an individual. This is possible if people have different personal tastes, if a society of people is created that is able to respect other people's tastes, without imposing their own, peacefully coexisting, forming a society of intellectual, cultural people.

Unfortunately, the level of quality in the Russian industry and service sector still does not meet these requirements. Few examples of successful competition of Russian companies in the foreign market in most cases are achieved due to the low cost of raw materials, energy and labor. After Russia's accession to the WTO, Russian companies will not have these advantages. They will be able to compete with global manufacturers, based only on the high quality of products and processes, the ability to meet the requirements of the market, the presence of a popular range of shoes.

One of the most important steps in the implementation of these goals was the adoption of the Federal law №184-FZ "On technical regulation" on December 27, 2002. This law lays the foundations for a radical reform of the entire system of state regulation of quality.

The Federal law "On technical regulation" (hereinafter-FZ) provides for harmonization with the European practice of Russian: approach to conformity assessment, standardization system, state quality control. The country's technical regulation reform is aimed at ensuring that the market achieves the necessary balance between the interests of the consumer and the manufacturer. At the same time, on the one hand, the safety of products for humans, their property, and the environment must be ensured, and on the other – on the way of goods to the market (assessment and confirmation of compliance, quality control and supervision, etc.) allows to prevent actions that mislead consumers.

It is known that the leading position in the world economy is achieved only by those countries that are able to provide quality products and services that create competitive advantages for their producers and comfortable living conditions for consumers. That is why in the leading countries of the world the problem of quality is in the center of economic interests of the state and citizens. Quality systems, as a market mechanism for quality management, which enterprises use at their discretion, require state support.

One of the important steps of state support of quality systems was the release in 1998 of the decree of the government of the Russian Federation "On some measures aimed at improving the quality of products and services." It reads: "Considered the most important task of the Federal bodies of Executive power, the implementation of support of subjects of economic activities, implementing quality system based on the GOST R ISO 9000 to improve the competitiveness of products and services. Recommend to Executive authorities of subjects of the Russian Federation to support the specified subjects of economic activity".

As a result, through the placement of profitable orders, the state is interested in the industry in the creation and use of effective tools to improve product quality, such as modern quality systems, that is, to use a new version of ISO 9000:.

The quality system according to the new version of ISO 9000 standards – is to provide the necessary quality to the consumer, but with minimal cost. This, in particular, is the philosophy of the concept of TQM (Total Quality Management) and as a result – the high efficiency of the quality system in the enterprise [10, 11]. In these conditions, the company that can offer consumers the best quality at a lower price will get the advantage.

The quality system should provide both compliance of products with the requirements of the consumer, and guaranteed identification and elimination of shortcomings of production processes that affect the quality, i.e. to ensure the greatest probability of no defects.

But it has been more than a year since the entry into force of the Federal law, during this time the country has not adopted any technical regulations establishing mandatory for the application and execution of requirements for objects of technical regulation.

Technical regulation – legal regulation of relations in the field of establishment, application and execution of mandatory requirements for products, processes of production, operation, storage, transportation, sale and disposal, performance of

works or provision of services and legal regulation of relations in the field of conformity assessment [4, 5].

According to Deputy Director of the Department of technical regulation and Metrology of the Ministry of industry and energy of Russia (former state standard) Yevgeny Petrosyan, this situation with the execution of the Federal law is due to the confusion in the field of standardization after the failure of the administrative reform. In fact, Marina Glazatova, Director of the Department, agrees that the failed administrative reform delayed the reform of standardization, because only a year later the Russian Government will formulate the main tasks for them, but today it is necessary to solve three main problems, namely::

clarify the provisions concerning the mandatory confirmation of conformity during the transition period. Here it is necessary to amend article 46 of the Federal law. This amendment should guarantee the mandatory implementation of all forms of conformity assessment that exist today, and would establish the legitimacy of both certificates and declarations for the transition period. At present, there is no such document, as the laws on certification and standardization have been abolished;

clarify the provisions for the registration of certificates and declarations of conformity. According to the Federal law, registration should be carried out by the Federal body for technical regulation, that is, the Ministry. However, physically it will not be able to cope with such a volume of work, so this problem was solved by preserving the right of registration in the field for the centers of standardization and Metrology. However, the fate of the CSM As Federal state institutions is not yet clear;

clarify the procedure for the development of rules and methods of testing and measurement, sampling. In accordance with the Federal law, all methods must be approved by the government. But given the fact that the standards – six and a half thousand, it seems unrealistic. The Department proposes to transfer this work to the level of approval of national standards, that is, to the level of the Federal Agency. But the question remains open, because the Federal law provides that the rules and methods to be approved by the government will then be used for control and supervision during inspections. That is, the parties will know in advance how exactly, by what method the verification will be conducted. This will make the process of monitoring compliance with technical regulations more transparent.

Only the meaning of these claims is rather the opposite: if "private" projects sin incomplete and extremely easy to put forward to the product requirements, the "state" seek to regulate everything that is possible, and by such high standards that it is not clear who will be able to fulfill them. Although technical regulations are adopted only to ensure the protection of life or health of citizens; property of individuals or legal entities, state or municipal property; environmental protection, prevention of actions misleading purchasers. Application of technical regulations for other purposes is not allowed.

Since according to the Federal law technical regulations are divided into General and special, in this case, the requirements of General technical regulations are mandatory for all types of products, production processes, operation, etc. They are adopted on the issues of safe operation and utilization of machinery and equipment, safe operation of buildings, structures, buildings and adjacent territories, fire, environmental, biological, nuclear and radiation safety, electromagnetic compatibility, while special technical regulations establish requirements for certain types of products, production processes, operation, etc.

The Federal law provides for two types of standards to meet the requirements of technical regulations: national standards, which are adopted and approved by the national standardization body, and standards of enterprises (organizations). The existing industry standards will no longer exist, they should be transferred to the rank of national standards or to the standards of organizations.

Therefore, a standard is a document that, for the purpose of voluntary reuse, establishes the characteristics of products, the rules for the implementation and characteristics of the processes of production, operation, storage, transportation, sale and disposal, performance of work or provision of services. The standard may also contain requirements for terminology, symbols, labeling or labels and rules for their application.

During reforms at the enterprises after adoption of Federal law services of standardization, Metrology, quality control as unnecessary, superfluous were sharply reduced, and at the enterprises where life hardly glowed, for the sake of economy of Fund of a salary of service of standardization, Metrology and quality control in General were liquidated. Heads of some quite successful enterprises, oddly enough, for a long time did not come to mind the idea that quality is a fundamental factor in the competition, and these services are just those knights who are able to ensure this very success in the market.

Technical regulations do not set requirements for design and performance. As a result, manufacturers will always have a task in the manufacture of specific products to have a document for the production of products that would provide, along with the creation of products with specified consumer properties, the requirements of technical regulations. There are two ways to act in this situation: the first is to develop such a document independently, which is not every manufacturer can do, the second is to apply a national standard. The first method is fraught with the fact that the manufacturer will have to prove that its document

ensures compliance with the requirements of technical regulations. Thus, the main condition for fulfilling the requirements of the technical regulations can be the implementation of the principle of "presumption of conformity" adopted in the EU. In Russian conditions, this means that the use of manufacturers on a voluntary basis of national standards harmonized with this technical regulation (p. 9.16) is considered to be the fulfillment of its requirements.

The developers of the new version of the ISO 9000 series of standards have made an attempt to invest in them a modern understanding of the quality system that meets the requirements of the global market, which can be described as follows:[17-18]

the market is over saturated with goods of the same purpose;

it is characterized by constant variability due to scientific and technological progress, as well as fierce competition, generating new proposals;

consumers in the market know what they want and have plenty to choose from.

Another principle: to build a quality system adopted a "process approach". Accordingly, it is represented by three interrelated blocks of processes instead of the 20 elements provided for in the previous version of the standards: this is the management of resources, product life cycle, as well as changes and improvements. In accordance with ISO 9000: standards, a process is an activity aimed at achieving an established goal, which has a quantitative expression – the result. Therefore, in order to implement the "process approach", the organizational system of enterprises should be reoriented from functional management to results management, the totality of which should improve the efficiency and competitiveness of the enterprise.

Therefore, from an economic perspective, the application of the "process approach" concept should contribute to the improvement of economic performance.

Already today, if not yesterday, every Manager needs to reconsider his attitude to what is happening in his enterprise to ensure the competitiveness and demand for products manufactured at his enterprise.

Especially topical is this formulation of the problem for Shoe companies, because the markets of Russia have been and will be over saturated with types of shoes of the same purpose. Therefore, it is necessary to know exactly what will be in demand in the market and, as it should be, implemented, so that it is your range of shoes was chosen by the buyer, withstanding the fierce competition that generates new proposals.

For all this, it is important to build an assortment policy so that the market, if the shoes of the same type arrive, it should be significantly different in price, but meet the requirements of the standard.

In addition, both the head of the enterprise and the fashion designer should proceed from the fact that each fashion corresponds to a certain time when choosing the assortment policy, but it has a certain repeatability with an appropriate adjustment taking into account a different, modern era.

For example, the same types of shoes can be:

immoral – 10 years before his time;

defiant – 3 years before its time;

daring – 1 year before its time;

beautiful – when these types of shoes in fashion;

tasteless – a year after his time;

ugly – 10 years after their time;

funny – in 20 years;

funny – in 30 years;

peculiar – in 50 years;

pleasant – in 70 years;

romantic – 150 years after their time.

Jean Cocteau has a catch phrase: "Take fashion seriously, because it dies so young ..." (Fig. 4).

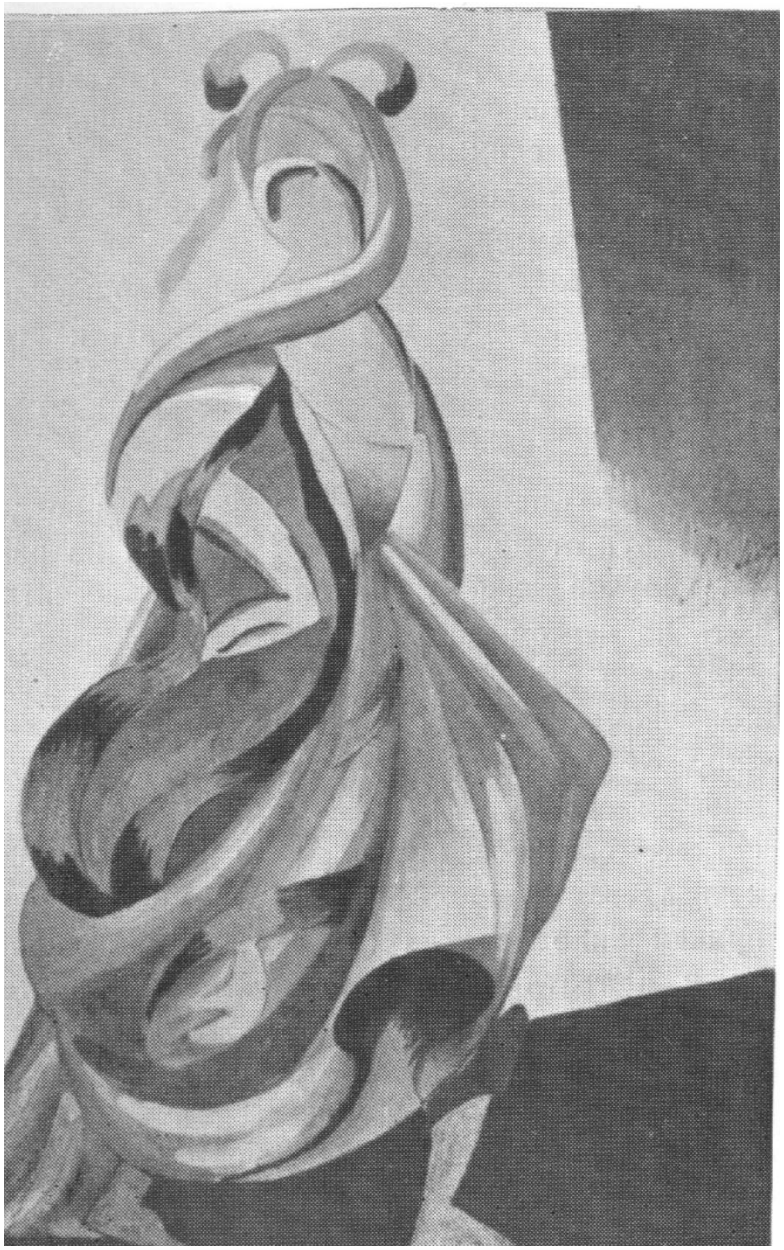

Fig.4– Alexander Exter. Shakespeare's heroine in a suit

But at the same time we have to reckon with the fact that we can not insist on the found, to get involved in replication, even when as good as the model did not "go" today. Nothing but the painful blockage of yesterday's fashionable shoes, we will not achieve this. And every time we will face the problem of its implementation, and it is very difficult when it comes to thousands of copies. In fashion more than in any other area, it is necessary to be able to say goodbye to the discovery, even successful, for the sake of novelty. And, interestingly enough, it is possible to bring to market in the second round, and sometimes for human life and third, the shoes are great-grandmothers, they "look", they are able to live, but it's impossible in relation to fashion yesterday and it is confirmed by the whole history of Shoe production, as in fashion – last night, unbearable the day before yesterday, the day before yesterday also – possible. Here comes into force the mechanism embedded in our cultural consciousness: memory revives a long-standing, it becomes sweet and is included in the modern footwear of special note, creating a sort of support in the stream of changing experiences. This will be possible in the event that enterprises can quickly change, create a new pace of the cycle of finished shoes, create an extensive and highly effective sales network with the mandatory diversity of the range of shoes manufactured by "small series".

It is thought, it is clear that there can't be ready recipes for all occasions, but there has to be a constant work, the daily solution of the arising problems on production and realization of demanded footwear.

It's like breathing. It is impossible to draw air and to freeze; the smooth, constant, adjusted rhythm of inhalation and exhalation is Life.

For rice. 3-6 are models of men's and women's shoes. In developing them, we wanted to focus the manufacturers ' attention on the possibility of using basic models for a significant expansion of the range, ensuring demand for it and creating the basis for a sustainable assortment policy throughout the calendar year.

Wherever the shoes produced by the enterprise are sold: in a company store, at wholesale fairs or Federal exhibitions – it is always important to know the niche that is not occupied today and urgently fill it. This is possible only if the buyer is not limited to the choice to make a decision about its purchase, if the interests and capabilities of all consumer groups are taken into account. These are not beautiful words, but the reality of today's market. Without such marketing research, without strict consideration of demand, without analyzing the reasons for the return of shoes by buyers and analyzing their claims, it is difficult to expect success, and this is simply impossible.

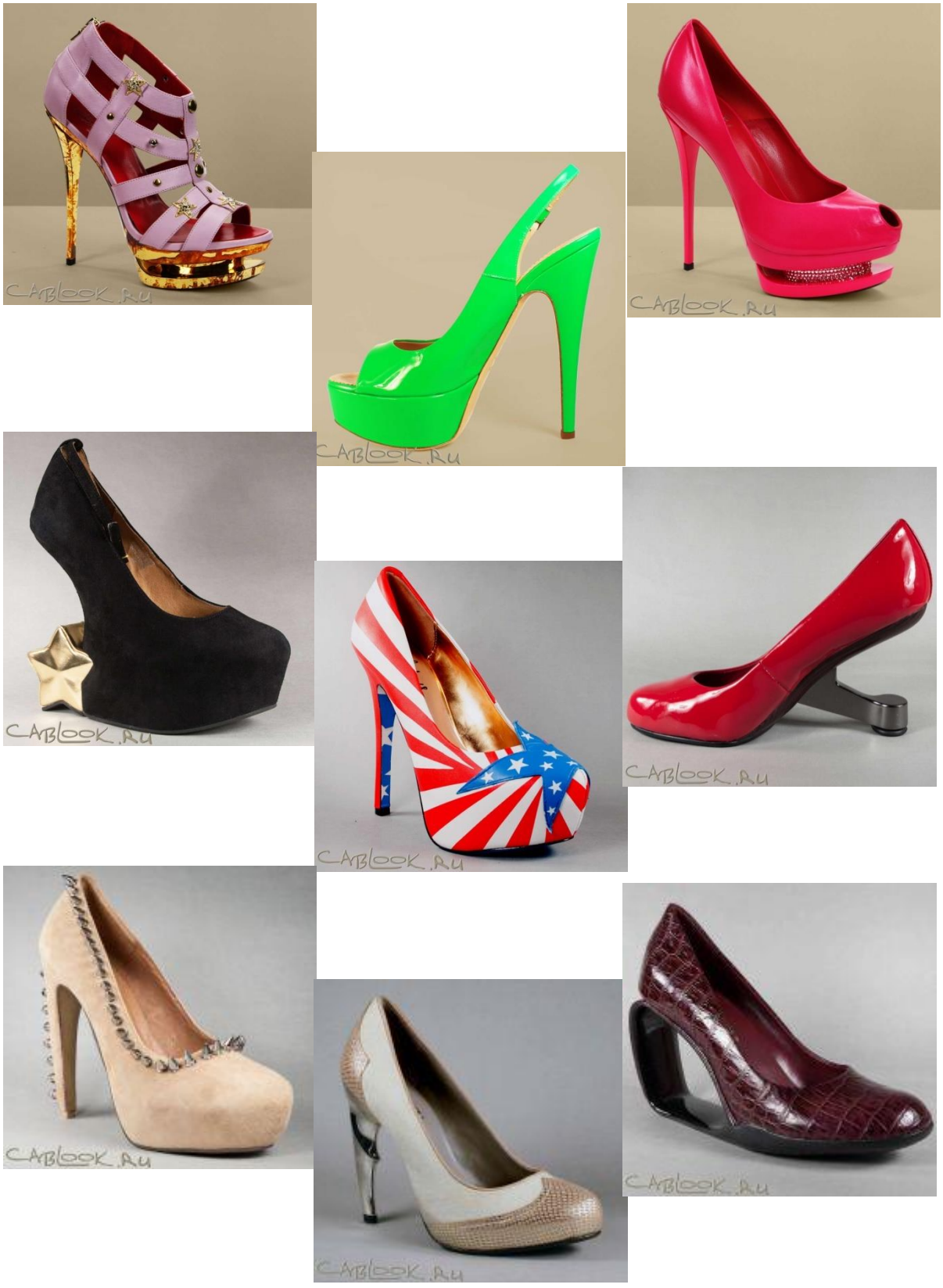

Fig. 5 Range of women's shoes

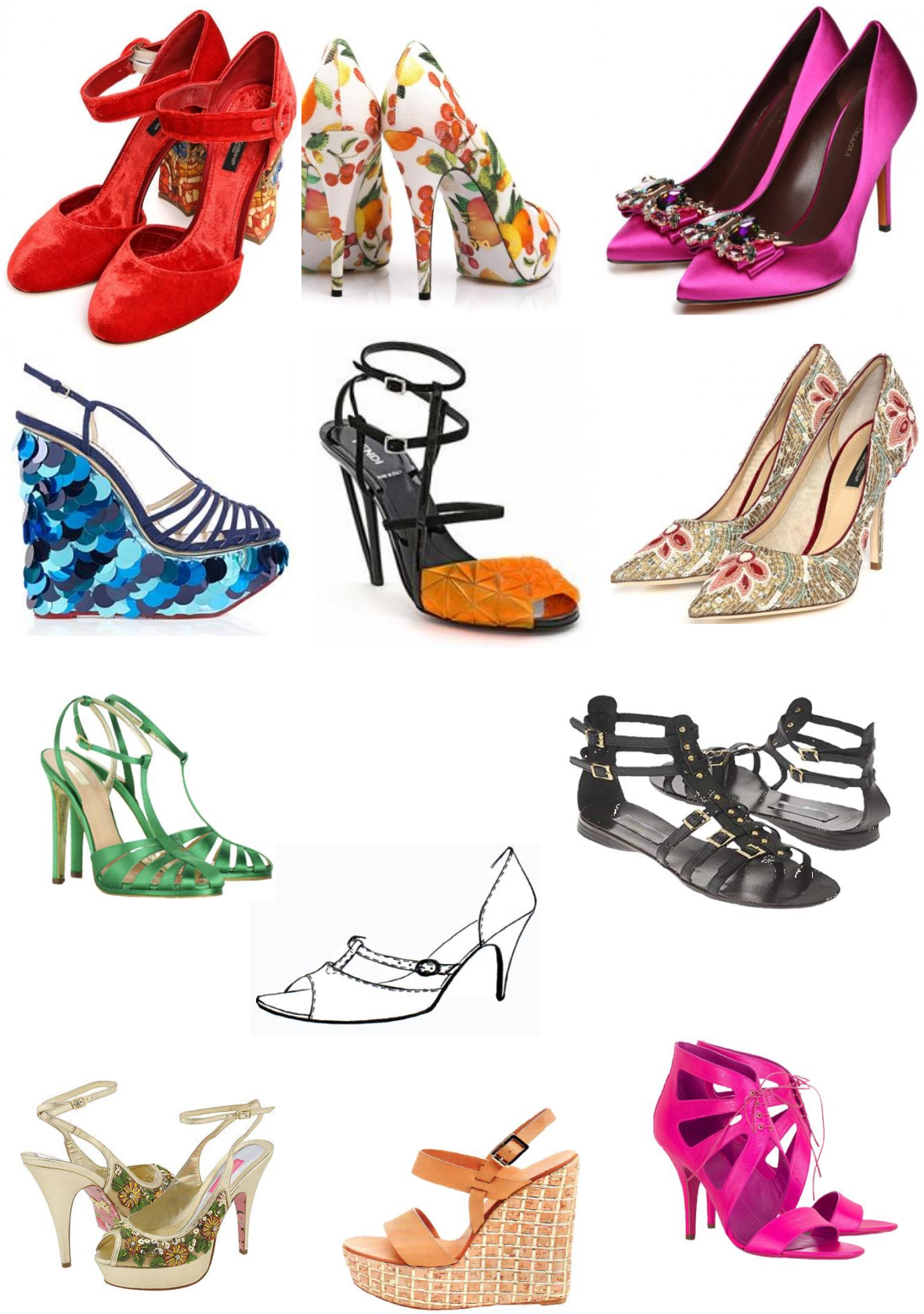

Fig. 6 (Range of elite and summer women's shoes)

Fig. 7 Range of women's boots

Fig. 8. (Elite range of women's boots)

Fig 9. Assortment of women's demi-season and winter shoes

**Fig. 10. (Range of women's shoes:
a) for outdoor activities; b) office shoes)**

Fig. 11 Assortment of men's shoes

Fig. 12. (The range of men's office shoes)

Fig. 13. (The range of autumn and spring men's shoes)

Fig. 14. (The range of summer men's shoes and shoes for outdoor activities)

Fig. 15. Assortment of men's winter shoes

The more offered to trade a variety of shoes on the same basic basis, the more it will be implemented, the easier it is for the company to ensure timely modernization of its production and in time to replace the out-of-fashion, not in demand shoes on the one that will be in demand again. In General need to the issues, to be "swim"[19-20].

For men's and women's shoes are characterized by the same requirements to create conditions for its demand, but taking into account the market where the shoes will be offered for sale. Men's shoes are in high demand today, due to the change in the status of the southern Federal district (southern Federal district) on the Russian geopolus. The border district, internal troops, military units of the Ministry of emergency situations, regular military units and formations, a huge flow of refugees, a large number of higher educational institutions – all this provokes the need for a large number of consumer goods, including shoes for different purposes. In this regard, the demand for men's shoes has its own characteristics, consisting in the fact that the market is the most popular autumn-spring assortment of shoes. And the presence of the manufacture of footwear for military personnel and adhesive injection methods extends the capability of the Shoe companies in the design and manufacture of men shoes on the joint of casual and special opportunities small changes in the technology of it to the consumer or to invite military representatives as footwear. Such a wide range has already provoked the opening of numerous small enterprises for the production of men's shoes. I just wanted to draw the attention of business leaders and fashion designers on the principles of the formation of the range of men's shoes to ensure sustainable demand and high competitiveness in the supply market.

It is important that the experimental group of the enterprise in due time monitored in the market of offers emergence of new materials and accessories, ensuring the right to know-how, feature, originality, thereby, creating image to the enterprise, respect for "brand" of the enterprise and the trademark that in all cases this prestige was always supported at very high level.

For example, if you use a molded sole with a rim, its fastening will always be carried out using a combined method of fastening – thread and glue, as it is high quality and ensures its durability, then the buyer will already know that the shoes of this company differs from others in high quality, reliability, availability and comfort.

A special place is occupied by the production of women's shoes for the market demand of SFD and skfo. A large volume of imported shoes, affordable prices make the production of women's shoes less profitable business in comparison with children's and men's shoes. Again, attention is drawn to the fact that the importance of marketing research is increasing, the definition of its range, which will never be taken into account by "shuttles" and foreign firms. Therefore, the analysis of anthropometric changes that have occurred in the feet of the female part of the population of the southern Federal district in recent years, the presence of a large number of buyers with pathological deviations, significant differences in full size allow manufacturers to produce women's shoes on the styles of such pads, which are more satisfying customers in a comfortable and comfortable shoes, and traditional high quality and reliability against the background of lower cost make such shoes always popular and desirable. And footwear for the elderly, socially not protected, but having even greater pathological changes of feet allow producers together with designers taking into account these features to make footwear which will always be demanded and realized. In addition, we need new solutions, unexpected offers and then You, the producers, will succeed not only in the domestic market, but also become more accessible foreign markets. [21-22]

Thus, even today, despite the lack of a legal framework for technical regulation, it is necessary for each head to choose his own, and only his own rules of the game and behavior in the market of supply of shoes of domestic producers, not forgetting to use the opportunity to export their products to the world market, especially on the eve of Russia's accession to the WTO.

The modern economy is increasingly called "smart", "prudent", innovative. This is a more understandable definition in comparison with the "post-industrial", but how it adequately characterizes its state is not an idle question. Character manifests itself in development, determines the planning of economic policy. The recent crisis clearly shows, first, that planning is not just compatible with a market mode of management, it is necessary to anticipate and mitigate any negative impacts that are born of unchallenged economic freedom, bordering on arbitrariness. Secondly, the ongoing crisis has revealed the limitations of the desire to present the built economy as "smart", but it is impossible to build it with only one mind.

The Central figure of commodity production is not Finance, as many politicians, including domestic ones, believe. Money is the equivalent of a commodity and will always be. The commodity creates labor, which in turn is also a commodity. Consequently, the movement of production is rooted in the aggregate expression of human activity, first of all, the work of consciousness, its potential.

Mind is not equivalent to consciousness. The mind – tool of the construction of consciousness. "Smart consciousness – knowing, cunning, mobile – but no more. The mind needs, like any force, a vector to guide the application of the mind, the construction of consciousness. The role of the vector is played by values: professional, national, universal. The mind fuses them into a unique personal expression. "Smart"

economy – no, if you do not put it on the Foundation of value.

The main thing in the personality – the decisive factor of social reproduction – is its morality. Not everyone is given to be top managers, General designers, VIP persons in politics. Someone needs to work with brains, some with our hands. The trouble comes when the "brains" and "hands" become sticky and stick to them that is not necessary. Immorality undermines the foundations of professional culture and professional activity of the creative force is transformed into its opposite – destroys created. A smart economy can be a terrible reality if it continues to be immoral. We are not utopians or idealists, we understand the specific historical position of morality. Now it is not about equality and brotherhood – only about conscience and responsibility.

Cyclical, economic crises will grow unnatural – systemic. The system-forming factor of the latter is the dishonesty and irresponsibility of the largest producers.

And what should have been done by the state, designed to be a social guarantor in a democratic society and a defender of the rights of citizens. It was forced to "add fuel to the fire" – to subsidize the business that went bankrupt on scams in order to avoid economic and social collapse. However, European leaders at the same time sent to the "sources of fire" "firefighters" – put the further work of the defrauded firms dependent on moral principles – introduced moral and financial regulations designed to sober lost all measure of businessmen. Symptomatic: France and Germany – the initiators of strict moral and financial monitoring – were the first to feel signs of economic recovery. England and the United States, hit by more corruption and less prone to moral dictatorship, continue to reap the fruits of freedom from conscience and social responsibility of their magnates.

Russia, as might be expected, has missed a real opportunity to use the crisis to boost national industry. First poured Finance into the banks, then very vague actions taken to awaken the conscience and responsibility of bankers. There was a chance at the expense of national funds to force banks to be the financial lever of rise of industrial production, science, technical creativity in the country. As a result, the currency earned on the world market has flowed back and it is necessary to "start from the beginning".

History does not return, but it is not a reason to forget history. Whatever the continuation of the story is, it is its continuation. Having refused national traditions, it is possible to appear at "the broken trough". Not only the Second world war is falsified, scientific, technical and industrial achievements of the country are distorted and hushed up. Faith in national forces and the ability of the people to regain lost positions are being undermined.

The current situation is very complicated, however, it is not more critical than the turning points of Russian history, which seemed hopeless devastation after the civil war, the loss of the most developed areas in the first years of the great Patriotic war, aggravated by the enormous casualties among the working-age population, professionals.

Then there was no Finance available as initial capital today. Therefore, the solution to the problem of creating a modern economy rests technically on the need to develop an effective system of management and control over the execution of adopted programs.

The program has replaced the plan. And what came to replace the responsibility for the failure of the plan? The lack of an effective system of control is the most serious defect of the current economic policy, which allows Amateurs to lead, feeling in business. The revival of the economy in the existing conditions of professional irresponsibility is impossible. Only professionalism and the responsibility associated with it for the work you serve are able to make the necessary transition to a new economic quality, to build an economical and mobile economy on the basis of the full development of science, to stimulate technological progress and improve professional training.

The economy of the XXI century can be called in different ways. Not in the name of the essence of the definition – in the content of the concept. The diversification of names shows the versatility of the modern economy. It is methodologically significant to single out the leading link or links in this set. Undoubtedly, among the obvious contenders is the quality of the economy.

The presence of quality in the characteristic of any phenomenon is invariant, since quality combines its most essential features. At the same time, it should be clearly understood that the quality itself is changing – it is historically specific. Accordingly, the idea of quality is changing – it should be changed. From the first attempts of A. Fayol, G. Ford and F. Taylor to put the quality of goods under control, which were crowned with serious success, it became theoretically clear: the future of the quality of the economy for the activity. The determining factor for the economy is not so much the quality of the goods accepted for production, but the quality of organization and management of its quality production. For Handicrafts and small-scale production, the quality of the sample and marketable products are combined with technology, usually unchanged. Here, the quality depends entirely on the mastery of the technique and compliance with the declared technology in a limited scale of production. Often the master, technologist, Manager and marketer are the same person.

Mr. Ford was the first to put the production of a complex product by dividing the operations and responsibility, and, thereby, has identified a twist in the fate of quality. From now on, the fate of quality was determined by "introduced" factors – the organization of production, management and control.

In the foreground was not the skill of the direct manufacturer, and the ability to skillfully organize production, including its expanded reproduction, that is, supply, marketing, personnel management.

Diversion of activities revealed its special position in achieving quality results. The second world war confirmed: personnel and management decide everything!

Since 1950-ies sharply intensifitsiruetsa search program quality management through quality activities. If at the beginning of the twentieth century, the technical regulation of the product and components became relevant, then after half a century there was a qualitative clarification of the value of technical regulation. In the epicenter of interests was already the technical regulation of the organization and management of production, which confirms the modern international system of quality regulation.

The shift of the centre of gravity in the understanding of economic policies aimed at ensuring quality sustainability of production towards technical regulation of activities did not pass without costs and dead-end routes, which in principle was expected. The activity, United by production, is not homogeneous and not Autonomous, so the solution of problems "buried" in the methodological and theoretical "imperfections" of professional thinking.

The concept of "key activities" was first justified by A. Feigenbaum. In 1951 his book "General quality control" was published. ISO 9000 and ISO 14000 were developed on the basis of proposals by A. Feigenbaum. It was assumed that both series of international standards will help to move from "industrial conglomerates" to "business systems" [23-24].

In the process of development of industrial production under the influence of scientific and technological progress, a contradiction in the rate of change of the material side and the evolution of managerial thought concerning the organization and harmonization of the production process was formed and aggravated. The latter clearly did not keep up with the first, slowing progress, increasing risks and costs. The rigidity of Central planning only worsened the situation, which is explained by the stagnation of the 1970s and the decline in the 1980s. The organizational scheme of the "enterprise – conglomerate" did not fit well into the transition to the system organization of the enterprise, primarily because it did not activate the initiative, creativity. It is no accident that "drummers", "innovators", "innovators" in the USSR were mainly engaged in the party, Komsomol, trade Union organizations, which in fact stood outside the direct production and formed an add-on over it.

Simplified organizational chart of the enterprise is as follows (figure). The scheme of construction of management, in which the main production units are functionally Autonomous and connected indirectly through a common Manager, is anti-system. When someone designs something, others have to produce it, others – to control the quality, the fourth – to sell products on the market, separates the participants of production, block the creative Alliance. All are nominal partners in the process and have little idea who is doing what and why. There is no team spirit, everyone acts on his own, at his own risk, often at the expense of colleagues, substituting the latter.

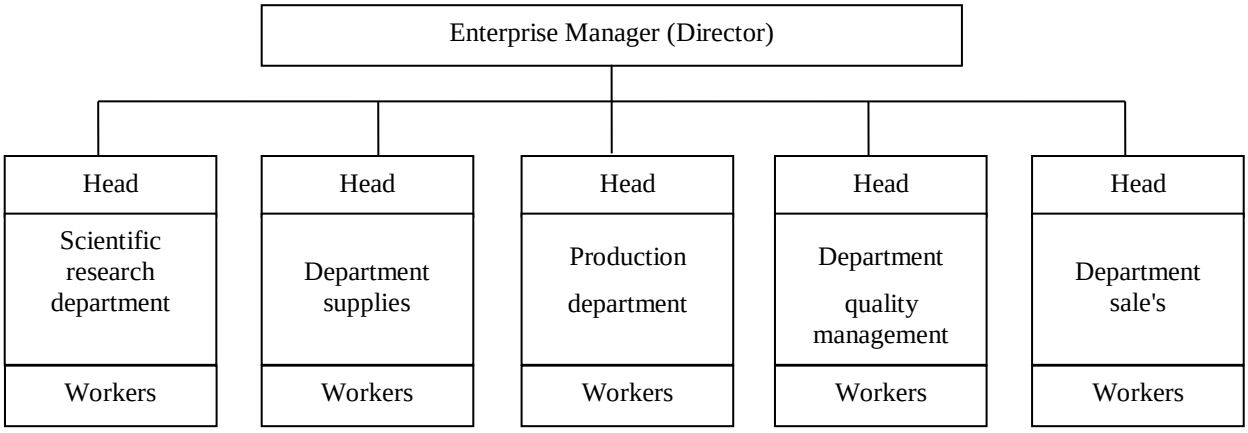

Fig 16. Organizational chart of the enterprise

The fundamental misconception of managers of "conglomerate enterprises" is the belief that their "brains" should be enough for timely recognition and correction of force majeure in the production process.

The management scheme of the "conglomerate enterprise" essentially coincides, despite the presence of a specialized Department with the quality management scheme, because the functions of the quality management Department are mainly reduced to control activities.

In 1924, W. Schuhart proposed to optimize this method of control using the principles of the theory of statistical variation, providing managers with a statistical control map. The improvement of work did

not slow down to affect the results, but it was limited to partial changes for the better. The "philosophy of the theory of variation" instead of using it as a basis for management was relegated to the level of statistical tools used by technicians with limited and very specialized areas of responsibility... Ignorance of the theory of behavior of industrial processes made management unable to correctly recognize situations that require or do not require action. For this reason, management became extremely vulnerable to three types of costly management errors:

the attitude to all variations of the output parameters of the process as a surprise in the behavior and suppression, in fact, the imaginary causes of them, which leads to the destabilization of the process;

the attitude to all variations of the output parameters of the process as natural manifestations and inaction about the detection and suppression of their causes, which leads to unstable behavior;

the assumption that process optimization and stabilization are technical solutions for which a particular Department is fully responsible, rather than an organizational problem requiring the full support of management and the efforts of several departments."

The restructuring of the management system of the organization provides:

interconnection of key activities, so that different departments of enterprises are consistently involved in the coordination of actions, for example, to revise the quality of products, taking into account the specific comments of consumers, improving staff training, promotions, etc.;

integration of other processes in the key activities;

integration of new key activities into existing ones.

A dangerous misconception in the construction of "enterprise - system" management is the interpretation of optimality as the sum of the optimal rearrangements of individual units. In this case, the enterprise is still regarded as a conglomerate, the sum of departments playing their special role. There is no view of activity as integration of all its components.

In European literature, a new term "quality revolution"is increasingly used. We will not argue how adequately it captures the dynamics of policies aimed at improving the quality of production, we note only that the involvement in the study of the concept of "revolution" looks quite natural. The comparison of modern quality management practices with the not so distant past clearly indicates a radical restructuring of the understanding of quality technology. In the "revolution of quality" differentiate four stages:

1960s – the stage of self-determination of the quality of goods as the main factor of market competition;

1970s – a shift from the dominant quality of goods to the quality of technology and production;

1980s – transition from quality technologies and production to quality "quality system" or "quality management system»;

1990s – the ascent to the quality of education, the quality of intellectual resources.

The path of Europeans to the Bologna accords was long and difficult. He exposed many shortcomings and contradictions. In particular:

evidence of the gap between the requirements of the society of industrialized countries to the education system and its capabilities;

the discrepancy between the fact that the most significant discoveries and inventions are made mainly at the intersection of Sciences, and education is based on the division of subjects;

lack of mobility the organization of training of specialists, its growing backlog of accelerating change in technology, technology, science;

inertia in the development of new educational paradigms, programs, methods, the backlog in the development of new textbooks.

Nevertheless, there is also a serious progress – three levels of quality assurance of education are allocated and balanced: high school, national and European.

The intellectualization of the economy, reinforced by the transformation of science into the direct force of production, which the specialists of the XXI century like to talk about, revealed the fundamental contradiction of human consciousness between the mind and decency. Philosophers sought its solution in the rationality of homo sapiens, emphasizing the basic function of morality. Exaggerating the activity of consciousness through the actualization of intellectual abilities, focusing on the creative forces of the mind, reducing consciousness to thinking, supporters of the "smart" economy do not see or do not want to see the dependence of the mind on morality, oppose the role of mind to the value of moral values. We have already noted that the power of knowledge only on a private scale can have its own vector. In systemic terms, the power of knowledge is directed at the root, not the private and corporate interests of the producer. Morality was formed as the first derivative of labor as a way of first survival, then the development of mankind. The main criterion of social progress can not be the efficiency of production – it is a purely economic parameter, the Human being is a social being and the degree of its achievements is determined by how the movement strengthens human relations – first of all – moral.

Economic activity should be wise, when the mind is not focused on itself, but on the aggregate, personal, national and universal interests.

It's time to understand that it is dangerous to hold humanity for the masses of idiots, someone else's "hands" to build corporate happiness. There is no historical perspective without rigid moral regulations

subordinating all other aspects of human existence. The mind is valid only in the form of an operator clearing the path to the economy of the future. If someone likes to call the economy of the future smart, intellectual, it is necessary to explain that by smart refers to a reasonable economy, built not on cunning and private benefits.

The current crisis has shown the vulnerability of democratic relations. Freedom of action, which led to the crisis, opened the amorphous democratic postulates, not intelligent worship of the regulatory abilities of the market, not an adequate perception of the actions of the "powers that be". Innovation in the economy signify a new way of thinking of mankind, alloy intelligence and morality. The innovative economy will be built first by the Chinese and Indians, that is, those peoples who have kept in mind the authority of moral values, subordinating scientific and technical achievements to national interests.

One hundred and fifty years ago, K. Marx wrote, "In our time, everything seems to be fraught with its opposite ...Even the pure light of science cannot apparently Shine otherwise than only on the gloomy background of ignorance. All our discoveries and all our progress seem to lead to the fact that material forces are endowed with intellectual life, and human life, devoid of its intellectual side, is reduced to the degree of simple material force. This antagonism between modern industry and science, on the one hand, modern poverty and decline, on the other, this antagonism between the productive forces and the social relations of our age, is a tangible, inevitable and indisputable fact."

We can not share the Communist conclusion of Marx, but one thing is certain – he is absolutely right in assessing the socio-economic situation of the middle of the x1 CENTURY. It was necessary and remains a restructuring in the public consciousness. Money should not rise above morality, otherwise the main citadel – homo sapiens – his wisdom will be destroyed. The validity of Marx's conclusions is confirmed by the socio-economic situation that has developed today in the footwear industry in Russia.

The liberalization of foreign economic relations played a fatal role in the disaster. On the one hand, the flow of better imported shoes flooded, as a result of which Russian shoes ceased to be in demand. On the other hand, taking advantage of the right to set any prices, our manufacturers have raised them to the level of prices for imported shoes, and the level of quality remains the same. And for this reason, it also stopped buying.

The government would intervene to protect their producers (cheap loans and customs barriers), but it was not done. The government did not help because of the erroneous belief: our light industry is uncompetitive, there is nothing to invest in it, it will be cheaper if you get it from abroad. In General, the government considered light industry, as well as agriculture, a "black hole", unworthy of investment. And we got what we have today both here and there. When we hear about the protection of Russian manufacturers of anything: machines and cars, clothes and shoes, food and furniture, etc., we always think about the shadow side of the medal from such innovations: the quality of goods. The Shoe companies lose the incentive to improve and update the range of shoes, as in the absence of imports, people will take anything. But the producers have something else in mind: the decriminalization of revenues on the domestic market of clothes and shoes.

The demand of the Russian light industry market with a total volume of 1,250 billion rubles is formed by the following sources: 230 billion rubles (18.4 %) – Russian legal producers; 240 billion rubles (19.2 %) – legal imports; 780 billion rubles (62.4 %) – illegally imported and manufactured counterfeit goods, the same picture is characteristic of the Shoe market.

Today, the population of Russia acquires about 600 million pairs of shoes, the domestic industry produced only 52 million pairs (in 2007 – 46 million pairs), 100 million pairs – comes from official imports. Where does the other four hundred and more million come from? Imported in all sorts of illegal ways, ie remains a huge amount of shoes that would be in demand if domestic Shoe companies provided financial support and legal protection.

Why is there no end to those who want to invest in the oil and gas industry? Why go to Russia car companies? Why even in agriculture there are willing to invest? And why against all these "why" investors do not go to the light industry?

The General answer is that there are no favorable conditions for investors. Therefore, everything is normal with the creation of joint ventures in the oil and gas and automotive industries, where Ministers and governors monitor each enterprise. And here officials will be afraid to take bribes and will not drive investors around the bureaucratic circle. And the opening of light industry enterprises, due to their small volumes, is entirely in the hands of officials. In addition, foreign firms argue: why in Russia to create enterprises, to take risks when there are our goods and so well buy?

And there are Russian and Western firms in China, where the ideal conditions for investment; where cheap, disciplined labor; where a stable favorable tax system ...

Today the equipment at the enterprises of light industry is extremely worn out. The coefficient of renewal in recent years is 0.4 – 0.6 % per year. While at foreign enterprises technological equipment is replaced every 5-7 years, that is 15-20 % annually. How to compete here?

For technical re-equipment of the industry need funds. They can either be earned by the enterprises themselves, or provided in the form of loans, or come from foreign investors. The capacity of the enterprises

themselves is very limited. Loans from commercial banks are expensive, the government does not encourage concessional lending, foreign investors in the industry, as already mentioned, do not go.

Hence the answer to the question, what to do? First, to provide loans to enterprises at minimum interest rates, and even better – without such (as farms producing food, under the national project "Development of agriculture"). Secondly, to create such conditions that foreign companies go into the light industry, carrying in addition to capital their design, production culture, management, etc.

It should be noted that the last twenty years have shown that light industry enterprises are very responsive to the slightest attention to them by the authorities, to changes in the situation. Take at least 1991, known for default. Rose import, and then revived light industry. There were three years of growth. Another example. Extremely low export duties on raw hides led to their mass export abroad. Leather and Shoe factories were without raw materials. In 2000, a protective duty was imposed on the export of leather up to 500 euros per ton (instead of 100 euros). As a result, the production of finished leather increased from 1.1 to 2.2 billion square decimeters. Instead of importing the leather goods started their export.

In favor of the fact that the resuscitation of light industry is not only necessary, but also possible, say today the examples of successful work of individual enterprises in the SFD and ncfo, both old and newly created. Let's name at least some.

Novorossiysk Shoe factory "breeze – Bosphorus" (General Director - I. K. Zykov), the company was established on the "bare spot", gives 16 million pairs of shoes a year and all the shoes in demand.

Rostov enterprise "Gloria jeans" (General Director – V. V. Melnikov). It is also new, started with the cooperative. It provides products for 7 billion rubles (up to 10 % of all Russian garments and up to 30 % – children). His products go abroad, including in the United States.

So what is "Home" to lean on and work it light industry caught in such a difficult situation, especially in the SFD and NCFD.

We are not talking about the fact that the revival of light industry would help to solve the social problems of small and medium-sized cities of the southern Federal district and skfo, where more than 16 million people live today. Here, with the beginning of the reform, small factories (branches of associations) were the first to die. But they seem small across the country, or industry. While for the district center in 10-20 thousand of the population any Shoe factory on 300 workers is a large, city-forming enterprise which not only gave money to the budget and let out the goods necessary for the population, but also provided worthy life to many inhabitants of the small city or the regional center, and here factory didn't become ...

Unlikely in these cities someday will build factories or branches in the defense plants, and lepramuseet – please. But so far, as far as we know, the problem in such a statement is not even discussed by the government.

There is no concern about another problem, not even the threat posed by the collapse of the light industry. Earlier at each enterprise of light industry, as well as any other, there were mobilization reserves (the equipment, tools, materials, etc.) allowing within days in case of the beginning of war to pass to release of necessary army of production. Instead of shoes stitching canvas boots instead of suits and coats, shirts and jackets, instead of "trendy sheepskin" – the soldiers ' coats, etc. God forbid this happens – we will not put on and put on our army, especially as the southern Federal district and the skfo border districts with a difficult situation.

This is another reason why it is necessary to seriously engage in light industry.

A very acute situation with the provision of children's shoes. Most Russian Shoe companies continue to reduce the production of children's shoes due to the high price increase due to the cancellation of subsidies from the Federal budget, and some Shoe factories, including in the southern and North Caucasus Federal districts, have stopped production altogether. In 2016, compared with 2007, the production of children's shoes stopped altogether.

In the consumer market of the southern Federal district and skfo of products for children of domestic manufacturers actively pushed by foreign suppliers that can afford to pass on the implementation of shoes with the condition of payment after the actual sale. However, the flow of beautiful and fashionable children's shoes, which flooded our markets from abroad, for the most part does not have certificates of conformity, not to mention hygienic certificates, which is a crime against children.

The consumer demand acts as the main factor influencing formation of the range which, in turn, is directed to the maximum expansion and satisfaction of demand of the population.

Consumer demand combines a whole group of indicators that will form a niche for domestic shoes, namely:

taking into account the age characteristics and employment:

shoes for children;

shoes for the elderly;

leisure shoes;

special purpose shoes;

office shoes.

for socially vulnerable group of people:

shoes for the unemployed receiving social benefits;

shoes for pensioners;

shoes for persons with chronic diseases.

taking into account the peculiarities of the regions:

shoes national;

shoes exclusive;

shoes elite.

Thus, the implementation of the requirements of the main parameters that form customer demand, will form the distinctive features that must meet the new range of shoes.

The parameters that determine demand include:

competitive advantages; the product must have distinct features or distinct advantages over competitors ' existing analogues, products, or services on the market;

social orientation; it is necessary that the product fits into the existing social conditions, so that the proposed product corresponds to the existing lifestyle and system of values of the consumer;

the ability to satisfy the customer; the product must perform all functions to meet the key needs and requests of the buyer.

The following set of measures is proposed:

creation of a regional program for the development and maintenance of domestic Shoe production in the district;

the adoption of measures to reduce the import of shoes imported to the region. These measures should include, first of all, the suppression of trade in shoes smuggled in and without authorization for their sale in local markets;

assistance in employment of young professionals, University graduates on existing and newly created Shoe enterprises;

assistance to enterprises in the process of promotion of domestic Shoe brands in local markets. First of all, it is necessary to develop a competent marketing strategy for regional Shoe companies;

creation of the special program of crediting of the enterprises of light industry of the region considering specifics of production: seasonal character of the sold production and feature of turnover of working capital of the enterprises of branch.

In our opinion, for the successful implementation of all these measures, the interest of both Federal and regional and municipal branches of government in the restructuring of Shoe enterprises is necessary, which will provoke a decrease in prices for component materials, energy costs and transport, providing the manufacturer at the expense of the price niche to offer domestic consumers demanded and competitive shoes. All this together will provide the industry with a long life and a stable position not only in domestic, but, most importantly, in foreign markets. We need only good will and interest of all participants in the implementation of the proposed activities. Such progress has been made, and the strong will and desire of the parties concerned is now required. The range for the formation of the consumer niche is shown in Fig. 17 [25-26]

Rice. 17. The range for formation of a consumer niche taking into account features of regions of southern Federal district and SKFO

And again, the state of quality of domestic goods is the main base, the basis for the success of modern domestic enterprises. This conclusion has the right to life, because quality is the oldest value of mankind. And it is the quality of Russian goods, services and management that we are losing in the global competition. Have you ever seen complex products with the inscription made in Russia anywhere in the world? Neither did we...

Long hoped for the world ISO system. Alas, in the Russian conditions it fell into crisis. Sorry, dear colleagues from the world of quality certification, but it's time to publicly list what it has become and what almost everyone recognizes among themselves:

– an immense number of documents, to navigate in which there is no strength;

– senselessness of many of them (for example, under the terms of ISO job descriptions are required, and all rush on the move to throw something, and then forget them without a trace);

– one entrepreneur once said: "We have passed ISO certification." And then he added: "do Not think we have certified such a Norwegian company." Do you have any idea what this is about? Yes, the sale of certificates. Not everyone, of course, sell, but the reputation of random does not happen.

So what now, you say, and not to do? No, you just have to understand that the light wedge on the ISO is not converged.

Let's agree on terms. Quality is what? Compliance with the standards, the majority will answer. Of course, where standards are possible, they are. Although standards have tolerances. And the difference between the upper and lower divisions in these tolerances is significant. And there are boundaries of standardization. For example, the contact with the client. Everyone knows that the quality of such contact is crucial for the success of the business, when prices, assortment, terms are aligned under the pressure of competition. Can be considered standard certain set of friendly words, dress code etc. Although we know that they are covered.

The current fascination with descriptions of business processes is also gradually approaching absurdity. And somewhere already reached it: at different firms we meet already rigid description of interview not only at employment, but even the standard on meeting and on negotiating.

Now there is a different approach: quality – is consistent with the needs of the client, the user. Who buys, the and assesses. You just need to understand exactly what he appreciates. If you hit – here it is, the required quality, i.e. the degree of customer satisfaction with the properties of the goods.

But this approach is limited and stretches from the last century. Then the formula was indisputable: the buyer is always right. In our time, much rather another imperative: the buyer does not know our capabilities.

Where are we? The concept of quality as compliance, the need becomes obsolete. Today, it becomes much more capacious to understand it as a comparison with another product or with the same, but the same. Compared to the superiority of the product over the product, service over the service of a specialist over a specialist organization on organization. Comparison with a standard or need does not imply superiority. Only equality is possible there. The standard and the need indicate a minimum. And who needs enough minimum? Not much. But superiority is interesting to all, because the law of increasing needs is inexorable [6-8].

In practice, this means switching the quality assessment system to levels. For example:

A. Sufficient quality below which there is a defect, i.e. the minimum permissible use of which will not cause damage.

B. Reference quality – on the principle of compliance with the standard, i.e. the best of the available. The standard can appear from the standard, but any sample can serve them: from that live we have in the company, at competitors or at least somewhere in the form known to us.

B. avant-Garde quality – what is achieved for the first time, exceeds the standards, but can count on effective demand and yield to profitability immediately or in the future.

This is the vertical of quality. It may allow more degrees. And yet: it is time to abandon the idea that any quality can be measured. You can assess everything, but lends itself to measurement much of what is important to us.

For rice. 1.3 a model of a comprehensive process of quality management of products and services produced both in individual regions and in the footwear industry as a whole is presented.

The model is a closed system of control (regulation), implementing the principle of regulation "by deviation". Product quality in the consumer market can be characterized by a multidimensional indicator of quality Q. In the process of conformity assessment, testing and certification of products, a documented indicator of product quality Qd is formed. The required high quality index Q0 is specified in the technical documentation for the best world samples, technical regulations, national GOST and international ISO standards. [27]

In the process of comparison of these two values, conducted by the competition Commission, the deviation of the actual quality indicator from the specified:

$Q = Q0 – Qd.$

This deviation Q (mismatch in control systems) in our case is always non-negative (Q), since the correctly chosen high level Q0 is always higher than or equal to the actual Qd, which is almost extremely rare. In this case, we have a system with a non-zero static error, which is most typical for static systems with their inherent stability and speed, the accuracy of which is determined mainly by the gain and power of the "proportional" regulator. In our case, the function of the regulator is performed by the link "Measures to ensure a given level of quality of products and services", modeling the quality management system of the enterprise, quality service in the workplace, whose actions take into account the assessment of product quality and recommendations of the competition Commission.

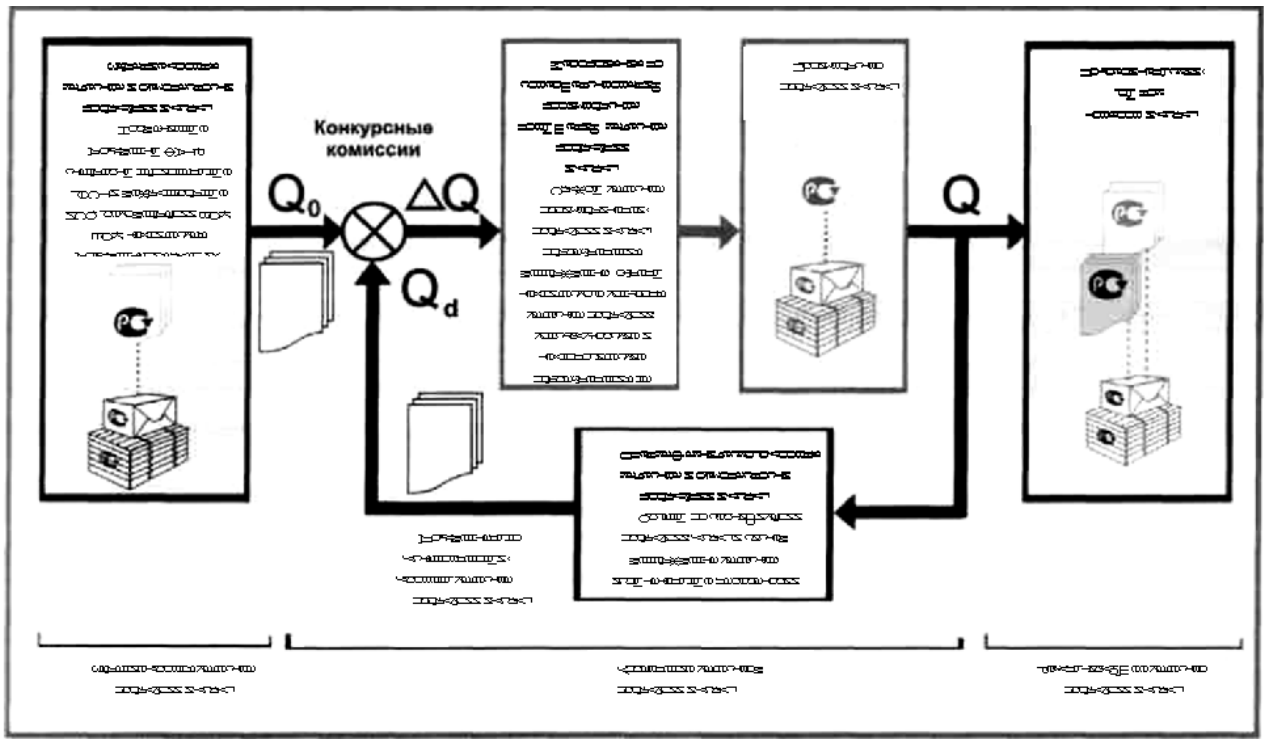

Figure 18. model of integrated process of quality management of products and services in the region

As shown in Fig. 1, quality

Q products produced and supplied to the market are formed in the process of its production as a result of measures to improve production, improve the quality of products and services carried out by the quality service and quality management units, targeted actions, which in turn are determined by the results of product evaluation in the process of its implementation.

In the new economic conditions, only such production is progressive, which actively and dynamically reacts to emerging problems. The principle "to produce only what is necessary, when it is necessary, and as much as it is necessary", demands adaptation of the Shoe enterprises to conditions of release of production in small parties with frequent change of the range of footwear, i.e. to conditions of a lot of assortment small-scale production. The effectiveness of the Shoe company, and in many ways the ability to survive in competition, depend on the ability to quickly and cost-effectively restructure the production of shoes according to fluctuations in demand. The development and implementation of flexible production systems opens up great opportunities for this.

Technological and organizational flexibility of production systems determines the variable potential of enterprises, their ability to respond quickly and adequately to changes in market conditions and acts as a mechanism for optimizing the structure of the technological system in order to reduce the cost of shoes. Thus, the development of flexible technological processes for the production of leather products provides high efficiency with a lot of assortment of shoes and will provoke a sharp increase in demand for the products of Shoe enterprises of the southern Federal district and skfo. The same problems are typical for other branches of light industry. The sores are common, and their treatment can and has some small differences, but the consciousness and desire to bring them out of this swamp is possible only if the "homeland" will substitute the shoulder and the light industry will again successfully work, because the basic values in society are still preserved:

professional;
national;
panhuman..

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MODELING OF THE EVAPORATION PROCESS ON GRAY SOILS

Abstract: *In the article, evaporation of the earth soil, and evaporation of bound water from sewage sludge is considered. The volume and height of the sediment for all polluting elements were determined. Descriptions of the movement of moisture in the soil and the method of modeling the evaporation process were recommended.*

Key words: *Evaporation, gray soil, sewage, soil fertility, groundwater.*

Language: *Russian*

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МОДЕЛИРОВАНИЯ ПРОЦЕССА ИСПАРЕНИЯ НА СЕРОЗЕМНЫХ ПОЧВАХ

Аннотация: *В статье рассмотрены испаряемости серозёмных почв, и испарения связанной воды из осадков сточных вод. Определены объем и высоту осадка для всех загрязняющих элементов. Рекомендованы описания передвижения влаги в почве и методика моделирования процесса испарения.*

Ключевые слова: *Испарение, сероземные почвы, сточных вод, плодородия почвы, грунтовых вод.*

Introduction

В современных условиях для правильного использования орошаемых земель необходимо обоснование методов борьбы с засолением, регулирование водно-солевого режима почвообразовательного процесса и движение солей в почвогрунтах, составление математических моделей их процессов , что является актуальной задачей эколого-мелиоративных систем.

Основой большинства методик моделирования процесса испарения на иловых площадках является расчет величины, интенсивности или времени испарения путем непосредственного и простейшего учета гидрометеорологических условий: средней температуры воздуха, градиента температуры с дополнительным учетом эмпирических коэффициентов и продолжительности дня, а также радиационного баланса или суммарной радиации. Сюда же можно отнести и расчетные методики, в которых кроме температуры учитывают и влажность воздуха [1-5].

Materials and Methods

Испарение связанной воды из осадков сточных вод (ОСВ) в основном рассматривается в лабораторных условиях, в высокотемпературных сушильных установках [4]. Полученные при этом зависимости могут использоваться для изучения формы связи воды с частицами твердой фазы осадков [4], но не для описания закономерностей испарения связанной влаги из осадков сточных вод в естественных условиях их сушки на иловых площадках.

В результате очистки бытовых сточных вод образуется осадки. Одним из способов утилизации осадков сточных вод является использование его в качестве органоминерального удобрения, при этом одновременно решается ряд задач: исключается необходимость хранения и повышается плодородие почв. Существующая разница допустимых уровней содержания

химических веществ по различным показателям вредности **[**1-3**].**

Исходя из равномерного смешения осадков с плодородным слоем почвы уравнение материального баланса, имеет вид[5-7]:

$$C_ф.M+C_{ос}.m=C_{см}.(M+m), \quad (1)$$

где $C_ф$ – фоновая концентрация i-ого вещества, мг/кг почвы; M – масса плодородного слоя почвы, т; $C_{ос}$– концентрация i-ого вещества в осадке, мг/кг почвы; m – масса осадка, кг; $C_{см}$– концентрация i-ого вещества в в почве после смешивания ее с осадком, мг/кг почвы;

Для того, чтобы осадок можно было использовать в качестве удобрений, необходимо соблюдение следующего основного условия[2-6]:

$$C_{см}<ПДК, \quad (2)$$

где ПДК - предельно допустимая концентрация *i*-ого вещества, мг/кг почвы .

Объем *W* ($м^3$) и массы *M* (т) плодородного слоя почвы на участке определяется по формулам:

$$W = H×S, \quad (3)$$

$$M = W×r_п , \quad (4)$$

где *H* – мощность почвенного слоя, м;*S* – площадь объекта рекультивации, $м^2$;$d_{ос}$ – плотность почвы, $т/м^3$.

Масса осадка *m*, подлежащего размещению на участке, определяется из уравнения материального баланса[3-5]:

$$m=M.(C_{см}- C_ф)/C_{ос}-C_{см} , \quad (5)$$

Объем осадка V, предназначенный для утилизации на участке, составит,$м^3$:

$$V=m/d_{ос}, \quad (6)$$

где $d_{ос}$ – плотность осадка, $т/м^3$

Высота осадка будет равна ,м:

$$H=V/S, \quad (7)$$

В решении проблем загрязнения водных ресурсов Или-Балхашского бассейна большая роль отводится разработке целенаправленного использования их на земледельческих полях орошения в современных социально-экономических условиях. Сказанное вызвало необходимость проведения исследований по целенаправленному и эффективному использованию сточных вод г. Алматы в производстве кормовых культур, получение экологически чистой продукции, направленных на повышение плодородия почв, обеспечивающие высокую эффективность земледельческих полей орошения.

Необходимо определить объем и высоту осадка для всех загрязняющих элементов, содержащихся в осадке и выбрать такие объем V и высоту h при которых не будет происходить загрязнения почвы . Данные приведены в табличном виде (таблица 1).

Таблица1.Определить объем и высоту осадка для всех загрязняющих элементов(H=0.2м)

Загрязняющих элементов	Плотность осадка $d_{ос}$, $т/м^3$	Площадь S, га	Масса плодородного слоя почвы, M,т	Содержание в осадке,$C_{о с}$, мг/кг	Фоновое содержание $C_ф$, мг/кг	Концентрация *i*-ого вещества, $C_{см}$, мг/кг	Масса осадки m,кг	Объем осадки, $V,м^3$	Высота осадки, Н,м
Медь	1,2	0,5	1450	10,42	0,3	3	527,6	439,7	0,088
Фтор	1,2	0,5	1450	6,7	0,1	1	228,9	190,8	0,038
Марганец	1,2	0,5	1450	13,3	0,5	2	192,5	160,4	0,032
Фосфор	1,2	0,5	1450	12,5	3	5	386,7	322,2	0,064
Нитраты	1,2	0,5	1450	2,75	1,5	2	966,7	805,5	0,161
Свинец	1,2	0,5	1450	0,028	0,015	0,010	725	604,2	0,120
Взвещенные вещества	1,2	0,5	1450	0,6	0,30	0,35	241,7	201,4	0,040

В настоящее время ряд авторов [1-4,8] для описания передвижения влаги в почве предложили уравнение, которое может быть использовано для ОСВ после удаления свободной влаги:

$$\varphi\frac{\partial P}{\partial \tau}=\frac{\partial}{\partial X}\left(K\frac{\partial P}{\partial X}-K\rho g-a^2\frac{\partial^2\rho}{\partial\tau\partial X}\right), \quad (8)$$

где P – давление почвенной влаги; ρ – плотность воды; g – ускорение свободного падения; $\varphi=\frac{\partial W}{\partial P}$ - объемная влажность почвы; a – коэффициент, учитывающий влияние горизонтальных капилляров на вертикальную влагопроводность.

В условиях массового строительства предприятий по очистке сточных вод населенных пунктов наиболее сложной проблемой является обработка осадков. Выделенные в процессе

очистки сточных вод осадки относятся к трудно фильтруемым суспензиям коллоидного типа. Большие объемы, бактериальная зараженность, наличие органических веществ, способных быстро загнивать с выделением неприятных запахов, а также неоднородность состава и свойств осадков осложняют их обработку. Осадок имеет высокую влажность (обычно 95-98%), что затрудняет его перемещение обычными транспортными средствами без устройства напорных разводящих сетей. Влажность является основным фактором, определяющим объем ОСВ. Поэтому основной задачей обработки осадка является уменьшение его объема за счет отделения воды и получение транспортабельного продукта. В нашей стране и за рубежом технология обработки осадков сточных вод (ОСВ) практически сводится к сбраживанию их в метантенках с последующей подсушкой на иловых площадках (иловых картах).

На первой стадии испарение равно испаряемости. На втором стадии величина испарения определяется главным образом скоростью притока воды к поверхности почвы и в меньшей степени уменьшением влагосодержания в ее верхних пересохших слоях. Третья стадия наступает при практически прекратившемся восходящем движении жидкой влаги из более глубоких горизонтов и характеризуется постепенным просыханием верхних слоев почвы. Первая попытка количественного описания движения воды в почве при неполном насыщении была предпринята Букингемом. Согласно Букингему,поток влаги в почве вдоль оси z можно описать уравнением [9]:

$$Q=kd\Psi/d\,z, \quad (9)$$

где Q- поток влаги ; k- капиллярная проводимость; Ψ-капиллярный потенциал.

До настоящего времени задача о движении воды в почве в ее теоретическом аспекте еще не решена , приходится использовать эмпирические зависимости . При этом обычно учитывается глубина залегания грунтовых вод.Так,С.Ф. Аверьянов на основе обобщения материал экспериментальных исследованиий , предложил зависимость [9-10]:

$$E=E_0(1-\boldsymbol{Z}/Z_k)^n, \quad (10)$$

где E- испарение при глубине стояния грунтовых вод z; E_0-испаряемость; Z_k- критическая глубина стояния грунтовых вод; n- показатель степени, изменяющейся от 1 до 3.

Испаряемость почвы во влажном ее состоянии сильнее, чем испарение с открытой водной поверхности. Вообще испаряемость почвы наибольшая при ее живом растительном покрове, при мертвом покрове почвы — наименьшая, а с голой поверхности почвы — средняя. В целях уменьшения испаряемости почвы необходимо поддерживать поверхность поля в рыхлом состоянии (весеннее боронование полей, летнее рыхление паров) и избегать применения приемов, увеличивающих летом поверхность почвы. Имеют значение и меры, улучшающие структурность почвы и ослабляющие действие сухих ветров.

Скорость испарения воды с поверхности почвы зависит от температуры, влажности воздуха, скорости ветра, механического и структурного состава, уплатненности, цвета, влажности почвы, строения поверхности, растительного покрова и других факторов. Потери воды на испарение возрастают по мере повышения влажности почвы, достигая максимальной величины при полном насыщении ее водой. При этом величина испарения с поверхности почвы будет выше, чем со свободной водной поверхности, так как из-за шероховатости почвы единица площади ее имеет большую фактическую поверхность, чем зеркало воды[2-3,6-7,10].

На участках, покрытых растительностью, одновременно с транспирацией происходит испарение воды непосредственно почвой. Этот процесс по своему харектеру принципиально отличен от транспирации и испарения воды почвой. Следовательно, в рассматриваемом случае могут одновременно происходить три вида испарения:транспирация, испарение воды почвой и испарение осадков, задержанных растительностью[2,9]. Скорость испарения с поверхности почвы в первую очередь зависит от ее температуры, а также от влажности воздуха, скорости ветра, содержания воды в почве, ее физических свойств, состояния поверхности и наличия растительности. С увеличением влажности почвы при прочих равных условиях испарение возрастает. Темные почвы сильнее нагреваются солнцем и поэтому испаряют больше воды, чем светлые. Растительность, затеняя почву от солнечных лучей и ослабляя перемешивание воздуха, значительно уменьшает скорость испарения с поверхности почвы.

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ESTABLISHMENT OF HYDROCHEMICAL INDICATORS OF SERIOECAL SOILS IN THE SEMI-DUMP ZONE OF THE JAMBYL REGION

Abstract: *The article discusses the hydrchemical indicators of the soil of the semi-desert zone. To regulate the water-salt regimes in the design layer of the soil and soil, basing on the experimental work on the soil salinity, the salinization standards of the soil have been established.*

The hydrochemical parameters of salt transfer in the soil of various mechanical composition were determined.

Key words: *hydrochemistry, water-salt soil regime, hydrochemical indicators, filtration, washing norms.*

Language: *Russian*

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УСТАНОВЛЕНИЕ ГИДРОХИМИЧЕСКИХ ПОКАЗАТЕЛЕЙ СЕРОЗЕМНЫХ ПОЧВ В ПОЛУПУСТЫННОЙ ЗОНЕ ЖАМБЫЛСКОЙ ОБЛАСТИ

Аннотация: *В статье рассматриваются гидрохимических показателей серозёмных почв полупустынной зоны. Для регулирования водно – солевого режимов в расчетном слое почвогрунта , основывая опытных работ по изучению солеотдачи почв установлены промывных норм засоленных почв.*

Определены гидрохимических показателей переноса солей в почвегрунте различного механического состава.

Ключевые слова: *гидрохимия, водно-солевой режим почвы, гидрохимические показателей, фильтрации, промывные нормы.*

Introduction

В настоящее время в мелиорации широко применяются математические модели , дающие возможность построить прогноз водно-солевого режима почвогрунтов .

Решение этой задачи требует применение физико-математических моделей, которые дают возможность для оценки содержание солей в почвах и количественного описания законов их движения и распределения в корнеобитаемом слое почвогрунтов.

Основными методами регулирования гидрохимического режима являются воздействия на уровень грунтовых вод различными мероприятиями (орошение, промывка, рыхление почв на фоне дренажа). На формирование водно – солевого, теплового и пищевого режимов в расчетном слое почвогрунта непосредственно

влияют водно – физические и физико – химические процессы. Это обусловлено тем, что в результате орошения и промывки с применением дренажа резко изменяются условия формирования приходных и расходных элементов водно – солевого баланса, запасов солей, скорости инфильтрации, изменения передвижения влаги, испарения, оттока грунтовых вод и другие. Применение комплекса эколого – мелиоративных мероприятий позволило вытеснить выщелачиваемые токсичные соли из расчетного соля.

Materials and Methods

Определение гидрохимических показателей переноса солей в почвогрунте посвящено много работ С.Ф.Аверьянов, 1965 ; Н.Веригин, Р.Машарипов, Д.Ф.Шульгин, 1977; Н.Н.Веригин, 1953; Л.М.Рекс, 1967; Я.А.Пачевский, 1976; Э.А.Соколенко, А.А.Кавокин,1974; Л.М.Рекс, А,Е.Якиревич, 1989; Ю.М.Денисов,1981 и др. В этих работах приводится методика нахождения одного или другого показатели переноса солей в почвогрунта,однакоследует отметить,что все они сложные и многопараметричные [1-2].

Для определения гидрохимических показателей переноса солей в почвогрунте, и для построения прогноза водно-солевого режима нами использовано основное уравнение движения солей в почвогрунте[1]:

$$\partial C/\partial t = D^* \partial^2 C/\partial x^2 \pm \vartheta_ф \partial C/\partial x \pm \gamma(C_н - C), \quad (1)$$

где С-расчетное (прогнозное) содержание солей, г/л или % ; t-время, сутки; Х-глубина расчетного слоя от поверхности земли, м; $C_н$- предельная концентрация раствора, г/л или %; γ-коэффициент обмена (растворение и кристализация), 1/сут; D*- коэффициент конвекивной диффузии, $м^2$/сут; $\vartheta_ф$- фактическая скорость движения влаги в почвегрунте, м/сут. Определяется по формуле:

$$\vartheta_ф = \vee/n_a, \quad (2)$$

где ∨-скорость фильтрации, м/сут; n_a- активная пористость почвогрунтов, в долях от обьема.

Для определения гидрохимических показателей переноса солей в почвогрунте, входящие в в уравнение (1), были использованы[2-5] :

Использованные данные, которые необходимы для проведения расчетов и полученные результаты гидрохимических показателей переноса солей в почве грунте внесены в таблицу 1.

Таблица 1.Значение гидрохимических и других показателей переноса солей в почве грунте различного механического состава

Группа почв	Коэфф. фильтр. почв. $К_ф$, м/сут	Междренного расстояния,R,м	Модуль дренаж. стока,q, л/с.га	Исходное солесодержание, $С_и$,%	Допустимое солесодержание $С_д$, %	Пормывные нормы,$N_{нт}$, $м^3$/га	Продолжительность промывки, t,сут
1	2	3	4	5	6	7	8
I	3.2-5.0	400	1.61	2.0	0.30	5000	35-40
I I	2.5-3.0	300-400	0.87	2.0	0.33	6000	70-100
I I I	1.2-2.0	200-300	0.77	2.0	0.36	8000	100-150
I∨	0.6-1.0	100-200	0.64	2.0	0.40	10000	170-220
∨	0.2-0.5	50-100	0.56	2.0	0.45	12000	240-280

Продолжение таблицы 1

Активная пористость, n_a,%	Параметр Пекле,$Р_е$	Скорость Фильтрации, ∨, м/сут	Фактическая скорость, $\vartheta_ф$, м/сут	Показатель солеотдачи,α	Коэфобмена,β, 1/сут	Коэф. конвектив.диффуии, D*, $м^2$/сут	Расчетное (прогнозное) содержание солей , $С_t$,%
9	10	11	12	13	14	15	16
37	5.3	0.014	0.038	0.61	0.053	0.0072	0.30
38	2.2	0.0075	0.020	0.77	0.022	0.0088	0.34
40	1.4	0.0067	0.017	1.08	0.014	0.012	0.37
41	0.9	0.0056	0.014	1.43	0.009	0.015	0.40
42	0.6	0.0048	0.012	1.85	0.006	0.019	0.45

Из таблицы 1 видно, что скорость фильтрации (∨) и Фактическая скорость движения влаги в почвогрунте($\vartheta_ф$) уменьшается в соответствии с утяжелением механического состава. Если в легких почвах указанные показатели составляют , соответственно 0.014 и 0.0048 м/сут. ,то есть почти три раза[4-7].

Результаты подчетов показывают , что показатель Пекле значительной степени изменяется в зависимости от механического состава почвогрунтов. Значение показателя Пекле в легких почвах с особо низкой солеотдачей, снижается до 0.53, то есть более чем в 9 раз.

Значение коэффициента конвекивной диффузии в соответствии с утяжелением механического состава почвогрунтов увеличивается . Если коэффициента конвекивной диффузии в легких почвах составляют :0.0072-0.088 $м^2$/сут. то в тяжелых доходит 0.015-0.019 $м^2$/сут. то есть в зависи мости от механического состава почвогрунтов увеличивается в 2.6 раза.

Как исследования показывают ,что основной целью опытных работ по изучению солеотдачи почв явилось обоснование промывных норм засоленных почв. Промывная норма для опреснения расчетного слоя почвы определяется по В.Р.Волобуеву по следующей формуле[2-4]:

$$N=K.\alpha \lg S_н/S_t, \qquad (3)$$

где N-промывная норма ,$м^3$/га; α-параметр солеотдачи почв; $S_н$-исходное засоление почв,%; S_t, -остаточное засоление , %; K-коэффициент пропорциональности ,равный 10000.Из формулы (3) :

$$\alpha = N/ K \lg S_н/S_t \ , \qquad (4)$$

Ниже приводим таблицу 2, где определялалось по формуле (4), по данным наших опытных работ.Величина α зависит от многих факторов :от количество солей, от типа засоления, от водопроницаемости почвогрунтов и др.По нашим исследованиям при промывке почв нормой от 4000 до 8000 $м^3$/га величина α колеблется от 1.31 до 3.51 . Низкое значения (1.28 -1.31) у почв опытных площадок 1,2,3(Таблица 2).Это обьясняется тем ,что водопоницаемость почв перечисленных площадей очень низкая.Как уже говорилось выше в первой площадке для впитывания нормы 4000 $м^3$/га потребовалось 680 часов времени , во второй площадке для впитывания 8000 $м^3$/га воды 610 часов, а в третьей площадке для впитывания нормы 10000 $м^3$/га -520 часов.Как известно, чем ниже водопроницаемость , то есть скорость движения воды в почвенных порах , тем больше солей растворяются в единице обьема воды. Низкой водопроницаемости почв способствует химизм засоления (натриевый тип засоления катионногосостава и участие соды в анионном составе). Известно, что соли натрия, особенно сода (Na_2CO_3), диспергирующие действует на почву, в результате чего происодит набухание почвенной массы, которое приводит к сужению активных пор.

Для почв опытной площадки №2, №4, имеющей больший параметр солеотдача α(1.28-3.51), характерна высокая водопроницаемость. Для впитывания нормы 10000 $м^3$/га воды потребовалось всего 24 часов времени. Такая высокая водопроницаемость,обьясняется по нашему мнению, отсутствием соды в исходном засоления почвы и не появлением ее в ходе промывок. Низкой солеотдачи почв способствует так же присутствие в почве значительная количества труднорастворимой соли –гипса ($CaSO_4$-0.48%).

Таблица 2. Определение параметра солеотдачи почвы

Название почв	Тип засоления	$N_{нт}$, $м^3$/га	$S_н$,%	S_t,%	lg $S_н$/ S_t	α
Солончак луговой	Хлоридно-сульфатный	2000	0.95	0.70	0.133	1.5
		4000	0.95	0.47	0.305	1.31
		6000	0.95	0.40	0.376	1.60
Лугово-сероземная ,Сильнозасоленная	Хлоридно-Сульфатный,с учасием соды	2000	1.86	1.30	0.156	1.28
		4000	1.86	1.20	0.190	2.11
		6000	1.86	1.18	0.198	3.03
		8000	1.86	1.10	0.228	3.51
Лугово-сероземная ,Сильнозасоленная	Сулфатно-Хлоридный,с учасием соды	2000	1.44	1.20	0.079	2.53
		4000	1.44	1.08	0.125	3.20
		6000	1.44	0.78	0.266	2.26

		8000	1.44	0.60	0.380	2.11
		10000	1.44	0.50	0.459	2.18
Лугово-болотная, Опустынивщаяся Сильнозасоленная	Хлоридно-сульфатный	2000	1.72	1.40	0.089	2.25
		4000	1. 72	1.32	0.115	3.48
		6000	1.72	0.82	0.322	1.86
		8000	1. 72	0.70	0.390	2.05

Выводы.

Результаты исследования опытного участка показывают, что значение гидрохимических и других показателей(коэффициентов обмена, конвективной диффузии, и.др) переноса солей в почвегрунте различного механического состава, а также установления параметра солеотдачи почвы в различных типах засоленности почвогрунтов, для обеспечения необходимых данных при получения урожайности сельскохозяйственных культур исследуемого массива орошения.

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SECTION 23. Agriculture. Agronomy. Equipment.

QR – Issue QR – Article

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PREPARATION OF THE NATURAL LIQUID RYE FERMENT WITHOUT YEAST

Abstract: *It shows that the preparation of the natural liquid rye ferment without yeast have three stages. Food quality indicators and parameters have been defined, and a recipe for liquid rye ferment with addition of a pumpkin puree.*

Key words: *liquid rye sourdough, pumpkin puree.*

Language: *English*

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INTRODUCTION

Baking bread without sourdough is known from early times. However, nowadays it is hardly used in Kazakhstan. Its different usefulness of alimal natural, that is organic ychildren is alimal valuable human body, natural and mineral substances, vitamins, enzymes, fibers, natural and enriches pettinen biostimulation [1].

The flow rate of biotechnological processes, rye, rye-wheat, mainly for raw materials, basic ndary nandarani the quality of the mixture, i.e. depending on the properties of rye aymalina.Currently, bold, dry and liquid alimardani in the preparation of science – based sketches are used.Wide application of liquid fermented rye in obtaining finished products is of high quality.Rye alumaline quality can be determined by many factors, but most often in the composition of the nutrient medium, i.e., determines the opening of raw by growing the microflora.

The basic rules governing the composition of the nutrient mixture:

1. The direction of change of the process parameters (temperature, humidity, aeration, etc.)

2. Positive impact on the discovery of microflora, carbohydrates and other components in the composition of matter (minerals, nitrogen, vitamins, natural vegetable mixture, you can add [2].

1 gramm of flour contains millions of microorganisms.The qualitative composition of microorganisms, fungi, bacteria, actinomycetes and other micro-organisms, there are species. But in the case of a low level. Flour humidity is

15% lower than in the case of not only active microorganisms, but also semi-finished products in the production of bakery humidity of 40-50% goarland, the conditions for the development of all types of microorganisms.

Flour, amino acids, vitamins solution for microorganisms later tested for allergic reactions and the settings will be available. From this moment begins the struggle for the possession of competitive micro-organisms among the various habitats. In this case, can maintain the activity of microorganisms adapted to life not better than others. The dough bambergen lactic acid bacteria is the best conditions.And they multiply faster than others. In

addition to lactic acid, which reduces and microorganisms. First, the most important alkaline (delocalise) microorganisms (bacteria and others) wanting a neutral environment, then microorganisms (E. Coli's bacteria group) dies.Next, most importantly bacteria the acidity in acid (butyric acid, acetic acid), stop the activity.Bacteria, different types of yeast that wants the highest isyndicate environment (sacharomyces and saharomiceta), growth is only possible in aerobic conditions and other fungi.And Saccharomyces is anaerobic. It appears ottext flour raw material that can develop. The result of the cultivation on high acidity (esimal, dough) yeast, which remain to grow in anaerobic conditions and lactic acid. In this regard, asytelin lactic acid bacteria intad alcohol, lactic acid and oxygen of extraneous microorganisms are not allowed to participate in development. In this regard, lactic acid bacteria and yeast is the synergists [3].

Active life yeast of lactic acid bacteria affecting capital liquid nitrogen and carbon, which are the main source of sourdoughsubstructuring nutrition, vitamins, stimulants, farming and minerals requires. The main monosaccharides and disaccharides are consumed. Liquid nutritional mixture of flour and water is the main source of fermented milk living in certain sizes.

Liquid nutritional mixture of coal and water and increases the absorption of sugar in alumaline to increase size advised to add mashed pumpkin rye.

Light texture is instantly absorbed, composed of a large amount of carbohydrates and various features of the chemical composition of water in the presence of the size of the pumpkin, sugar, average amount, and vitamin C, pectin and relatively high dimensionality of minerals, especially iron and potassium in large quantities. And pumpkin, pumpkin and meat are carotene yellow color, which is very rich, its useful properties were determined by conducting the heat treatment in its goaltimate.

In the course of the study, independently Asites, alicyn liquid natural shymalan rye, from a mixture of flour and water only was prepared. In the study, humidity 75 % 200 g water through the flour, prepared the calculation of the amount of Alimandi.

The preparation of sourdoughwas divided into three phases. Flour without impurities of the feed water and control developed just a sample. After each phase is defined Alimandi quality indicators. Three manifestations of the General alimardani made in the phase of the 1st figure. Only flour and water are added into the first phase pickle for 24 hours at 28°C at a temperature (picture - a,).

Picture - a. the first phase of sourdough

Picture- b. the second phase of sourdough

Picture- c. the third phase of sourdough

Picture 1. Sourdoughis made in three phases

In this phase of sourdough, its surface surface blisters, and the smell becomes bad. It explains that the microorganisms in its composition evolvement. Fermented milk acidity reaches 6 degrees. A mixture of flour and water equal to the weight sour, living in these nutrient germented milk in the second phase, that is picled of 28°C 12 hours at a temperature. (picture -b).

As a result, the acidity of sourdoughreaches 9 degrees. The smell gradually turns to normal. The taste is a bit sour and the appearance becomes good.

In the third phase, add the nutritional additive equal to the weight of the starch and pickle at 28 ° C for 6 hours (picture-c).

As a result, the acidity of sourdoughreached 11 degrees. In the third phase, the taste and smell of a ready-made fermented milk appeared. When the desired sourness of sourdoughis reached and the taste and smell are characteristic to it, the multiplication cycle stops.

The high quality of preparation and quality indicators are shown in Table 1.

Table 1. Quality and performance indicators of the liquid wheat

Indicators	Multiplication cycle of products in phasal yield		
Composition	I	II	III
Black rye flour, g	50	50	100
Water, g	85	85	170
Technological part			
Total weight of fermented milk, g	135	135	270
Temperature, °C	28	28	28
Moisture, %	75	75	75
Acidity, °C	6	9	11
Duration of sourdough, hours	24	12	6

When the acidity reaches 9-13 degrees, liquid black rye's sourdough is put to the fridge for two days to supress the sourdough level. Only then it can be used. Ready-made sourdough's preserving time limit is 30 days. If it needed to be preserved more, nutrition should be added. As a nutrition we mean the equal weight of flour and water. Before adding to the sourdough the nutrition should be warmed up. After nutrition is added the sourdough needed to pickle 2.5 - 3 hours at 28-30 °C, then it can be put into the refridgerator.

After sourdough is put into the refridgerator, microorganisms of sourdough are dead for some time, and the acidity of sourdough becomes normal. If there is a right condition to the sourdough, its microorganisms evolve again.

If the temperature for sourdough is high, microorganisms develop with high rate and therefore the acidity becomes too high. It can lead to the inapplicability. Invalid sourdough is forbidden to use. Therefore, it is preserved in the fridge.

If the acidity of sourdough is not reached the right condition, mixed dough and baked bread would be of a bad quality.

Organoleptical and phisical-and-chemical indicators of the sourdough are shown in the 2nd table.

Table 2. Organoleptical and phisical-and-chemical indicators of the sourdough

Indicators	Liquid rye sourdough
Organoleptical indicators	
Color	Grey
Taste	Has its own sour taste without any additional taste
Smell	Has its own smell without any additional smell
Phisical-and-chemical indicators	
Moisture, %	75
Acidity, °C	11

With the 75% moisture of liquid rye sourdough to make 200 g dough is made its composition. To make this mixed dough we take ready-made product which was stored in the refrisgerator. First of all, it is taken from the fridge and if it is expected to warm by the room temperature, it takes long time. Therefore, it should be put into the water with 40°C temperature for 30-60 minutes till it is ready. To make it faster we need to add warm water every 5-10 minutes.

To find the quality indicator of pumpkin puree to liquid sourdough we add to flour with the 10%, 20%, 30% and 40% consistency. Sourdough composition and its quality indicator with pumpkin puree are shown in the 3rd table.

Table 3. Sourdough composition and its quality indicator with pumpkin puree

Indicators	Traditional	The quantity of pumpkin puree shown by percentage			
Composition		10%	20%	30%	40%
1	2	3	4	5	6
Sourdough, g	100	100	100	100	100
Nutritional supplement, g	100	100	100	100	100
Rye flour, g	28,4	25,56	22,72	19,88	17,04
Pumpkin puree, g	–	2,84	5,68	8,52	11,36
Water, g	71,6	71,6	71,6	71,6	71,6
Technological part					
Temperature, °C	35	35	35	35	35
Moisture, %	75	77	79	82	85
Acidity, °C	12	12	12	12	12
Power of rising	35	35	30	25	25
Duration of fermenting, hours	3,5	3,5	3,5	3	3

Conclusion

At the time of testing, the moisture content was increased by 85% and the viscosity decreased and the production was accelerated. As a result, the gastrointestinal tract of 75% of the body has been severely degraded. As a result, pumpkin urea remained uniform, without changing the acidity of the acids and accelerated its lifting forces, and reduced the amount of fermenting.

The results shown by organic and physical-and-chemical indicators have the right consistency if to this is added 30−40% of pumpkin puree.

As the experiment has shown, 10% of pumpkin puree added to the liquid rye did not show any differences, 20% of pumpkin puree added to the liquid rye reduced to the duration of fermenting for 5 minutes, 30%−40% of pumpkin puree added to the liquid rye reduced to the duration of fermenting for 30 minutes. 10% of pumpkin puree added to the liquid rye showed the difference only in the moisture. It was risen to 77%.As a result, it was shown that adding pumpkin puree to the liquid rye sourdough had no any negative impact.

Adding an increased dose of the mixture with carbon and microorganisms involved in the fermentation process, they suppress the growth of milk fermentation.

The smell of the sourdough becomes special, or rather smells like the aroma of fruit. Thus it was determined that the nutritional mixture added to the ferment activates the symbiotic viability of the ferment microorganisms. In the composition of the nutritional mixture is added the pumpkin puree, first of all it enriches its composition with hydrocarbons and other vitamins.

Estimating the baking properties of rye flour, we can say that it is optimal for the growth of symbiotic growth of sour-milk bacteria in a liquid rye ferment, and it was also proved that when preparing the starter the parameters were optimal for the ferment microorganisms.

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SECTION 2. Applied mathematics. Mathematical modeling.

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LIBRARY FOR SOME NUMERICAL OPTIMIZATION ALGORITHMS

Abstract: *In the article the library for some algorithms of realization of optimization problems in the system of computer algebra Maple is developed.*

Key words: *Maple, equation, library.*

Language: *English*

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Introduction

Some numerical methods for solving the optimization problem are based on the exact or approximate calculation of its characteristics cannot be solved by the standard library Maple [1-10]. Therefore, by collecting separate algorithms for solving the optimization problem in a separate library, we can contribute to the solution of this problem [9-11].

Let us consider the process of developing a library to implement an optimization algorithm in a Maple computer algebra system.

Materials and Methods

The development of a library of Maple NumOpt_MuratM.MapleLib for solving some numerical optimization problems

Library development NumOpt_MuratM. MapleLib implementing the chord method

Numopt library code:

```
> restart:
  NumOpt := table():
  NumOpt[horda] :=proc(f, otrezok, eps, M)
   local x, a, b, c, ff, i:
  x := lhs(otrezok):
  a := op( rhs( otrezok ) )[1]:
  b := op( rhs( otrezok ) )[2]:
  ff := unapply(evalf(f), x):
  c := b - ff(b)*(b-a)/(ff(b)-ff(a)):
  if (ff(a)*ff(b) > 0)
  then print("неверно введённый интервал")
   else
  if (ff(a)*ff(b) < 0)
  then
  while (abs(ff(c)/M) > eps and f(c) ≠ 0)
   do
  if (ff(a)*ff(c) > 0)
  then a := c:
  else
  b := c:
  fi:
  c := b-ff(b)*(b-a)/(ff(b)-ff(a)):
  end do:
  else
  if (ff(a)=0)
  then c := a:
  else
   c := b:
    end if:
    end if:
  x := evalf(c):
  end if:
   end proc:
```

Connect the library

```
> read(`D:/NumOpt_MuratM.MapleLib`);
  with(NumOpt);
```

[bisection, dixotomi, gold, horda, newton, newton_mod]

Code using the library NumOpt for method chords:

$$f := x \to x - 5\sin\left(\frac{1}{(x-1)^2+1}\right); fl := x - 5\sin\left(\frac{1}{(x-1)^2+1}\right);$$

$$a := 0; b := 3.5; eps := 10^{-3};$$

$$f := x \mapsto x - 5\sin\left(\frac{1}{(x-1)^2+1}\right)$$

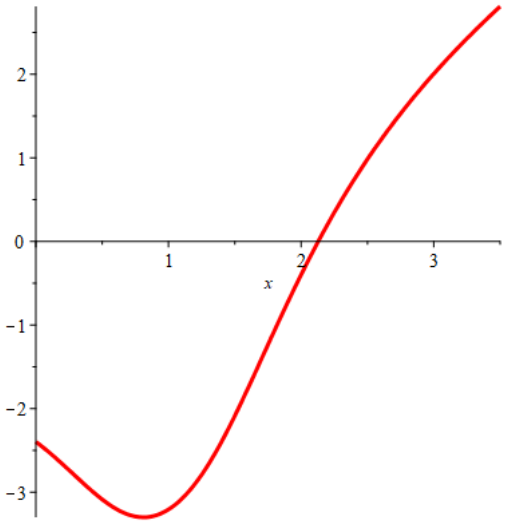
$$fl := x - 5\sin\left(\frac{1}{(x-1)^2+1}\right)$$

$$a := 0$$

$$b := 3.5$$

$$eps := \frac{1}{1000}$$

$$graph := plot(fl, x = a..b, color = red, thickness = 3);$$

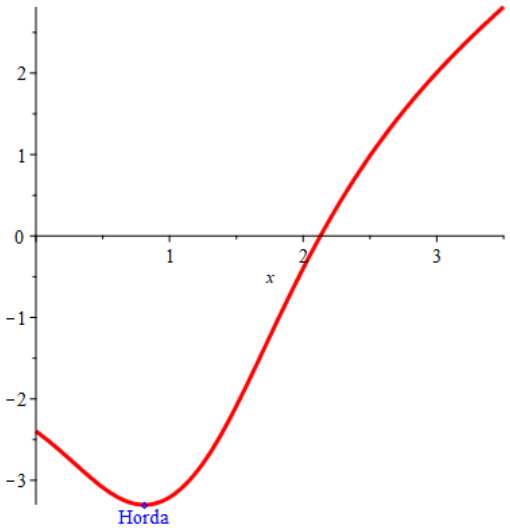



```
f2 := diff(f1, x);
x_xopda := horda(f2, x = a..b, eps, 1);
y_xopda := f(x_xopda);
with(plots) :
p := pointplot([x_xopda, y_xopda], color = blue) :
p1 := textplot([x_xopda, y_xopda,'typeset'("Horda")],'align'='below', color = blue) :
display(graph, p1, p);
```

$$f2 := 1 + \frac{5\,(2x-2)\cos\left(\dfrac{1}{(x-1)^2+1}\right)}{\left((x-1)^2+1\right)^2}$$

$$x\_xopda := 0.8113132771$$

$$y\_xopda := -3.300699391$$



Library development NumOpt_MuratM.MapleLib implementing the Golden section method

Numopt library code:

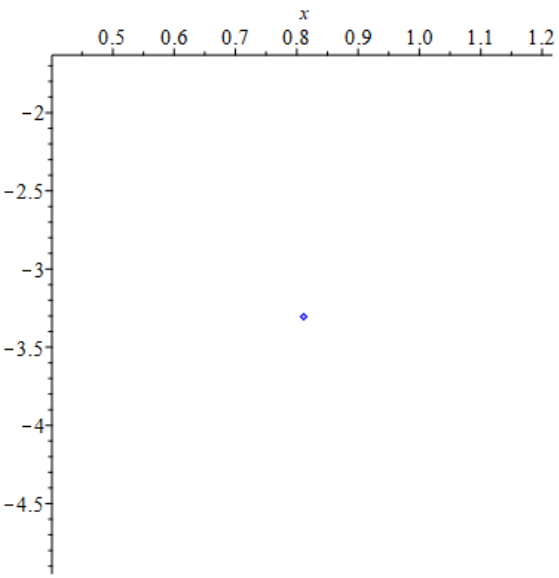
```
> NumOpt[gold]:=proc(a, b, eps::numeric,
  f::procedure, niter::evaln)
  local n, aa, bb, ab, xa, xb, fa, fb, fxa, fxb, r;
  global DEB;
  r := evalf(sqrt(5)-1)/2;
  fa := f(a); fb := f(b);
  aa := a; bb := b;
  xa := bb-r*(bb-aa); xb := r*(bb-aa)+aa;
  fxa := f(xa); fxb := f(xb);
  for n from 1 to 100
  while (abs(bb-aa)>eps) do
  if (fxb<fxa) then
  aa := xa; fa := fxa;
  xa := xb; fxa := fxb;
  xb := bb+aa-xa;
  fxb := f(xb);
  else
  bb := xb; fb := fxb;
  xb := xa; fxb := fxa;
  xa := bb+aa-xb;
  fxa := f(xa);
  fi;
  ab := (aa+bb)/2;
  if DEB=1 then print(n, ab, f(ab)); fi;
  od;
  niter := n-1;
  ab;
   end:
```

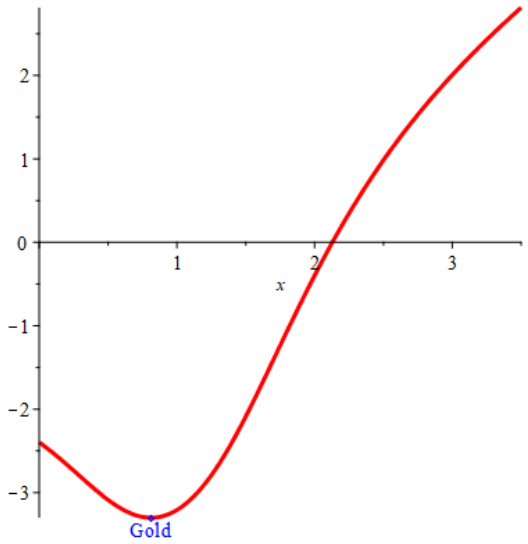
Code using the library NumOpt for the method of the Golden section:

```
x_золотоесечение := gold(evalf(a), evalf(b), eps, f, n);
y_золотоесечение := f(x_золотоесечение);
with(plots):
s := pointplot([x_золотоесечение, y_золотоесечение], color = blue);
s1 := textplot([x_золотоесечение, y_золотоесечение, typeset("Gold")], align='below', color = blue):
display(graph, s, s1);
```

$$x\_золотоесечение := 0.8113338800$$

$$y\_золотоесечение := -3.300699407$$





Library development NumOpt_MuratM.MapleLib performing the method of dichotomy

Numopt library code:

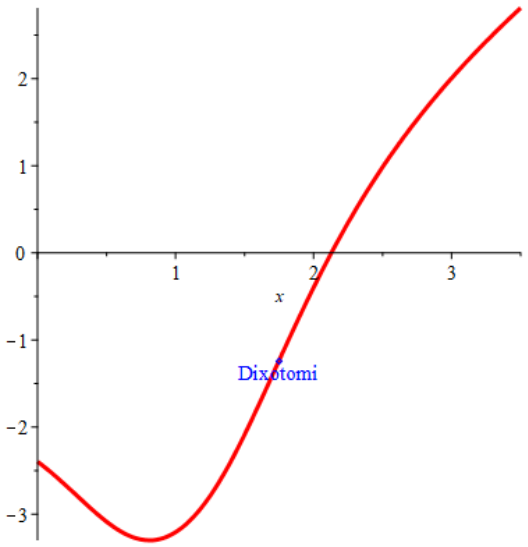
```
> NumOpt[dixotomi]:=proc(f, otrezok, epsilon)
   local x, a, b, c, ff, i:
  x := lhs(otrezok):
   a := op( rhs( otrezok ) )[1]:
  b := op( rhs( otrezok ) )[2]:
  ff := unapply(evalf(f), x):
  if (ff(a)*ff(b)>0)
  then print("неверно введённый интервал"):
   else
    if (ff(a)*ff(b)<0)
    then
  while (abs(b-a)>epsilon and f(c)<>0)
     do
  c := (a+b)/2:
     if (ff(a)*ff(b)>0)
     then a := c:
     else
     b := c:
     fi:
  end do:
  else
   if (ff(a)=0)
  then c := a:
       else
            c := b:
         end if:
    end if:
  x := evalf(c);
  end if:
   end proc:
```

Code using the library NumOpt for the method of dichotomy:

```
x_дихотоми := dixotomi(f1, x = a..b, eps);
y_дихотоми := f(x_дихотоми);
with(plots) : e := pointplot([x_дихотоми, y_дихотоми], color = blue) :
e1 := textplot([x_дихотоми, y_дихотоми,'typeset'("Dixotomi")],'align'='below', color = blue) :
display(graph, e, e1);
```

$$x\_дихотоми := 1.749145508$$

$$y\_дихотоми := -1.238937316$$



Library development NumOpt_MuratM.MapleLib implementing Newton's method

Numopt library code

```
> NumOpt[newton]:=proc(x0, eps, nmax)
  local x, dx, ff, i;
  x := x0;
  ff := f(x);
  dx := 2*eps;
  i := 0;
  #print (i,x,dx,ff);
  printf(`i=%2d x[%2d]=%8.5f dx=%6.0e f(%8.5f)=%10.5f
  \n`, i, i, x, dx, x, ff);
  for i to nmax while abs(dx)>eps do
  dx := evalf(ff/df_f(x));
  x := x-dx;
  ff := f(x);
  #print (i,x,dx);
  printf(`i=%2d x[%2d]=%8.5f dx=%6.0e f(%8.5f)=%10.5f \n`, i, i, x,
     dx, x, ff);
  od;
  printf(`Answer x[%2d]=%8.5f`, i-1, x);
  return x;
   end proc:
```

Code for using the NumOpt library for the Newton method

```
fa := f(a);
df := diff(f1, x$1);
subs(x = a, df);
df_f := unapply(df, x);
 evalf(df_f(a));
x_ньютон := newton(0.5, eps, n);
y_ньютон := f(x_ньютон);
with(plots) : r := pointplot([x_ньютон, y_ньютон], color = blue) :
r1 := textplot([x_ньютон, y_ньютон,'typeset'("Newton")],'align'='below', color = blue) :
display(graph, r, r1);
```

$$fa := -5\sin\left(\frac{1}{2}\right)$$

$$df := 1 + \frac{5\,(2x-2)\cos\left(\dfrac{1}{(x-1)^2+1}\right)}{\left((x-1)^2+1\right)^2}$$

$$1 - \frac{5\cos\left(\frac{1}{2}\right)}{2}$$

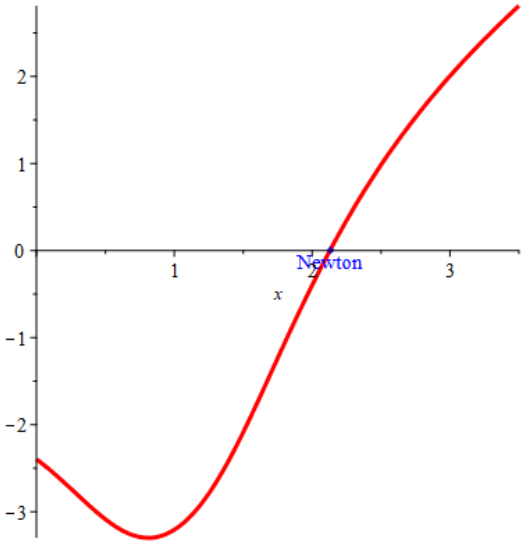
$$df\_f := x \mapsto 1 + \frac{5\,(2x-2)\cos\left(\dfrac{1}{(x-1)^2+1}\right)}{\left((x-1)^2+1\right)^2}$$

$$-1.193956405$$

```
                                  -1.193956405
i= 0 x[ 0]= 0.50000 dx= 2e-03 f( 0.50000)=  -3.08678
\ni= 1 x[ 1]=-2.01068 dx= 3e+00 f(-2.01068)=  -2.50667 \ni= 2 x[
2]= 1.54879 dx=-4e+00 f( 1.54879)=  -1.92662 \ni= 3 x[ 3]= 2.12730
dx=-6e-01 f( 2.12730)=  -0.00409 \ni= 4 x[ 4]= 2.12867 dx=-1e-03 f
( 2.12867)=  -0.00000 \ni= 5 x[ 5]= 2.12867 dx=-6e-07 f( 2.12867)=
 -0.00000 \nAnswer x[ 5]= 2.12867
```

$$x\_ньютон := 2.128671429$$

$$y\_ньютон := -1.10^{-9}$$



Library development NumOpt_MuratM.MapleLib implementing the modified Newton method

Numopt library code:

```
> NumOpt[newton_mod]:=proc(x0, eps, nmax)
  local x, dx, ff, df0, i;
  x := x0;
  ff := f(x);
  df0 := df_f(x);
  dx := 2*eps;
  i := 0;
  #print (i,x,dx,ff);
  printf(`i=%2d x[%2d]=%8.5f dx=%6.0e f(%8.5f)=%10.5f \n`, i, i, x,
     dx, x, ff);
  for i to nmax while abs(dx) > eps do
  dx := evalf(ff/df0);
  x := x-dx;
  ff := f(x);
  #print (i,x,dx);
  printf(`i=%2d x[%2d]=%8.5f dx=%6.0e f(%8.5f)=%10.5f \n`, i, i, x,
     dx, x, ff);
  od;
  printf(`Answer x[%2d]=%8.5f`, i-1, x);
  return x;
   end proc:
```

Library development NumOpt_MuratM.MapleLib implementing the bisection method

Numopt library code:

```
> NumOpt[bisection]:=proc(Eq, otrezok , eps)
  local f, a, b, i, c:
  Digits := length(floor(a))-log[10](eps) + 2 :
  f := unapply(Eq, x) :
   a := op( rhs( otrezok ) )[1]:
  b := op( rhs( otrezok ) )[2]:
   for i from 0 while (b − a) > eps do
   c := ((a + b) / 2) :
  if evalf(f(a) * f(c)) < 0 then b := c :
  else a := c :
  fi:
  od:
   end proc:
```

Next, save the created library to the computer disk:

```
save(NumOpt, `D:/ NumOpt_MuratM.MapleLib`);
```

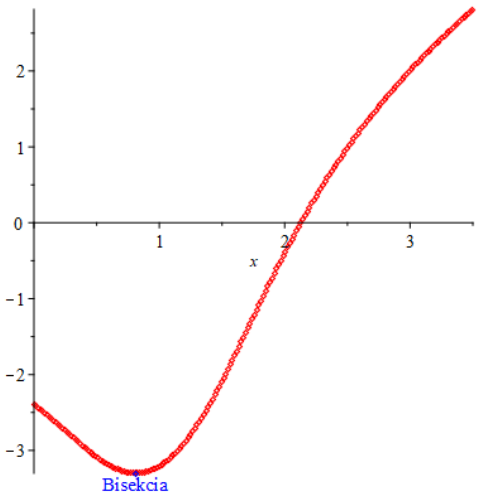
Code for using the NumOpt library for the bisection method:

```
Eq := diff(f1, x);
x_бисекция := bisection(Eq, x = evalf(a) ..evalf(b), eps);
y_бисекция := f(x_бисекция);
with(plots) :
m := pointplot( [x_бисекция, y_бисекция], color = blue) :
m1 := textplot( [x_бисекция, y_бисекция,'typeset'("Bisekcia") ],'align'='below', color = blue) :
 display(graph, m, m1);
```

$$Eq := 1 + \frac{5\,(2x-2)\cos\left(\frac{1}{(x-1)^2+1}\right)}{\left((x-1)^2+1\right)^2}$$

$$x\_бисекция := 0.8109130859375000$$

$$y\_бисекция := -3.300698618$$



Library development NumOpt_MuratM.MapleLib implementing the search for a local minimum by the method of half division

```
NumOpt[LocalMinimum]:=proc(f, otrezok , eps)
 local f, a, b, i, c:
Исходные функции
f:= 12*surd(6*(x-1)^2, 3)/((x+1)^2+8):
f1:= 12*surd(6*(cl[i]-1)^2, 3)/((cl[i]+1)^2+8):
f2:= 12*surd(6*(cr[i]-1)^2, 3)/((cr[i]+1)^2+8):
Отрезки локализации
a1:=-1: b1:= 2:
Точность шагов
prec:= 0.001:
Задание левой и правой начальной точки, а также области
i:= 1:
l[i]:= a1:
r[i]:= b1:
Area[i]:= r[i]-l[i]:
while Area[i]>2.4*prec do
cl[i]:= (l[i] + r[i])/2 - prec:
cr[i]:= (l[i] + r[i])/2 + prec:
Определение новых точек
l[i+1]:= `if`(f1 > f2, cl[i], l[i]):
Определяем новую область
r[i+1]:= `if`(f1 ≤ f2, cr[i], r[i]):
Определяем новую область
Area[i+1]:= r[i+1]-l[i+1]:
Определяем x как возможное решение
x:= (r[i+1]+l[i+1])/2:
rezx1:= x:
rezy1:= f:
i:= i+1;
 end do:
  "Первый локальный минимум:"; "Абсцисса:";
 rezx1;
 "Ордината:";
  rezy1;
 end proc:
```

Library development NumOpt_MuratM.MapleLib implements search of local maxima and global maximum by the method of division in half

```
 "Абсцисса:";
 rezx1;
 "Ордината:";
 rezy1;
 i:= 1:
 l[i]:= a2:
 r[i]:= b2:
 Area[i]:= r[i]-l[i]:
 Вычисление второго максимума
 while Area[i]>2.4*prec do
 cl[i]:= (l[i] + r[i])/2 - prec:
 cr[i]:= (l[i] + r[i])/2 + prec:
 l[i+1]:= `if`(f1 < f2, cl[i], l[i]):
 r[i+1]:= `if`(f1 ≥ f2, cr[i], r[i]):
 Area[i+1]:= r[i+1]-l[i+1]:
 x:= (r[i+1]+l[i+1])/2:
 rezx2:= x:
 rezy2:= f:
 i:= i+1;
 end do:
 "Второй локальный максимум";
 "Абсцисса:";
 rezx2;
 "Ордината:";
 rezy2;
 "Глобальный максимум";
 "Абсцисса:";
 xgl:= `if`(rezy1>rezy2, rezx1, rezx2): xgl;
 "Ордината:";
```

```
NumOpt[LocalGlobalMaximum]:=proc(f, otrezok , eps)
local f, a, b, i, c:
 Исходные функции
f:= 12*surd(6*(x-1)^2, 3)/((x+1)^2+8):
f1:= 12*surd(6*(cl[i]-1)^2, 3)/((cl[i]+1)^2+8):
f2:= 12*surd(6*(cr[i]-1)^2, 3)/((cr[i]+1)^2+8):
Отрезки локализации
a1:=-3: b1:= 0:
a2:= 1: b2:= 4:
Точность шагов
prec:= 0.001:
i:= 1:
l[i]:= a1:
r[i]:= b1:
Area[i]:= r[i]-l[i]:
while Area[i]>2.4*prec do
cl[i]:= (l[i] + r[i])/2 - prec:
cr[i]:= (l[i] + r[i])/2 + prec:
l[i+1]:= `if`(f1 < f2, cl[i], l[i]):
r[i+1]:= `if`(f1 ≥ f2, cr[i], r[i]):
Area[i+1]:= r[i+1]-l[i+1]:
x:= (r[i+1]+l[i+1])/2:
rezx1:= x:
rezy1:= f:
i:= i+1;
end do:
"Первый локальный максимум:";
```

```
ygl:= `if`(rezy1>rezy2, rezy1, rezy2):ygl;
 end proc:
```

Library development for the minimum function of two variables "by the NumOpt_MuratM.MapleLib implements the search method of the fastest descent»

```
NumOpt[SpuskLocalMinimum]:=proc(f, otrezok , eps)
local f, a, b, i, c:
f:= 1.2*x1^2 + 1.8 * x2^2 - 4 * x1 - 4 * x2:
Определяем производные по двум переменным
df1:= diff(f, x1);
df2:= diff(f, x2);
x1prec:= solve(df1, x1):
x2prec:= solve(df2, x2):
Начальное приближение
X1[1]:=-1:
X2[1]:=-1:
prec:= 0.01:
i:= 1:
x1rez:= 0:
x2rez:= 0:
while x1rez=0 do
x1:= X1[i]:
x2:= X2[i]:
x1rez:= `if`(df1<prec,(`if`(df1>-prec, X1[i], 0)), 0):
x2rez:= `if`(df2<prec,(`if`(df2>-prec, X2[i], 0)), 0):
X1[i+1]:= `if`(df1>0, X1[i]-prec, X1[i]+prec):
X2[i+1]:= `if`(df2>0, X2[i]-prec, X2[i]+prec):
i:= i+1:
end do:
```

```
"Точные значения:";
x1 := x1prec;
x2 := x2prec;
"Точка минимума:";
x1 := x1rez;
x2 := x2rez;
"Значение функции в минимуме:";
f;
  end proc:
```

The considered methods give high accuracy of finding extremums of the function.

	Значения, найденные средствами Maple 7	Найденные методом половинного деления	Разница в результатах Вычислений
min	(1 , 0)	(1.000093628 , 0.003746629028)	0.000093628 , 0.003746629028
1 max	(-2.0 , 5.039684200)	(-2.000093628 , 5.039684194)	0.000093628 , 0.000000006
2 max	[{ x = 3.0 }, 1.442249570]	(3.000093628 , 1.442249569)	0.000093628 , 0.000000001

Значения, найденные методом наискорейшего спуска	Значения, найденные средствами Maple 7
x1 := 1.67 x2 := 1.11 y= -5,55554	[{ x1 = 1.666666667 , x2 = 1.111111111 }, −5.555555555]

Conclusion

As a result of the study, the algorithms of numerical methods for solving equations and solving numerical optimization problems based on the methods of half division, search for extrema functions, as well as the method of the steepest descent were studied. It can be concluded that:

• Algorithms on Maple for solving numerical optimization problems are obtained

• Numopt_muratm Library was developed.MapleLib implements numerical methods for solving equations and numerical optimization

• The library has been tested on several examples

• The resulting library can be used in research and calculations.

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SECTION 2. Applied mathematics. Mathematical modeling.

QR – Issue QR – Article

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THE DEVELOPMENT OF THE LIBRARY IN MAPLE IMPLEMENTS THE ALGORITHMS OF THE METHOD OF INTERIOR POINT

Abstract: *In this paper, we develop a library for Maple implementing algorithms for applying the method of internal points.*

Key words: *Maple, interior point, library.*

Language: *English*

Citation: Utemgaliev, D., & Shevtsov, A. (2019). The development of the library in Maple implements the algorithms of the method of interior point. *ISJ Theoretical & Applied Science, 05 (73),* 266-272.

Soi: http://s-o-i.org/1.1/TAS-05-73-37 ***Doi***: https://dx.doi.org/10.15863/TAS.2019.05.73.37

Introduction

The created library will be based on the previously used algorithms for the method of internal points. The name of the library InteriorPointUtemgaliev.MapleLib.

Set the names of algorithms:

- IP_Plot
- IP_OptimalAllocation
- IP_Slack
- IP_Slack_new
- IP_L3

Connection of the library is carried out by the command

```
read(`D:\InteriorPointUtemgaliev.MapleLib`):
with(InteriorPoint);
```

```
[IP_L3, IP_OptimalAllocation, IP_Plot, IP_Slack, IP_Slack_new]
```

Library code:

```
restart:
InteriorPoint := table( ):

InteriorPoint[IP_Plot] :=proc(Equation, x1, x2) local n:
with(plots):
plot3d(Equation, x[1]=x1, x[2]=x2, shading=zhue, axes=boxed, style
   =patchcontour, contours=10);
end proc:
```

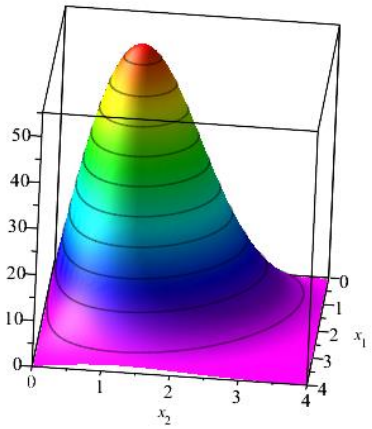
Code of the main program:

```
restart;
read(`D:\InteriorPointUtemgaliev.MapleLib`):
with(InteriorPoint);
                    [IP_OptimalAllocation, IP_Plot]
```

Наша целевая функции приведена в виде параболоида:

```
F := 100·x[1]·x[2]*exp((-x[1]^2)/3 - (x[2]^2)/3);
IP_Plot(F, 0..4, 0..4);
```

$$F := 100\, x_1\, x_2\, e^{-\frac{x_1^2}{3}-\frac{x_2^2}{3}}$$



Library code:

```
InteriorPoint[IP_OptimalAllocation] := proc(ob, con1, con2) local F, xx1, xx2, my1,
    my2, my3, my4, my5:
with(plots):
xx1 := evalf(solve(solve(convert(con1, equality), x[2]) = solve(convert(con2,
    equality), x[2]), x[1]), 5):
xx2 := eval(solve(convert(con1, equality), x[2]), x[1] = xx1):

my1 := plot(solve(convert(con1, equality), x[2]), x[1] = 0..10, color = red, thickness
    = 2):
my2 := plot(solve(convert(con2, equality), x[2]), x[1] = 0..10, color = green,
    thickness = 2):
my3 := plots:-contourplot(ob, x[1] = 0..5, x[2] = 0..5, color = black, contours = 10);
my4 := plots:-pointplot({[xx1, xx2]}, axes = boxed, symbol = solidcircle, symbolsize
    = 20):
my5 := plots:-textplot([xx1, xx2, "Optimal Allocation"], align = {ABOVE, RIGHT},
    font = [times, bold, 16]):
print([eval(ob, {x[1] = xx1, x[2] = xx2})], x[1] = xx1, x[2] = xx2]);
plots:-display({my1, my2, my3, my4, my5}, view = [0..4, 0..5]);

end proc:
```

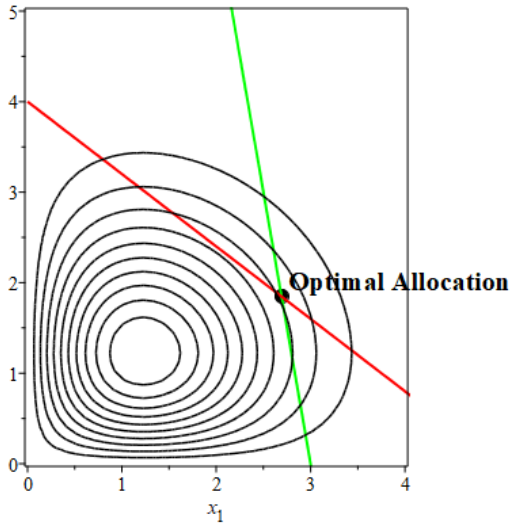
Code of the main program:

Теперь мы можем построить такую целевую функцию с соответствующими ограничениями и найти оптимальное решение следующим образом:

```
restart;
read(`D:\InteriorPointUtemgaliev.MapleLib`):
with(InteriorPoint);
F := 100·x[1]·x[2]*exp((-x[1]^2)/3 - (x[2]^2)/3):
ogr_1 := 4·x[1] + 5·x[2] ≤ 20:
ogr_2 := 6·x[1] + 1·x[2] ≤ 18:
IP_OptimalAllocation(F, ogr_1, ogr_2);
```

$$[IP\_OptimalAllocation, IP\_Plot, IP\_Slack]$$

$$[14.24508347, x_1 = 2.6923, x_2 = 1.846160000]$$



Library code:

```
InteriorPoint[IP_Slack] :=proc(ob, con1, con2) local F, xx1, xx2, my1, my2, my3,
    my4, my5, Slack1, Slack2, L:
xx1 := evalf(solve(solve(convert(con1, equality), x[2]) = solve(convert(con2,
    equality), x[2]), x[1]), 5):
xx2 := eval(solve(convert(con1, equality), x[2]), x[1] = xx1):

my1 := plot(solve(convert(con1, equality), x[2]), x[1] = 0..10, color = red, thickness
    = 2):
my2 := plot(solve(convert(con2, equality), x[2]), x[1] = 0..10, color = green,
    thickness = 2):

Slack1 := rhs(con1) - lhs(con1):
Slack2 := rhs(con2) - lhs(con2):

L := ob - λ·(ln(Slack1) + ln(Slack2)):

my3 := plots:-contourplot(eval(L, λ = 0), x[1] = 0..10, x[2] = 0..10, color = black,
    contours = 10):
print(Slack1); print(Slack2); print(L);
print(my3);
print(plots:-display({my1, my2, my3}, view = [0..4, 0..5])):
end proc:
```

Code of the main program:

Теперь решим вышеуказанную проблему, используя метод внутренней точки

Введем новую переменную slack

$$y \geq 0$$

неравенство

$$A \cdot x \leq b$$

можно преобразовать в форму

$$A \cdot x + y = b$$

Это означает, что наши ограничения могут быть записаны как:

```
4·x[1] + 5·x[2] + 20;
6·x[1] + 1·x[2] + 10;
```

$$4\,x_1 + 5\,x_2 + 20$$

$$6\,x_1 + x_2 + 10$$

```
4·x[1] + 5·x[2] + y = 20;
6·x[1] + 1·x[2] + y = 10;
```

$$4\,x_1 + 5\,x_2 + y = 20$$

$$6\,x_1 + x_2 + y = 10$$

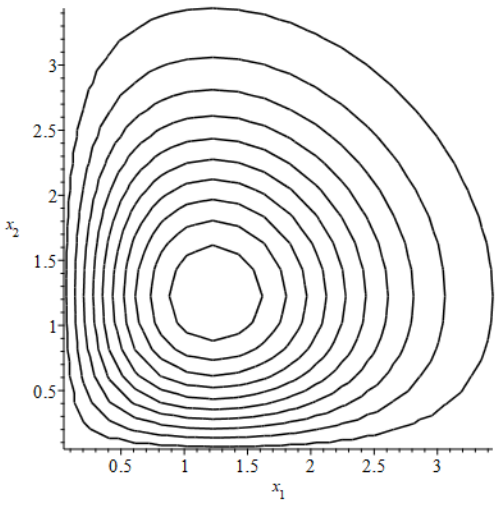
```
restart;
read(`D:\InteriorPointUtemgaliev.MapleLib`) :
with(InteriorPoint);
F := 100· x[1]·x[2] * exp( (-x[1]^2)/3 - (x[2]^2)/3 ) :
ogr_1 := 4·x[1] + 5·x[2] ≤ 20 :
ogr_2 := 6·x[1] + 1·x[2] ≤ 10 :
IP_Slack(F, ogr_1, ogr_2);
```

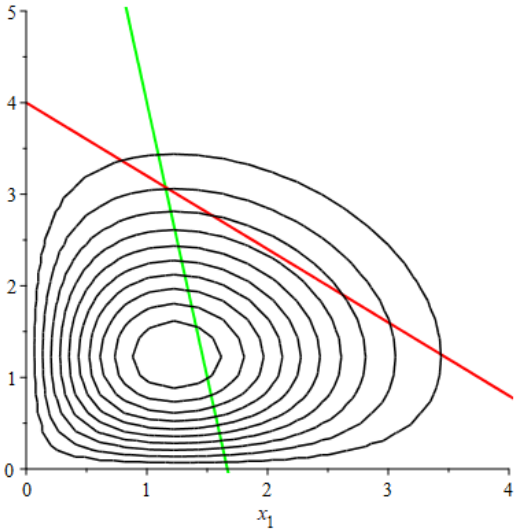
$$[IP\_OptimalAllocation, IP\_Plot, IP\_Slack]$$

$$20 - 4\,x_1 - 5\,x_2$$

$$10 - 6\,x_1 - x_2$$

$$100\,x_1\,x_2\,e^{-\frac{x_1^2}{3}-\frac{x_2^2}{3}} - \lambda\left(\ln\left(20 - 4\,x_1 - 5\,x_2\right) + \ln\left(10 - 6\,x_1 - x_2\right)\right)$$





Код библиотеки:

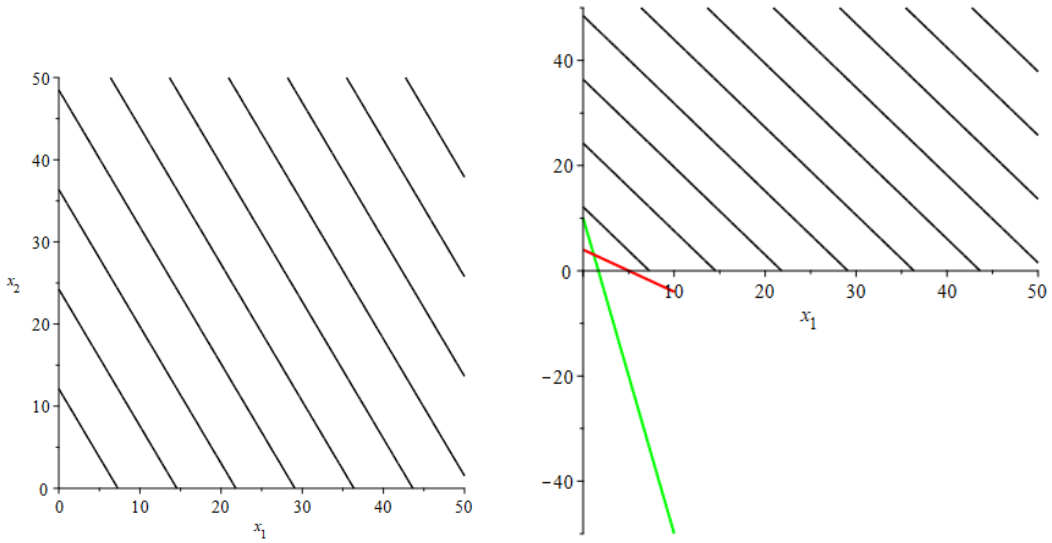
```
InteriorPoint[IP_Slack_new] :=proc(ob, con1, con2) local F, xx1, xx2, my1, my2,
    my3, my4, my5, Slack1, Slack2, L_new :
xx1 := evalf(solve(solve(convert(con1, equality), x[2]) = solve(convert(con2,
    equality), x[2]), x[1]), 5) :
xx2 := eval(solve(convert(con1, equality), x[2]), x[1] = xx1) :

my1 := plot(solve(convert(con1, equality), x[2]), x[1] = 0 ..10, color = red, thickness
    = 2) :
my2 := plot(solve(convert(con2, equality), x[2]), x[1] = 0 ..10, color = green,
    thickness = 2) :

Slack1 := rhs(con1) - lhs(con1) :
Slack2 := rhs(con2) - lhs(con2) :

L_new := (-lhs(con1) - lhs(con2))/2 - λ·(rhs(con1) - log(lhs(con1)))
    + log(Slack2)) :
print(L_new);
my3 := plots:-contourplot(eval(L_new, λ = 0), x[1] = 0 ..50, x[2] = 0 ..50, color
    = black, contours = 10) :

print(my3);
print(plots:-display({my1, my2, my3}));
end proc:
```

Code of the main program:

```
restart;
read(`D:\InteriorPointUtemgaliev.MapleLib`) :
with(InteriorPoint);
F := 100·x[1]·x[2] * exp((-x[1]^2)/3 - (x[2]^2)/3) :
ogr_1 := 4·x[1] + 5·x[2] ≤ 20 :
ogr_2 := 6·x[1] + 1·x[2] ≤ 10 :
IP_Slack_new(F, ogr_1, ogr_2);
```

$$[IP\_OptimalAllocation, IP\_Plot, IP\_Slack, IP\_Slack\_new]$$

$$-5x_1 - 3x_2 - \lambda\left(20 - \ln\left(4x_1 + 5x_2\right) + \ln\left(10 - 6x_1 - x_2\right)\right)$$



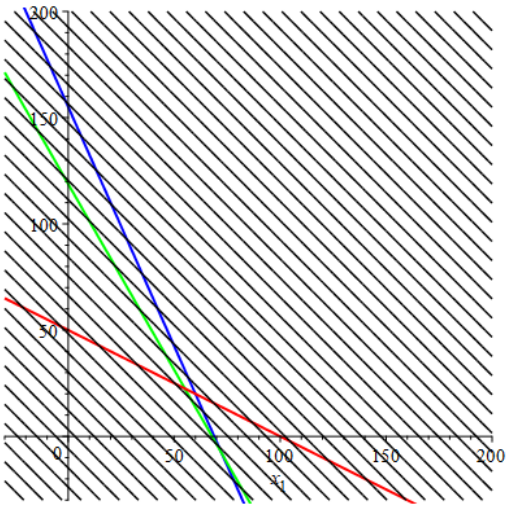
Library code:

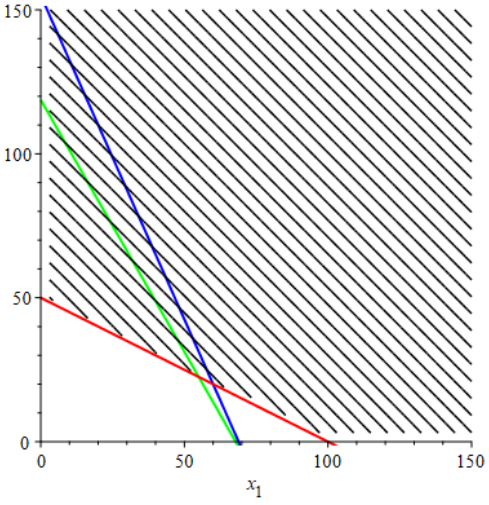
```
InteriorPoint[IP_L3] := proc(ob, λ0, con1, con2, con3, og) local my0, my1, my2, my3:
my0 := plot(solve(convert(con1, equality), x[2]), x[1] = og, color = red, thickness
    = 2):
my1 := plot(solve(convert(con2, equality), x[2]), x[1] = og, color = green, thickness
    = 2):
my2 := plot(solve(convert(con3, equality), x[2]), x[1] = og, color = blue, thickness
    = 2):

my3 := plots:-contourplot(eval(ob, λ = λ0), x[1] = og, x[2] = og, color = black,
    contours = 50):
print(plots:-display({my0, my1, my2, my3}, view = [og, og]));
 end proc:
```

Code of the main program:

```
restart;
read(`D:\InteriorPointUtemgaliev.MapleLib`):
with(InteriorPoint);
F := x[1] + x[2] - λ·(ln(x[1] + 2·x[2] - 100) + ln(x[1]) + log(x[2])):
ogr_1 := -x[1] - 2·x[2] + 100 ≤ 0:
ogr_2 := -14 x[1] - 8·x[2] + 950 ≤ 0:
ogr_3 := -9 x[1] - 4·x[2] + 620 ≤ 0:
λ0 := 0:
IP_L3(F, λ0, ogr_1, ogr_2, ogr_3, -30..200);
λ0 := 0.1:
IP_L3(F, λ0, ogr_1, ogr_2, ogr_3, 0..150);
```

```
[IP_L3, IP_OptimalAllocation, IP_Plot, IP_Slack, IP_Slack_new]
```





The library is compiled and saved by the command:

```
save(InteriorPoint, `D:\InteriorPointUtemgaliev.MapleLib`):
```

Conclusion

As a result of the study, a review of the main methods of mathematical optimization for problems with constraints: the method of internal points, the problem of mathematical optimization, simplex method, projective gradient descent, ellipsoid method, the method of internal point, the problem of quadratic programming, the theoretical foundations of linear optimization. Algorithms of application of methods of internal points in Maple are considered. The existing methods used by the Maple optimization package are studied. Algorithms interior point method for Maple. Developed the library in Maple implements the algorithms of the method of interior point. The created library has been tested and can be used in solving optimization problems by the method of internal points.

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SECTION 29. Literatur0065.

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ON THE NATURE OF THE TRANSFORMATIONAL METHOD (INTERPRETATION OF THE NATURE OF THE TRANSFORMATIONAL METHOD)

Abstract: *The present article deals with the analysis of the existing the theoretical conceptions on the transformational method, interrelation of deep and surface sentence structures and the status of kernel sentence with all its transforms in expressing semantic-grammatical relations in speech.*

Key words: *transform, transformation, language layers, system, nominative, constructive, compressive, stylistic, derivation, paradigm, grammatical meaning, grammatical form.*

Language: *English*

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Introduction

One of the specific features of the transformational method is seen in the use of elementary algebraic rules. Mostly we can observe this in N.Chomsky's transformational Grammar [6, P.136]. Today the usage of the rules of transformational grammar in such spheres as mathematical linguistics, computer techniques testifies that transformation is still remaining as an important theory at this moment. The main reason of this is that formation of transforms during the transformation process is based on the notion invariance and the issue that every transformation should have correct grammatical forms makes up one of the major terms. Of course, the transformation is of dynamic character but not static. The notion dynamic character is more complex than that of static character. Actually it stipulates for not only language development, but also its usage in practice [1, P.130]. Because in the process of language use linguistic and extralinguistic factors intersect.

Materials and Methods

During this process turning of the kernel structures into derivative structures serves effectively to form the speech. This, in its turn, shows the creative feature of transformation. Serious attention is paid to the realization of surface syntactic structure on the basis of kernel structure in the formation of the derivative structure in N.Chomsky's transformational grammar.

In this process not only grammatically correct, but also transformation of contentially weighty sentences should be in the focus of attention. From this point of view N.Chomsky's understanding differs from the conceptions of American structuralism.[7, P.27]

The force of N.Chomsky's transformational grammar is seen in the factor that every sentence structure, every word combination structure is analysed not within a separate vacuum, but with other neighbouring sentences and word combinations in close and organic interrelation. Its essence is great, because usage of the language system in speech is connected with that kind of condition" [4, P.131].

In fact, we can see the dynamic feature of the language first of all by means of the sentence. That is why N.Chomsky considers the sentence as the major unit of the language, but not the phoneme or the morpheme.

His view on the sentence, consisting of abstract units, formation of derivative structures based on concrete rules stood on the agenda of his investigations. That is why N.Chomsky's theory on the sentence was of algorrithmic feature. In other words, it won't be an exaggeration if we say

N.Chomsky's transformational grammar lies on the basis of mathematical linguistics.

Transformational grammar of N.Chomsky pays attention to semantic peculiarities of the components of the sentence too. Theme – rheme relations of the components of the sentence were also the object of analysis. In fact, semantic problems were not the object of the early research works of the American scientists of structuralism. But we witness N.Chomsky's serious attention to the issues of semantics in transformational grammar. N.Chomsky's generative grammar came into being in the second half of the past century. It was a great positive event in world linguistics. He could give full comments of the transformation rules alongside with dynamic character of transformation in the work.

According to him the following rules belong to them:

Specific rules on the wholeness of the sentence (phrase) structure formation and lexics.

The rule of transforming the deep structure into a surface.

Semantic component rule interpreting the amount of the content of the deep structure.

Phonological component rule interpreting the norms of the pronunciation of the surface syntactic structure [10].

This proves that semantics was taken into consideration in generative grammar. Besides, we can see the general rule of transformation also is not devoid of the notion semantics. In accordance with the meaning of the basic sentence it does not change in the transform of the given sentence.

Besides the view given above, it's worth pointing out one more fact that it has become a tradition to define one of the transforms as a kernel sentence during the transformation analysis. The simplest with the fewest grammatical morphemes of transforms get the status of a kernel sentence. However deep structure notion is being effectively used in structural linguistics. Besides that, there exist the notion "basic sentence". This condition, of course, may cause inconveniences for the researcher.

It would be desirable if linguists shared the same view regarding this problem. Especially, transformational analysis is in need of this.

We think that the deep structure lies on the basis of formation of any sentence. But the deep structure is of abstract character. For example, let's pay attention to the word "… ёзди" (wrote). This word requires the deep structure with abstract character. Its abstractness is seen in the fact that there is a chance to form a number of sentences with the help of it at the same time: хат ёзди, ариза ёзди, китоб ёзди, шеър ёзди etc. If one of the chances gets realized, in our opinion, the kernel structure is formed: хат ёзди. At the same time one can observe abstractness from the communicative point of view. Because, despite the formed syntactic field of the predicate in this position, its doer is still remaining abstract. When the doer, the subject, is added, expression of the statement is fully formed and we consider this structure as the kernel structure transformation: Нодир хат ёзди.

Now transformation phenomenon gets realized on the basis of the kernel structure: Нодир хат ёзди, хат Нодир томонидан ёзилди, Нодирнинг хат ёзиши.

On the basis of this fact we conclude that any kernel structure appears on the basis of a deep structure. The basic kernel structure for transformation is of invariant status. We can see the proof in the formation of transforms. Invariant status of a certain structure always adapts to concrete speech situation and the will of the speaker. It is very important. Actually, there is a definite situation behind any sentence. This situation in the widest meaning of it serves as the denotatum (referent), verbal sentences, particularly invariant structure, transforms serve as significats. In other words, if the denotatum is considered to be an extra linguistic factor, while the - a semantic-syntactic factor.

At the same time as the deep structure is being expressed by the verb, it performs the function of the predicate standing in the centre of the kernel sentence, as well as propositive structure of transforms.

As is known, deep structure has always empty places to be filled in (we have spoken about it above). After empty places have been filled there appears a chance for sentence transformation.

If chances are wider for transformation paradigm of transforms come into being because the speaker has the freedom of choice of syntactic structures at this moment.

We'd like to point out the fact that syntactic structures that constitute paradigm of transforms may require not only elementary sentences, but word combinations, composite syntactic constructions also. Let's address to the following sentence to prove our view: Инсоният пайдо бўлибдики, шу савол устида бош қотиради (Ў.Хошимов. Дафтар хошиясидаги битиклар)

The given example requires a composite structure (traditional composite sentence). If we involve it in transformation, the following paradigm is formed:

1.Инсоният пайдо бўлибдики, шу савол устида бош қотиради

2.Пайдо бўлгандан буён, инсоният шу савол устида бош қотиради.

3.Шу савол инсониятнинг бошини у пайдо бўлгандан бери қотиради.

4.Пайдо бўлгандан бери инсониятнинг шу савол устида боши қотиши.

As is seen, the given composite syntactic structure has been transformed into a composite sentence, a word combination and syntactic structures having the status of a composite syntactic construction. Of course, there is a special situation

behind each transform. In other words, each transform is linked with a back language situation. But we see transforms to be general from the point of view of content. So, at the moment all the transforms are expressing a single situation. If each of the transforms had a connection with a certain situation, the paradigms of the transforms would not come into being. A single situation is a significat even in the transformation based on contamination: Китобни келтир. У стол устида, Қайси китоб стол устида турган бўлса, ўша китобни келтир.

In this case the first transform (Стол устида турган китобни келтир) is based on contamination. Mixture of the first two sentences causes contamination. Elementary sentences are forming invariant structures. In other words, elementary structures acquire the status of a kernel sentence.

Transforms are formed in any transformational process. This, in its turn, gives the speaker a chance to select syntactic structures. Every syntactic structure in use is founded on a certain kernel.

As R.Rasulov points out correctly: "… the main objective of the method of transformational analyses is to perform the task of determining the existence of basic sentences which perform the function of the kernel on the basis of different sentences which get realized in our speech, that they originate from kernel sentences, … their semantic-grammatical relations"[8, P.254]

The following idea of R.Rasulov is worth paying attention too "So, the method of transformational analysis studies the syntactic level of the language system, its several microsystems as well."[8, P.254]

The notion of transformation is used with regard to syntactic structures in our work. R.Rasulov's special accent to this is very important for the researcher to take a right direction.

N.Z.Gadjiyeva's monograph "Major directions of the development of syntactic structures in Turkic languages"[5, P. 212-327]. A lot of positive views have been told on putting into practice transformation with regard to materials of Turkic languages. But that was not the first approach to Turkic languages through transformation method. This method was used to the materials of the Uzbek language by N.Turniyazov in his candidacy dissertation "Attributive clauses in Uzbek and French languages"[9] as the main method of analysis. Appreciating N. Gadjiyeva's achievements in this field, we would like to point out shortcomings of the work. While expressing her views concerning composite sentences, N. Gadjiyeva calls dependent parts as subordinates of transforms. In our opinion, it is not desirable to consider a part of the composite sentence to have the status of a transform. Actually, in accordance with the general rule, the whole composite sentence should be a transform. In this case the first form of the composite sentence taken for analysis is considered to be the main variant and other variants formed on this base perform the functions of its transforms.

Besides that, N.Gadjiyeva did not mention the names of the creators of transformation Z.Harris and N.Chomskiy in her work, nor in the bibliography.

J.B.Buranov also expresses his views on transformation. He points out correctly that transformations occur in the process of syntactic structures in speech. The scholar gives information about the inner and surface structures and says that this plays an essential role in the formation of the transformation phenomenon: "Every sentence has inner, surface structures. The inner structure is expressed by means of different transformation variants. The inner structure used in descriptive linguistics expresses semantics of the sentence, while the surface structure - the formal structure of the sentence" [3, P.283].

J.Buranov understands transformation in the following way and we fully agree with him: "Model (pattern) selection method or secondary structure based on the main kernel structure is transformation. This method happens on the basis of mutual relation of the meaning and formal structures of the sentence [3, P.283]." One can see that scholar's views are based on the ideas of the representatives of American structuralism. Well-groundedness of the views can be proved at any time. Besides, J.Buranov`s contribution was great in applying transformation theory to the language materials. It is clearly seen in introducing transformation to grammar rules.

T.Bushuy and Sh.Safarov speak of the influence of the transformational grammar as a science: "The direction of the transformational grammar is fully changing attitudes towards the grammatic system.

Nowadays grammar as a science is not only a simple descriptive analysis of the collected material, but at the same time a demand to illucidate the universal features of it is being put on the agenda.

As a result of the introduction of transformation rules into grammatic analysis gave a chance to describe syntactic structures in the simplest way than other thoretical directions [2, P.116].

Conclusion

As is seen, position of transformation in present day linguistics is high enough, actually, all types of it are being actively used in the process of speech.

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SECTION 31. Economic research, finance, innovation, risk management.

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INFLUENCE OF BRAND ON THE COMPANY'S TRADE POLICY

Abstract: *This article is devoted to branding issues in the implementation of the company's trade policy. The essence of the concepts of the brand, entry into the market under the influence of the brand and competitive advantages are explained. It also shows the benefits that the company achieves with the help of the brand and the negative effects of trade policy.*

Key words: *brand, trade policy, trademark, trademark, state brand, market, competition, efficiency.*

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ВЛИЯНИЕ БРЕНДА НА ТОРГОВУЮ ПОЛИТИКУ КОМПАНИИ

Аннотация: *Эта статья посвящена вопросам брендинга при реализации торговой политики компании. Объяснены суть понятий бренда, вход на рынок под влиянием бренда и преимущества при конкурентной борьбе. Так же показаны преимущества, которых достигает компания с помощью бренда и отрицательные последствия торговой политики.*

Ключевые слова: *бренд, торговая политика, торговая марка, торговый знак, бренд государства, рынок, конкуренция, эффективность.*

Introduction

При деятельности компании в рыночных условиях внешняя и внутренняя конкуренция, желания и сила воли потребителей, стремление прижиться на рынке и удержание своей репутации в рыночных позициях требуют формирование политики бренда и лидерства в сфере торговли. На сегодняшний день бренд стал неотъемлемой частью современного бизнеса и философией компании. Сложно представить активную деятельность компании без политики бренда. Давайте, рассмотрим термин “бренд”.

Materials and Methods

Слово “бренд” происходит от английского слова, которое означает “горячий утюг”, штамп. Роль и место бренда в современном обществе формировались в течение длительного периода развития человеческой цивилизации. Отдельные протоэлементы будущих товарных обозначений появились еще в первобытнообщинной формации, период существования которой ознаменовался зарождением знаковой символики. Праздничные одежды, вышивка, орнамент, амулеты, татуировка и наскальные рисунки представляли собой первые формы демонстративной символики. Особые символы и знаки определяли социальный статус членов племени и использовались для обозначения принадлежности вещей и предметов членам общины. На камнях египетских пирамид обнаружены знаки и символы, принадлежавшие тем, кто в 3200 г. до н. э. обрабатывал камни [1, с. 5].

В литературных источниках не приведены общие описания термина “бренд”. Данный термин имеет разнообразную характеристику, некоторые из них мы рассмотрим ниже.

По описанию профессора бизнес-колледжа Линдби – Карла Бондорффа:

Бренд – это название, термин, символ, рисунок или комбинация этих элементов, направленный для иденцификации и дифференции товаров и услуг от продукции конкурентов.

Бренд – это необычное название, символ, дизайн или образ, используемый для идентификации конкретного товара или компании.

Бренд, или брэнд (англ. бранд — клеймо) — комплекс представлений, мнений, ассоциаций, эмоций, ценностных характеристик о продукте либо услуге в сознании потребителя. Ментальная оболочка продукта или услуги. Бренд является абстрактным названием. Физическими составляющими (носителями) бренда является весь комплекс элементов фирменного стиля: название бренда (слово, словосочетание), логотип с принципами его построения, палитра фирменных цветов, поддерживающая фирменный стиль оригинальная графика, набор фраз, звуки, торговая марка и прочее [8].

В определении понятия «бренд» существует несколько устойчивых позиций. Бренд – это:

– название, термин, знак, символ, идентифицирующий товар;

– неосязаемая сумма свойств продукта: его имени, упаковки, репутации и т.п., делающих коммерческое предложение уникальным,

– хорошо известная потребителю марка;

– образ, имидж, репутация компании;

– набор ассоциаций (идей, воспоминаний и ощущений) в сознании потребителя [5, с. 2].

Профессор по маркетингу К.Келлер выделяет три элемента идентичности бренда:

– позиционирование бренда;

– ценности бренда;

– коды бренда [4, с . 123-153].

В специальной литературе имеют место различные точки зрения на восприятие понятий «марка» и «бренд». Многие авторы трудов по проблемам марочных технологий в категоричной форме утверждают, что «бренд – это не просто торговая марка, понятие бренда более широкое, поскольку в него еще дополнительно входят: сам товар или услуга со всеми его характеристиками, набор характеристик, ожиданий, ассоциаций воспринимаемых пользователем и приписываемых им товару, а также обещания каких-либо преимуществ, данные автором бренда потребителям – то есть тот смысл, который вкладывают в него сами создатели [3, с. 77].

Все торговые марки ежедневно сталкиваются с одной метатенденцией — потребностью в глобальном присутствии, которая реализуется в таких направлениях, как:

– консолидация региональных и национальных торговых марок в глобальные бренды;

– слияние и поглощение как основные средства управления портфельным бизнесом [2, с. 9].

Обычно большинство авторов подтверждают, что между “товарным знаком” и “брендом” имеется различие, т.к. в понимании этих категорий имеются некие заблуждения.

Все компании имеют свои торговые марки, состоящие из названия торговой марки, графического рисунка (логотипа) и звуковых символов компании (товара). Но немногие компании имеют свои собственные бренды.

Бренд можно рассматривать как систему взаимодействия социальных, эмоциональных, функциональных и экономических факторов (в свете приведенных аргументов). Из этого можно сделать вывод, что бренд является товарным знаком и сочетанием всех характеристик продукта, который появляется у пользователя при его наличии. Например, говоря о сотовых телефонах, первым приходит на ум бренд Samsung или iPhone, а при упоминании парфюма – бренд Chanel.

Консалтинговая компания Brand Finance представила ежегодный рейтинг самых дорогих брендов в мире. Amazon был лидером в рейтинге 500 брендов. По мнению авторов рейтинга, в прошлом году бренд вырос на 24,6 % и составил 187,9 млрд долларов США. Кроме Amazon в список вошли ещё пять технологических компаний.

Бренд Apple, как и в предыдущие два года, занял в списке второе место. Его стоимость возросла на 5 % и составила 153,6 млрд долларов США.

На третьем месте по списку был Google. Стоимость данного бренда выросла на 18,1 % и дошла до 142,7 млрд долларов США. В 2017 году компания возглавляла рейтинг самых дорогих брендов мира.

В список ТОП-10 вошли: компания Microsoft (119,6 млрд долларов США), Samsung (91,3 млрд долларов США), коммуникационная группа AT&T (87 млрд долларов США), Facebook (83,2 млрд долларов США), сеть банков ISBS (79,8 млрд долларов США) и телекоммуникационная компания Verizon (71,15 млрд долларов США) в Китае, Китайский строительный банк (69,7 млрд долларов США) [6].

В Узбекистане так же имеется целый ряд известных брендов. В качестве примера можно привести Artel, Ravon, Craffers, Knauf, Home market, East-West Engineering и многие другие.

Бренд Ravon является первым брендом в автомобильной промышленности Узбекистана. Не смотря на то, что был основан совсем недавно, уже

успел стать узнаваемым как внутри страны, так и за ее пределами. Под этим брендом выпускаются несколько видов автомобилей и реализуются во внутреннем и мировом рынке.

Бренд Craffers тоже стал популярным в очень короткий срок. Под этим брендом производятся шоколад и кондитерские изделия. То, что эта компания является крупным производителем страны, возможно, стало причиной скорой известности данного бренда.

В мировом и местном рынке конкурентная борьба в самом разгаре. Для того, чтобы победить в конкуренции необходимо уделить отдельное внимание вопросам бренда. Бренд имеет особое место в повышении конкурентоспособности. Т.к. в условиях конкуренции могут выжить лишь брендовые товары. Поэтому каждая компания должна стараться вывести свой продукт до уровня бренда. Этим будет заложен вклад в развитие не только компании, но и страны.

В условиях рыночной экономики название государства тоже – бренд. Например, когда вы думаете о Швейцарии и Японии что приходим вам на ум первоочередно?

Конечно, в нашей голове сформированы определенные образы и символы касательно каждой страны: например, Японию называем “Страной восходящего солнца” – она известна своей электроникой, автомобилями, роботами; или, когда говорим о Швейцарии рисуются образы часов, банков , Альпийских гор и т.д.

В глобальном рынке национальный имидж страны очень важен и ценнен. Смотря на это могут потечь инвестиции и наоборот.

Brand Finance предоставил отчет за 2018 год: были объявлены самые дорогие национальные бренды, самые сильные национальные бренды и другие, в котором были учтены 3 аспекта:

- Товары и услуги: открытость для туризма, объём рынка, условия для торговли;
- Общество: уровень жизни населения, корпоративная этика, коррупция, культура;
- Инвестиции: поддержка талантов, уровень технологической оснащённости, внимание знаниям и науке, налоги, управление [9].

Самые сильные мировые бренды (ТОП-10)

1. Сингапур (AAA+).
2. Швейцария (AAA+).
3. БАА (AAA).
4. Гонконг (AAA).
5. Нидерланды (AAA).
6. Финляндия (AAA).
7. Новая Зеландия(AAA).
8. США (AAA).
9. Норвегия (AAA).
10. Великобритания (AAA).

Узбекистан в рейтинге Brand Finance в этом году поднялся на 18 ступеней и занял 49-е место (AA-). В 2016 году – 59-е место (A+), в 2017 году – занимал 67-е (A+) место. На данный момент из стран СНГ опережает Азербайджан (AA). Такие страны, как Россия (A+), Турция (A+), Иран (A+), Казахстан (A+) стоят выше по рейтингу, чем Узбекистан [9].

Каждая компания стремится вывести свой товар до уровня бренда. Потому что это способстует повышению престижа компании и реализации продукции. Но это не легко. Для этого компания должна пройти несколько этапов. Народ должен узнавать и доверять этот продукт. Выведение компанией своего продукта до уровня бренда оказывает ощутимое влияние на его политику торговли. При этом ускоряется процесс реализации товара и стремление потребителей приобрести его с каждым днем будет расти.

В свою очередь, оказание продукта в списке брендов, означает доверие потребителей по отношению к данной продукции. Т.к. лишь, заслуживший доверие и занявший место в сердцах покупателей, продукт может подняться до уровня бренда. Если на рынке имеется 2 вида продукции, один из них – бренд, а второй менее известной марки, и, несмотря на более высокую стоимость, покупатель остановит свой выбор на брендовом продукте. Т.к. он доверяет этому продукту и, в свою очередь, платит за бренд.

Бренд, как и другое явление, имеет способность влиять на сознание потребителей и формировать их потребности.

Сильный бренд – это такой бренд (strong brand), при котором 60% потребителей его хорошо узнаёт и может отличить от других марок.

Развивающийся бренд потребители могут узнавать и отличать на 30-60%.

Слабый бренд – это, когда среди конкурентных марок, лишь 30% потребителей могут узнать данный бренд [10].

Conclusion

Политика торговли считается процессом, спасающим компанию от банкротства, кризиса и экономической немощности. Она помогает занять стабильный рыночный сегмент. Т.к. не имея эффективную политику торговли, финансово-хозяйственная деятельность компании выйдет из строя. Это можно пояснить следующим:

1. Расстройство политики торговли приводит к снижению реализации готовой продукции.
2. А понижение реализации готовой продукции становится причиной застоя оборотных средств.
3. Застой оборотных средств, засчет задолженности предприятия и роста постоянных издержек, приводит к разрыву финансовой цепочки компании.

4. А финансовые трудности снижают платежеспособность компании и приводят к экономической несостоятельности.
5. Не устранение экономической несостоятельности делает кризис компании неизбежным.

Этот анализ показывает, что повышение эффективности торговой политики является для компании чрезвычайно важной задачей. А требование современного бизнеса в повышении эффективности торговой политики – это брендинг.

Продвижение бренда в компании помогает в следующих аспектах торговой политики:

1. Повышает имидж компании на рынке.
2. Повышает привлекальность компании перед партнерами и инвесторами.
3. Даёт превосходство в конкурентной борьбе.
4. Формирует группу преданных потребителей.
5. Облегчает путь ко входу в новый рынок.
6. Способствует установлению прочных связей с обществом и государством.
7. Оказывает положительное воздействие на деятельность компании в финансовом рынке.
8. Повышается эффективность затрат на маркетинговую деятельность.
9. Понижается текучесть работников и повышается производительность труда, что приводит к снижению себестоимости продукции и в конечном итоге – падению рыночных цен.

Как видно из вышеизложенного, эффективный бренд оказывает прямое и косвенное воздействие на торговую политику и, тем самым, обеспечивает эффективность деятельности компании на рынке.

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COMPARISON OF PROSODY USED IN THE WORKS BY ALISHER NAVOI AND ABDURAKHMAN JAMI

Abstract: *In the literary environment of Hirat in XV century aruz as a scientific and theoretical science reached its peak. Works related to prosody were studied by Abdurakhman Jami in his "Risala-i Aruz" and "Mezan-ul Avzan" by Alisher Navoi. They are the best scholars who developed great significan works on prosody. Jami's "Risala-i Aruz" served as a primary source for the work of Alisher Navoi, who made use of various sources on aruz in Persian-Tajik literature. According to Navoi, no work on the theory of aruz in Turkic literature had been written before Alisher Navoi. So, the purpose of Navoi was to analysis more complete by such literary styles as bahrs, rukns, wazns and doiras. His work is perfect and it has much information on Turkic literature. Both scholars had similar opinions on the chapters of aruz – juzv, zihof and furu'. Both Navoi and Jami developed 6 juzvs, 45 zihofs and 60 furu's. Abdurahmon Jami describes four doiras but mostly researched contemporary aruz studies in "Al-Mu'jam", in particular. Alisher Navoi adds three more doiras and starts the tradition of poetry writing in two devices – komil in "Doirai Mukhtalita" and tawil in "Doirai Mushtahiba" which were described by him as matbu' (pleasant).*

Key words: *aruz (prosody), bakhr (metrical form), vazn (meter), rukn (feet), juzv (the smallest unit of aruz), zikhof (changes), furu', doira (circle).*

Language: *English*

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INTRODUCTION:

The Poems were written in prosody by poets of the Muslim East. So, they were first studied and introduced by the Arab scientist *Khalil ibn Akhmad*[1], and further developed by such scholars as *Akhfash*[2], *Abu Zakariya al-Khatib Tabrizi*[3] and *Makhmud Zamaxshari*[4].

It was in the 13th – 15th centuries when *aruz* as a scientific and theoretical science reached its peak. Works of such scholars as *Shams Qays Razi*[5], *Nasiriddin Tusi*[6], *Vakhid Tabrizi*[7], *Yusuf Azizi*[8],

[1] Khalil ibn Akhmad al-Farahidi (715/719 – 786/791) was the founder of *aruz* studies. Fragments of his *"Kitob ul-Ayn"* have reached us. His *"Ar-Risala fi-Ma'n al-Huruf" ("Treatise on the meaning of letters")*, which has also reached us, was published in 1969 in Cairo. There is information that he created *"Risalai Aruz"* about *aruz*; however, it has not reached us.

[2] *Abul Khasan Akhfash Balkhi* (died 835) was an Arab linguist who studied *aruz*. After *Khalil ibn Akhmad*, he further developed the science of *aruz*, and introduced *bahr* of *mutadorik*.

[3] *Abu Zakariya al-Khatib Tabrizi* was an Arab scholar who studied *aruz*. His *"Risala fil Aruz va Qafiya"* on the theory of *aruz* and rhyme has reached us.

[4] *Makhmud Zamaxshari* (11th c.) was a literary critic from Khorezm, the author of *"Aruzi Qustas"* on the theory of poetry. Following the traditions of the time, his work was written in Arabic.

[5] *Shams Qays Razi* (13th c.), one of the founders of studies of Persian *aruz*, was born in the city of Ray in Persia. He was the author of such works as *"Al-Mu'jam"* on *aruz* and *"Al-Mu'rab"* on Arabic literature.

[6] *Nasiriddin Tusi* (13th c.), a Persian writer and thinker, was the author of *"Me'yar ul-Ash'ar"* that consists of an introduction and two large parts on *aruz* and rhyme.

[7] *Vakhid Tabrizi* (the end of 14th c. – the beginning of 15th c.), a Persian poet and literary critic, was born in the city of Tabriz in Persia. His works on literary studies and on *aruz* in particular *"Miftoh ul-bado'i"* and *"Jam'-i-mukhtasar"* have reached us.

[8] *Yusuf Azizi* (15th c.) was a Persian poet and scholar of *aruz* studies. He lived most of his life in Herat. The influence

Abdurakhman Jami, *Sayfi Bukhari*[9], *Ataullah Khusaini*[10], *Shaykh Akhmad TaRazi*[11] and *Alisher Navoi*, created during that period, are of special importance because of their deep and complete analysis of theoretical bases of *aruz*. Among these works, *"Risala-i Aruz"* by *Abdurakhman Jami* and *"Mezan-ul Avzan"* by *Alisher Navoi* are of a great significance.

LITERATURE REVIEW:

It is a well-known fact in the academic doiras of today that *Navoi* and *Jami* held similar views and opinions and were partners in many aspects of literary and scientific work. Their works were created almost at the same time. They are: *"Hamsa"*, *"Nafohat ul-Uns"* and *"Nasaim ul-Muhabbat"* devoted to the followers of the Sufi order[12], *"Risala-i Muamma"* about the rules of solving the genre of *mu'ammo* (puzzle), philosophical works *"Lujjat ul-Asrar"* and *"Tukhfat ul-Afkar"* can illustrate this. Their works *"Risala-i Aruz"* and *"Mezan ul-Avzan"* devoted to the analysis of the theory of *aruz* are also the results of such scholarly works.

It is not known when *Jami* wrote *"Risala-i Aruz"*[13]. The fact that the work contains verses from *Khaja Ismatullah Bukhari*[14] and refers to him as *"rakhmatulloh"* (May Allah bless him and grant him peace) indicates that it was written after the death of the latter, that is, the second half of the 15th century [1, p. 202]. The treatise conseders the most important issues concerning Persian *aruz*. This is due to the fact that many works on the rules of Persian *aruz* had been created before *Jami*, including *"Al-Mu'jam"* by *Shams Qays Razi*, *"Me'yar ul-Ash'ar"* and *"Jam'i Mukhtasar"* by *Vakhid Tabrizi*.

"Mezan ul-Avzan"[15] by *Alisher Navoi* was written in 1492 – 1493, after the death of *Jami*. Unaware of *Shaykh Akhmad Tarazi*'s *"Funun ul-Balagha"* devoted to the literary studies in Turkic, *Navoi* points out that it was he who first attempted to describe the rules of the theory of *aruz* in Turkic, and no such work had been done before. In particular, he writes, "The purpose of this work is to show that poetry in Turkic has appeared; however, the rules for Turkic poetry have not been worked out". [2, p. 43]

Also, in the introduction to his work, *Navoi* refers to some works on *aruz* created before him – *"Kitab ul-Ayn"* by *Khalil ibn Akhmad*, *"Al-Mu'jam"* by *Shams Qays Razi*, *"Me'yor ul-Ash'ar"* by *Nasiriddin Tusi* and *"Risala-i Aruz"* by *Abdurakhman Jami* and says that some *doiras* (circles) and *vazns* (meters) which are not mentioned in these works will also be considered.

MATERIALS:

"*Mezan ul-Avzan*" starts with *hamd* (the lines praising Allah) and *na't* (the lines praising Prophet Muhammad). It is said in the book that *Husain Baykara* inspired *Navoi* to write it. Navoi describes *aruz* as a sacred science, stating that some verses from the Koran and some quotes from *hadith* (sayings of Prophet Muhammad) match the metre of *aruz*, and many poems from *"Divan"* (collection of poetry) of *Hazrat Ali* were written in *aruz*. Then, *Navoi* provides some information on the founder of *aruz Khalil ibn Akhmad* and the term itself. Only after this *Navoi* goes on to describe the theoretical rules of *aruz*. In contrast, *Jami* provides the description of rules of *aruz* right after the lines praising Allah. As stated above, this is due to the fact that there had been works on *aruz* before *Jami*.

Both works first provide information on the smallest unit of *aruz – juzv* and use the term *"rukn"(or the foot)* for it [3, p.75]. Both authors think that there exist six *rukns*: light and heavy *sabab*, joint and separated *watad* and little and big *fosila*.

After *juzvs*, both authors consider *"real rukns"* – they are referred to *"asl"* or *"usul"* and state that there are eight of them, as following: Faulun (V – –); Foilun (– V –); Mafoiylun (V – – –); Mustaf'ilun (–

of *Shams Qays Razi*'s "Al-mu'jam" can be traced in his *"Aruzi Yusuf"* dvoted to *aruz* studies.

[9] *Sayfi Bukhari* (died 1503) was a Persian poet and literary critic, the author of *"Aruzi Sayfi"*, *"Risala-i Mu'ammo"*, *"Risala-i Musiqi"*. His *"Aruzi Sayfi"* and *"Divan"* (collection of poetry) have reached us.

[10] *Ataullokh Khusaini* (died 1513) was a Persian scholar and literary critic, the author of *"Badoe' ul-Samoe'"* on Persian *aruz* and stylistic devices, written by the suggestion from *Alisher Navoi* in 1493.

[11] *Shaykh Akhmad Tarazi* (15th c.) was a Turkic scholar who studied poetry. His *"Funun ul-Balogha"* (written in 1436 – 1437) devoted to the ruler and astronomer *Ulugh Bek* (1394 – 1449), a descendant of T*amerlane*, has reached us. The work consists of parts covering poetical genres, rhyme, *radif*, poetical devices, *aruz* and *mu'ammo*. The last part on *mu'ammo* has been lost.

[12] *Alisher Navoi*'s *"Nasaim ul-Muhabbat"* ("The breezes of love") is a free translation of *Abdurakhman Jami*'s *"Nafahat ul-Uns"* ("The flavor of friendship"). It contains information on the life of the followers of the *Sufi order*. During the translation *Navoi* enriched *Jami*'s original work, adding some new information

[13] The edition of *"Risala-i Aruz"* in vol. 8 of the eight-volume collection of *Jami*'s works *(Abdirahmani Jami. Osor. Jildi 8)* published in 1990 in Dushanbe, Tajikistan, has been used in preparing this article.

[14] *Khaja Ismatullah Bukhari* (the end of 14c. – the beginning of 15th c.) was a famous bilingual (Turkic and Persian) poet. He lived in *Mawerannahr* (Transoxania). His *"Divan"* (collection of poetry) including fifteen genres and poem *"Ibrahim Adham"* have reached us.

[15] The edition of *"Mezan ul-Avzon"* in vol. 16 of the 20-volume complete collection of *Navoi*'s works published in 2000 by the Institute of Language and Literature of the Academy of Sciences of the Republic of Uzbekistan has been used in preparing this article.

– V –); Foilotun (– V – –); Mafoilatun (V – V V –); Mutafoilun (V V – V –); Maf'ulotu (– – – V).

Both auhors provide definitions for only five of the above mentioned. According to *Jami*, only five *rukns* are peculiar to original Persian poetry, while *Navoi* states that they are widely used in Turkic poetry as well.

After the definition of *asls*, authors continue to describe *zihof* (modifications of *asls*) and *furu'* (special *rukns*), both developed from *asls*. Both Navoi and Jami consider that there are 45 *zihofs*, compared to 35 in *"Al-Mu'jam"*[16], 35 in *"Funun ul-Balagha"*[17] [4, p.80-a] and 44 in *"Mukhtasar"*[18] [5, p.19].

METHOD:

Then, the authors consider *doiras* (circles). A doira in *aruz* is a group of similar *bahrs*. Based on doiras described in *"Al-Mu'jam"*, *Jami* considers four of them: *"Doirai Mu'talifa"* (consists of *ramal, hazaj* and *rajaz bahrs*), *"Doirai mukhtalifa"* (consists of *muqtazab, mujtass, munsarih* and *muzore' bahrs*), *"Doirai Muntazia"* (consists of *mushokil, sari', jadid, qarib* and *hafif bahrs*), *"Doirai Muttafiqa"* (consists of *mutaqorib* and *mutadorik bahrs*). [6, p. 50]

Alisher Navoi considers seven doiras. The first four of them are the same as described by *Jami*. The fifth doira, *"Doirai Mujtamia"*, is invented by *Navoi* by putting together nine *solim* (not modified) *rukns* of nine *bahrs* – four *bahrs* of the second *doira* and five *bahrs* of the third *doira*.

The sixth doira, *"Doirai Mukhtalita"*, according to *Navoi*, consists of *komil* and *vohir* bahrs. Navoi mentions that these *bahrs* are *matbu'* (pleasant), though they are not widely used in poetry and are not streamlined. So, this doira is also *Navoi*'s contribution to *aruz* studies. The seventh doira consists of three *bahrs* – *tavil, madid* and *basit*; and according to *Navoi*, they are peculiar to the Arabic literature, and are not used in other nation's poetry.

Thus, it can be seen that *Jami* in his work considers only those *bahrs* that were used in poetry of the period and describes doiras connected with them, while *Navoi* adds three more doiras and provides their extended analysis.

After the analysis of doiras, both authors consider *bahrs*. They are considered in the order of doiras to which they belong. *Jami* considers 14 *bahrs*, while *Navoi* analyses 19 of them. As stated above, while *Jami* considers only those *bahrs* that are widely used in Persian poetry, Navoi analyses, in addition to those 14 *bahrs*, also *komil, vofir, tawil, madid* and *basit bahrs* and shows that it is possible to use them in writing poetry in Turkic. In particular, *Navoi*'s own collection of poetry *"Khazain ul-Ma'ani"* includes *ghazals* (lyric poems) written in *komil* and *tawil bahrs*.

DISCUSSION:

After the general description of *bahrs*, meters are considered. In his treatise, *Jami* provides two examples from *Rudaki*[19], one example from *Khaja Jamaliddin Salman*[20] and one example from *Khaja Ismatullah Bukhari*. Of a special interest are verses from *Khaja Ismatullah Bukhari*. *Jami* brings his following verses to illustrate poetical foot of *mutaqoribi maqbuzi aslam* consisting of sixteen *rukns*:

Zihy du chashmat ba xuni mardum kushoda tiru kashida xanjar

Fau'lu fa'lun fau'lu fa'lun fau'lu fa'lun fau'lu fa'lun

Ruxi chu mohat sabohi davlat, xati siyohat shabi muanbar.

(Its translation:

Alas, to shed folks blood your two eyes are shooting arrows and drawing daggers

The tender hair on your lips is a flavoring night).

All other examples are written by *Jami* himself. The number of all meters in the treatise is about 157.

Jami's bahrs and meters can be seen in the following table:

Table 1

№	Names of bahrs	Number of meters			
		Eight-foot meters	Six-foot meters	Four-foot meters	Total
1.	*Khazaj*	10 / 24 (meters of rubai)	14	4	52
2.	*Rajaz*	7	6	2	15
3.	*Ramal*	7	5	2	14

[16] Shams Qaysi Razi. *Al-Mu'jam*. / Prepared for publication by U.Toirov. – Adib Publishing House, Dushanbe, 1991. p.50.

[17] Shaykh Akhmad Khudoydod Tarazi. *Funun ul-Balogha*. / Prepared for publication by A.Hayitmetov. Khazina Publishing House, Tashkent, 1996. p.151.

[18] Zakhiriddin Muhammad Babur. Mukhtasar. / Prepared for publication by S.Hasanov. – Fan Publishing House, Tashkent, 1971. p.19.

[19] *Abu Abdullah Ja'far Muhammad Rudaki* (858 – 941) was the founder of Persian literature. Extracts from his poem *"Kalila and Dimna"* and more than 2,000 lines of verses have reached us. In his time, *Rudaki* was famous as *"Adam ush-Shu'ara"* ("Adam of poets").

[20] *Khaja Jamaliddin Salman Savaji* (1310 –1376) was a famous Persian poet. His poems *"Jamshid and Khurshid"* and *"Firoqnoma"* as well as a collection of 16.000 lines of verses have reached us.

4.	*Munsarih*	7	2	2	11
5.	*Muzori'*	8	4	-	12
6.	*Muqtazab*	2	-	4	6
7.	*Mujtass*	7	-	2	9
8.	*Sari'*	-	6	-	6
9.	*Jadid*	-	1	-	1
10.	*Qarib*	-	3	-	3
11.	*Xafif*	1	7	-	8
12	*Mushokil*	1	1	2	4
13.	*Mutaqorib*	7	2	- / Mutatavval	10
14.	*Mutadorik*	4	2	-	6
	Total	**85**	**53**	**19**	

The number of all meters in *Navoi*'s work is around 160, and like in *Jami*'s treatise, all examples are written by *Navoi* himself. Only in the part of treatise concerning folklore genres one example is from *Husain Baykara*[21] and one example is from *"Muhabbatnoma"*[22].

Navoi's bahrs and meters can be seen in the following table:

Table 2

№	Names of bahrs	Number of meters			
		Eight-foot meters	Six-foot meters	Four-foot meters	Total
1.	*Khazaj*	11 / 24 (meters of rubai)	10	1	46
2.	*Rajaz*	6	6	1	13
3.	*Ramal*	7	4	2	13
4.	*Munsarih*	8	3	2	13
5.	*Muzori'*	8	5	-	13
6.	*Muqtazab*	2	1	4	7
7.	*Mujtass*	7	1	2	10
8.	*Sari'*	-	6	-	6
9.	*Jadid*	-	2	-	2
10.	*Qarib*	-	4	-	4
11.	*Xafif*	-	6	-	6
12	*Mushokil*	1	2	2	5
13.	*Mutaqorib*	8	2	- / Mutatavval	10
14.	*Mutadorik*	4	3	-	7
15.	*Komil*	1	-	-	1
16.	*Vofir*	1	-	-	1
17.	*Tavil*	1	-	-	1
18.	*Madid*	1	-	-	1
19	*Basit*	1	-	-	1
	Total	**91**	**55**	**14**	**160**

Thus, comparative analysis of *"Mezan ul-Avzan"* by *Alisher Navoi* and *"Risala-i Aruz"* by *Abdurakhman Jami* enables us to draw the following conclusions:

ANALYSIS:

"Risala-i Aruz" by Jami served as the primary source for the work of *Alisher Navoi*, who made use of various sources on *aruz* in Persian-Tajik literature [7, p.78].

The purpose of *Alisher Navoi* was to analyse more completly *bahrs*, *rukns*, *wazns* (meters) and *doiras* (circles). *Jami* concentrated more on *bahrs* and

[21] *Husayn Baykara* (1438 –1506) was a descendant of *Tamerlane*, the ruler of *Khorasan* from 1469 to 1506. He wrote some poetry as well. His *"Risala"* written in prose (1486) and a collection of poetry have reached us.

[22] *"Muhabbatnoma"* is a poem written by *Khorazmi*, a poet who lived in the 14th c. Written in 1353/54 and consisting of eleven *nomas* – letters written by a lover to his beloved one, this poem was devoted to *Muhammad Khujabek*, a nobleman from the court of *Jonibekkhon*, the ruler of the Golden Horde from 1342 to 1375.

doiras actual in his time, as *"Al-Mu'jam"* by *Shams Qays Razi*, *"Me'yor ul-Ash'or"* by *Nasiriddin Tusi* [8, p. 31-34] and *"Jami'i Mukhtasar"* by *Vakhid Tabrizi* created before *Jami* were also devoted to *aruz* studies in Persian-Tajik literature.

Both authors had similar opinions on the units of *aruz – juzv*, *zihof* and *furu'*. Both *Navoi* and *Jami* bring 6 *juzvs*, 45 *zihofs* and 60 *furu's*.

Abdurakhman Jami describes four doiras and mostly considered contemporary *aruz* in *"Al-Mu'jam"*, in particular. *Alisher Navoi* adds three more doiras and starts the tradition of poetry writing in two devices – *komil* in *"Doirai Mukhtalita"* and *tawil* in *"Doirai Mushtahiba"*, described by him as *matbu'* (pleasant).

RECOMMENDATIONS:

The fact that many poems in *Navoi*'s collection *"Khazoin ul-Ma'oni"* were written in these doira devices and many poets after Navoi – *Munis Khorazmi*[23], *Ogahi*[24], *Uvaysi*[25], *Fazli*[26] and others used them in their poetry writing proves the fact that these doiras are convenient for poetry writing purposes in the Turkic language.

Abdurakhman Jami describes 14 *bahrs* and about 150 meters in his work *"Risala-i Aruz"*, while *Navoi* analyses and illustrates 19 *bahrs* and 160 meters in his work *"Mezan ul-Avzan"*.

Both writers referred to their own poetry while illustrating and explaining *aruz* system, which shows that both of them were not only theoreticians, but also practitioners of *aruz* studies.

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[23] *Shermuhammad Munis Khorazmi* (1778 – 1829) was an Uzbek poet, historian and hydrologist, well known for his collection of poetry *"Munis ul-ushshoq"*, a historical work *"Firdaws ul-Iqbal"* and translations from *"Ravzat us-Safa"* by *Mirkhand*.

[24] *Muhammad Reza Ogahi* (1809 – 1874) was an Uzbek poet, historian, translator and hydrologist, the nephew of *Munis Khorazmi*. He ranks second after *Alisher Navoi* in Uzbek literature by the number of works he created. His collection of poetry *"Ta'viz ul-Ashiqin"*, 6 historical works and 19 translations have reached us.

[25] *Jahanatin Uvaysi* (1789/90 – 1850) was an Uzbek poetess. Her collection of poetry and three poems – *"Chronicles of Muhammad Alikhon"* (uncompleted), *"Prince Hasan"* and *"Prince Husayn"* have reached us.

[26] *Fazli Namangani* was one of the leading poets of Kokand literary circle. He served in the court of the ruler of Kokand *Amir Umarkhan* (1787 – 1822) and created an anthology *"Majmua-i Shairan"* by the order of *Umarkhan*.

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SECTION 25. Technologies of materials for the light and textile industry

QR – Issue QR – Article

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THE RELEVANCE OF THE STUDY OF VIOLATIONS OF POSTURE OF CHILDREN'S POPULATION OF GEORGIA

Abstract: *The purpose of the study was the detection of violations of posture of children's population of Georgia. To match our purpose an anthropomorphological study of children of primary and secondary school age and adolescents was conducted. Our study revealed that the violations of posture are more frequent in children at age of 6 to 13 years. Timely detection of the problem is of great importance for the prevention of further complications and scoliosis, today's most common disease in the world. As a result of the study the cases of violations of posture were determined and their quantitative characteristics were identified. Received data suggests the need for a mass anthropomorphological study of the children's population of Georgia. The results of the study will be used to design corrective means in order to eliminate violations of posture.*

Key words: *posture, anthropomorphological study, chuldren's population, scoliosis.*

Language: *Russian*

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АКТУАЛЬНОСТЬ ИССЛЕДОВАНИЯ НАРУШЕНИЙ ОСАНКИ ДЕТСКОГО НАСЕЛЕНИЯ ГРУЗИИ

Аннотация: *Целью нашего исследование было выявление случаев нарушения осанки детского населения Грузии. Для решения поставленных задач проводилось антропоморфологическое исследование детей младшего и старшего школьного возраста и подростков. Исследование показало, что нарушение осанки наиболее выражено у детей младшего школьного возраста от 6 до 13 лет. Соответственно, своевременное выявление проблемы имеет большое значение для предотвращение дальнейших осложнений и профилактики сколиоза, на сегодняшний день самого распространенного заболевания в мире. В результате исследования были выявлены случаи нарушения осанки детей и определены их количественные показатели. Полученные данные указывают на необходимость проведения массового антропоморфологического исследования детского населения Грузии. Итоги исследования будут использованы для проектирования корректирующих средств с целью устранения нарушений осанки.*

Ключевые слова: *осанка, антропоморфологическое исследование, детское население, сколиоз.*

Введение

Как известно, в мире активно происходит процесс акселерации населения, что особое влияние оказывает на физическое развитие детского организма. Процесс развития детского организма отличается от развития взрослого человека по ряду анатомо-физиологических особенностей [1, 2]. Во время роста ребенка происходят изменения телосложения, пропорций организма, что часто приводит к нарушениям осанки. Кроме того, что хорошая осанка создает приятное впечатление на окружающих, она является источником здоровья.

Причины нарушения осанки детей могут быть как врожденными, так и приобретёнными. Также выделяют такие социальные факторы, как:

- Малоподвижный образ жизни;
- Неудобная мебель, несоответствующая росту ребенка;
- Недостаточное освещение рабочего стола;
- Ношение рюкзака на одном плече, либо использование сумки или пакета.

При всех вышеперечисленных ситуациях происходит фиксация неправильного положения тела, а через определенный период времени это переходит в привычку.

Неправильная осанка у детей процессе формирования организма вызывает ряд нарушений, в часности нарушается нормальное кровообращения, происходит ухудшение памяти, развивается быстрая утомляемость, появляются боли в области позвоночника, ребенку тяжело долго сидеть и т.д. К сожалению, родители большое внимание уделяют питанию и образованию детей, а о нарушении осанки в школьном возрасте они узнают от врача тогда, когда проблема уже сформирована.

По статистике установлено, что в мире на сегодняшний день у 80-85% детей от 6 до 13 лет выявлены разные виды нарушений осанки [3]. Статистика настораживает и создает необходимость своевременного выявления проблемы и применения корректирующих средств для профилактики сколиоза [4].

Для решения вышесказанной проблемы имеет большое значение антропоморфологическое исследование детского населения Грузии, которое в нашей стране в последний раз проводилось в 80х годах прошедшего столетия [5,6,7,8]. Тогда как периодичность проведения таких исследований составляет 10 лет. Это тот период, в течение которого меняются размерные признаки фигуры, что обусловлено процессом акселерации, социоэкономическим уровнем жизни и изменениями физического развития детей. Проблема актуальна и имеет государственную значимость [9]. На это указывает тот факт, что в ряде стран Европы регулярно выделяются средства для проведения масштабного антропометрического исследования населения.

Целью проведенных исследований было выявления типов нарушений осанки и определение их процентных показателей в разных возрастных группах детей в результате антроморфологических исследований детей в одном из регионов Грузии-Имерети. Результаты проведенных в Грузии антропоморфологических исследований показали, что количественный показатель нарушения осанки у детей разной возрастной группы составляет – 44% для детей младшего школьного возраста, 34% для детей старшего школьного возраста, 28% для подростков (рис. 1а, б, в)

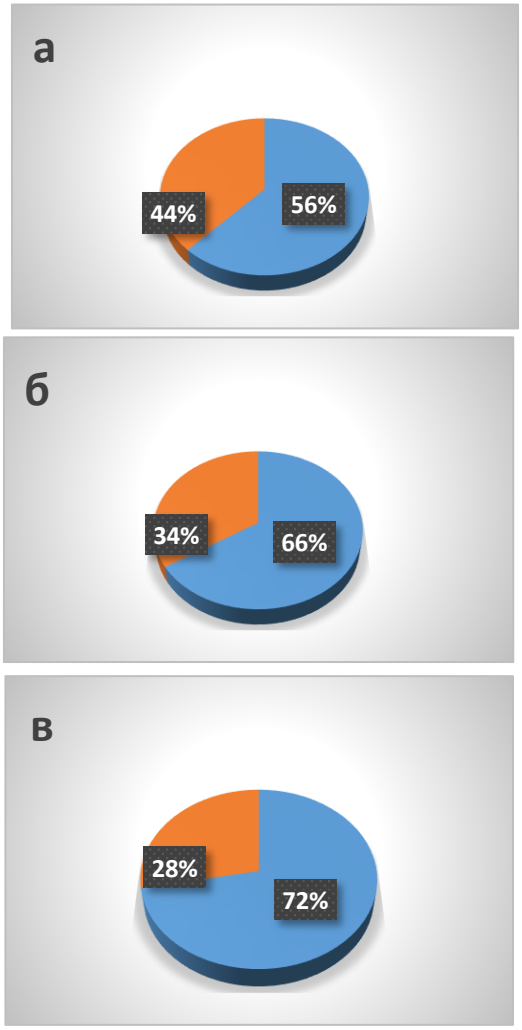

Рисунок 1 - Количественные показатели нарушения осанки: а – дети младшего школьного возраста, б – дети старшего школьного возраста, в - подростки

Во время исследования рассматривались 3 типа нарушений осанки у детей: сутулая спина, неровность плеч и выпрямленная спина. Результаты исследования (рис. 2,3,4) показали, что среди типов нарушения осанки наиболее часто встречалась «Сутулая спина», количественный показатель которой распределился по возрастным группам следующим образом: у детей младшего школьного возраста - 21%, старшеклассников 21% и у подростков 14%.

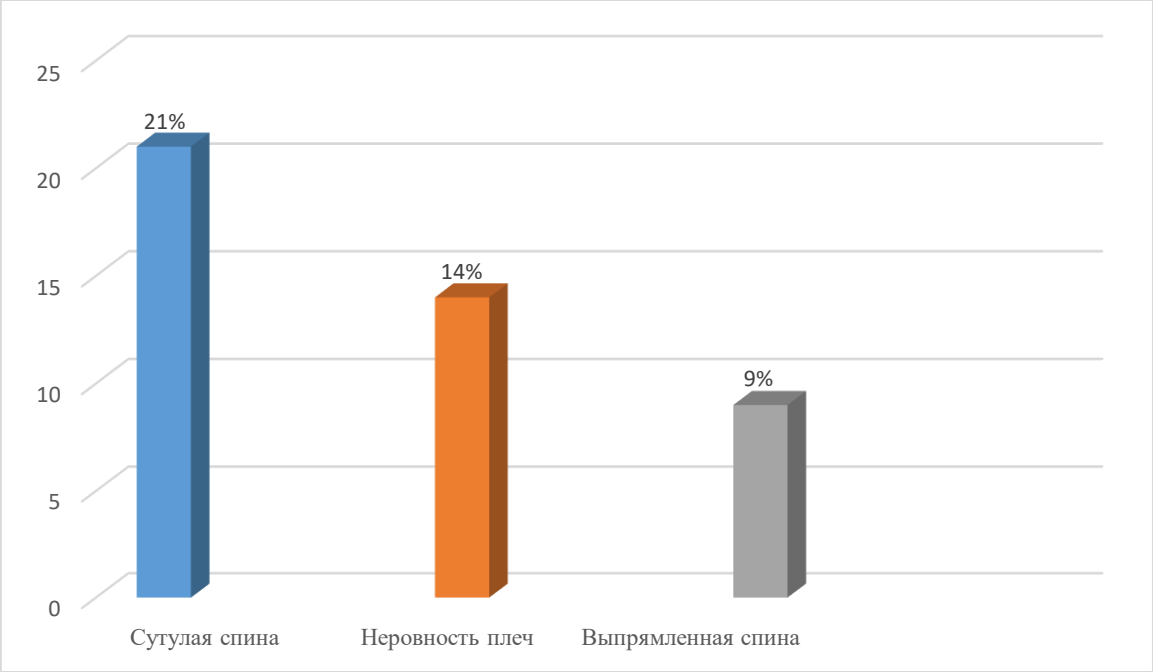

Рисунок 2 - Итоги определения типов нарушения осанки у детей младшего школьного возраста

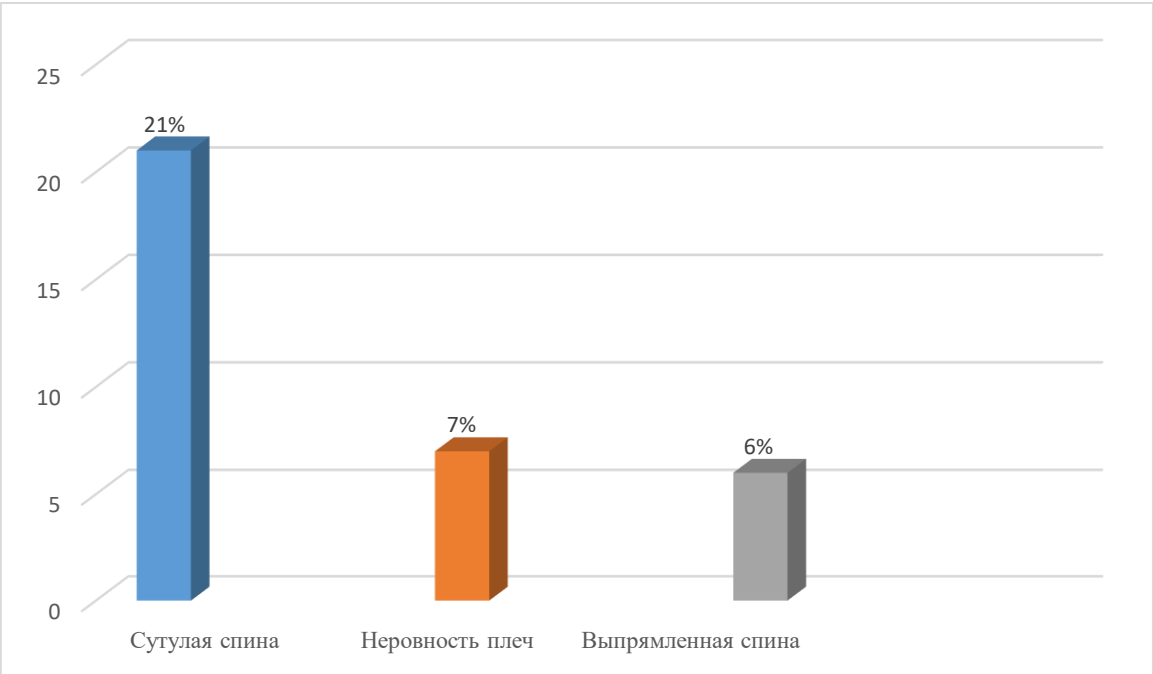

Рисунок 3 - Итоги определения типов нарушения осанки у детей старшего школьного возраста

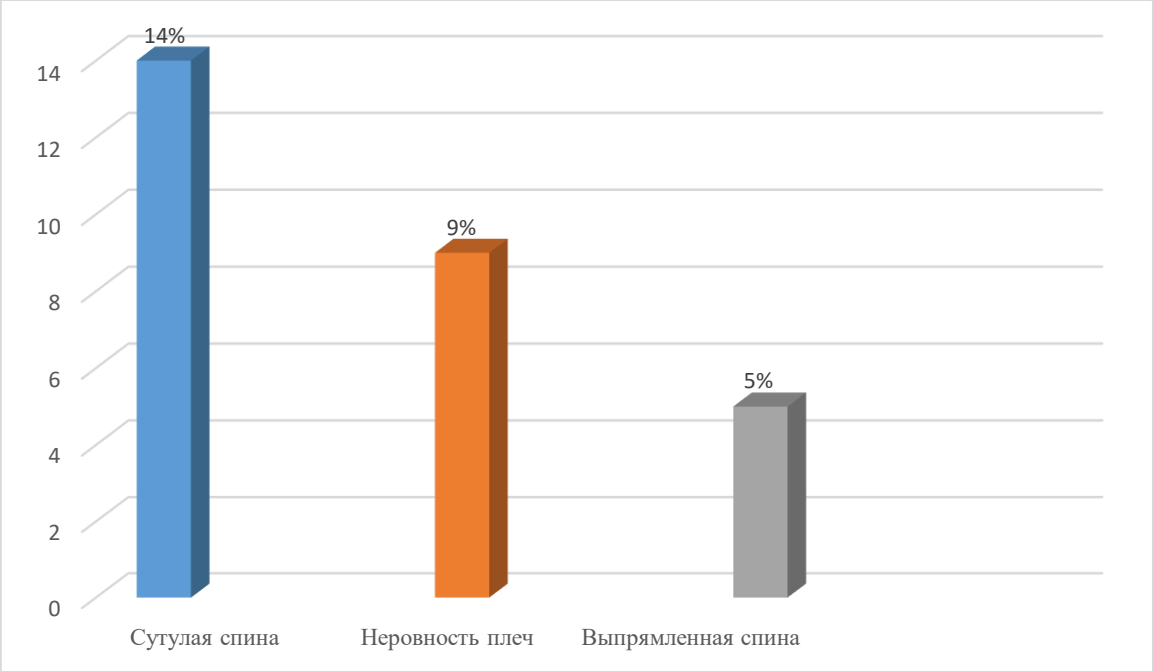

Рисунок 4 - Итоги определения типов нарушения осанки у детей подросткового возраста

Проведенные антропометрические исследования детей в регионе Имерети показали, что особенно часто встречаются случаи нарушения осанки у детей в возрасте от 6 до 13 лет. Таким образом выявилась необходимость проведения массовых антропоморфологических исследований детей по всей Грузии для своевременного выявления и устранения проблемы путем проведения соответствующих мероприятий.

Как известно, одной из множества причин нарушения осанки является одежда, несоответствующая по форме и размеру тело ребенка. Такая одежда может вызвать замедление процесса роста, нарушение функции внутренних органов и изменения осанки- отклонение от нормального состояния. На сегодняшний день в Грузии детское население снабжается одеждой иностранного производства, которая не предусматривает особенности антропометрических данных детского населения Грузии. Одежда не соответствует размеру и пропорциям детских фигур. К тому же как известно, в мире происходит ярко выраженный процесс акселерации детского населения, который вносит значительные изменения в размерной типологии [10]. Этот вопрос особенно проблематичен в Грузии, так как антропометрические исследования не проводились почти 40 лет, а существующие стандарты уже устаревшие.

Для устранения нарушения осанки детей большое значение имеют корректирующие средства. Существующие модели имеют ряд недостатков. Они не предусматривают антропометрических и морфологических данных детей конкретного региона, в нашем случае Грузии.

Заключение

Из вышесказанного следует заключить, что вопрос весьма актуален. При проведении массовых антропоморфологических исследований детского населения Грузии будет возможность установить случаи нарушений осанки, определить их виды и количественные показатели, что имеет большое значение для предотвращение дальнейших осложнений и профилактики сколиоза, что в свою очередь послужит основой для разработки корректирующих средств осанки и размерной типологии детей для отдельных поло-возрастных групп.

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