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SPECIFIC FACTORS OF COMPREHENSIVE STUDY AND ANALYSIS OF THE HISTORY AND CULTURE OF THE UZBEK PEOPLE.

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Annotation: We must master the concept of fine arts without lagging behind its modern examples, share it with students and young people, and, of course, solving this problem is a responsible task for the science of pedagogy. In this context, attention should be paid to the scientific study of the theoretical foundations of fine arts, including the problems and requirements of the pedagogy of fine arts.

Key words: spirituality, scientific pedagogy, symmetry, asymmetry, harmony of colors, composition, ancient art, silhouette, illustration.

Since gaining its independence, the Republic of Uzbekistan has made great strides in all areas and is making progress in all areas. Great work has been done in the fields of art, science and education, as well as in many other areas. In particular, great work is being done in the field of folk crafts and ceramics. Tax incentives for national craftsmen were also considered at the national level.

The National Program of Personnel Training raises the issue of training competitive, highly qualified personnel who meet high moral and ethical standards and raise their quality to international standards.

It is very important to comprehensively study and analyze the history and culture of the Uzbek people.

Today we have such a historic opportunity, said the second President Sh. Mirziyoyev, - we must critically evaluate our path, determine the foundations of our national statehood, return to the roots of our great culture, our ancient heritage and apply the rich traditions of the past to build a new society! Therefore, the work of each representative of the industry is aimed at young people to analyze and interpret the new works of our ancient and modern artists. On this basis, it is necessary to focus on the creation of thematic compositions in painting. The concept of fine arts has its own purpose and reasons for addressing the scientific essence of the types and genres in the theoretical issues of fine arts in education.

First of all, it should be noted that this issue has not been studied and interpreted in detail in terms of scientific pedagogy, especially in the Uzbek language. Therefore, many representatives of science, our intellectuals, including educators, do not have the knowledge to distinguish the types, genres and specific forms of fine arts. This is especially true for our fine arts teachers and educators.

In general, the problems of art history and art criticism are one of the most important and topical issues in the training of teachers in almost all fields. We see that serious attention is paid to this area in developed foreign countries.

There are scientifically based aspects of education in America, and it is worthwhile to cite an example of such evidence relevant to our topic. "In addition to the core subjects they have chosen, future teachers will also study subjects such as teaching methods, educational psychology, music, and art history." It goes without saying that in the United States, one of the most advanced countries, almost all science teachers are trained in art history. The issue of teacher training in fine arts in Uzbekistan cannot be ignored. The saddest thing is that even in the Institute of Art Studies,

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the types and genres of fine arts do not have a special pedagogical study of the problems of composition, the basics of the theory of art education. Therefore, there is no scientific literature in our country, especially in Uzbek. When it comes to the scientific study of this content of pedagogical science, it is impossible for teachers of fine arts to conduct education in this area without perfect theoretical knowledge.

Every nation has made its contribution to the development of world art. In return for new creative research, works of art are emerging.

Peoples, nations, as well as the art of the epochs merge and evolve, creating unique patterns. That is why new trends, directions and styles are being formed in art.

We need to master the concept of fine arts without lagging behind its modern examples, and share it with students and young people. Naturally, solving this problem is a responsible task for the science of pedagogy. In this regard, attention is paid to the scientific study of the theoretical foundations of fine arts, including the problems and requirements of the pedagogy of fine arts.

As a result of the development of culture, as the spiritual ties between nations develop, the demand for art is increasing day by day.

It is well known that as the general spirituality increases, the sense of consumption for art increases. As a simple example of this, let's take a look at how colorful objects and items in markets and retail stores are decorated with colorful images.

All this is the result of hard work and creative work of representatives of the fine arts. In fact, we face the work of artists every day, every step of the way. But almost not many are well aware of many aspects of the work of these artists.

Thus, the fact that people strive to make everything and things that are widely used in people's daily lives elegant and beautiful is itself a sufficient proof of the necessity of this subject.

It is expedient to approach the issue of scientific and pedagogical interpretation of theoretical knowledge in the field of fine arts through the analysis of the concept of fine arts itself.

The skillful execution and rhythm of any work, thing, object, etc., by human beings means that human labor is done artistically. This means that the educator's careful, beautiful, flawless performance of his work is an example of fine art.

Works created by artists, sculptors, architects, potters, composers, writers and other artists are, without a doubt, works of art. A work of fine art, in any form, manifests itself as a spiritual beauty, a virtue that affects the feelings and psyche of people.

Every artist is uniquely sought after and works differently. That is why there are specific types of art.

There are literature, music, theater, cinema, circus, architecture, fine, applied decoration and other arts.

Mankind has always expressed practical, creative work and theoretical ideas about the concept of fine arts. Our goal is to study them more deeply and thoroughly by analyzing and interpreting them all.

It also requires a serious study of the history of fine arts in Uzbekistan.

Scientific and theoretical, practical substantiation of guidelines for practical application of the oldest sculptures, their level of workmanship, ie the analysis of the possible methodological aspects of the complete specimens in these sculptures;

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	<b>Copyright (c) 2022 Author (s). This is an open-access article distributed under the terms of Creative Commons Attribution License(CCBY). To view a copy of this license, visit<a href="https://creativecommons.org/licenses/by/4.0/">https://creativecommons.org/licenses/by/4.0/</a></b>

Wide application in practice of works of applied art, as well as various other local materials, objects and objects that can be objects of art in the study of fine arts;

Problems such as the traditions of the past and the use of miniatures in books, the study of the secrets of fine arts in books, albums, the introduction of ideas about the advanced schools of each period into the pedagogical science of modern Uzbekistan are also relevant issues.

We quote the words of the European scholar José Ortega-y-Gasset, who expressed his objective opinion on the problem of fine arts and its new forms.

"There is a problem in the human heart, it is tragic. No matter what a person does, all his behavior is determined by this problem. They are all steps taken to solve this problem. This problem is so great that it is impossible to solve it at once, divide it into parts and rule over it." The first stage in the solution of the human problem is science, the second stage is morality, and art is an attempt to reach the most secret, the most honorable layer.

Indeed, so we see the urgency of a number of other tasks in the formation of art education and upbringing.

First, due to the current level of development in our society, a fair attitude to the various art mysteries and worldviews of the past, correct and radical scientific approaches have emerged. In this context, the visual arts and its historical examples play an important role in the comprehensive education of young people. It also encourages the study of the mysteries of art in all its aspects.

Second, it requires the ability to analyze and interpret the artistic value of works of fine art and to improve the content of education so that students have the knowledge of artistic perception, as well as the ability to distinguish works of art of excellent character.

Third, any work of art is a product of social thought, which largely reflects human values.

It is also important to achieve the full formation of the level of knowledge and understanding of future pedagogical artists in this context. It is well known that any art form has the laws of artistic maturity schools. The very existence of such laws is itself a key factor in the survival of the mysteries of art.

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PECULIARITIES OF THE SCIENTIFIC STUDY OF THE RELATIONSHIP BETWEEN COMPOSITION AND COLOR IN THE GENRE OF LANDSCAPE

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Annotation: As a result of the analysis and interpretation of the works of great artists in the creation of new thematic compositions in painting in the genres of fine arts, young prospective artists have discovered their own content and meaning. Teaching students how to scientifically substantiate the level of skillful use of a particular subject and the ability to fully comprehend the compositional content in it is focused on the context of the problem at hand.

Key words: Abstractionism, Xylography, Pointilism, Romanticism, Reflex, Realism, Rhythm, Proposition, Plainer, Plastic.

Fine art appeared in ancient times, as a result of the development of the labor process. In the process of labor, human thinking has developed, the sense of beauty has increased, the concepts of beauty, convenience and usefulness in reality have expanded. With the emergence of a class society, however, great changes took place in social development, and mental labor began to be separated from physical labor.

This played an important role in the development of science and fine arts. Professional art and artists appeared during this period. Art, on the other hand, has become a powerful ideological weapon, propagating the ideology of the ruling class, demonstrating its originality and class. Nevertheless, they created works that expressed their desires among the masses, their notions of beauty and selfishness, nobility and humanity.

The life, behavior and customs, achievements and defeats of the people are reflected in their works. Such art, which has existed in every epoch, depicts the beauties of life, develops in people high qualities and virtues, encourages them to strive for equality, freedom, brotherhood and a bright future. In fact, the cultural values created by mankind are not just ordinary riches, but a mirror that reflects the human intellect, thoughts about life.

Teaching the history of world art, understanding the laws of its development, getting acquainted with rare monuments, helps to enrich the feelings and life experiences of people of the past, a broader and more comprehensive approach to life. Types of fine arts include painting, architecture, graphics, sculpture.

One of the forms of social consciousness is that art is the artistic representation of events that have taken place, are taking place, and will take place in nature and society. The fine arts reflect the general state and development of the material world, are an important means of expressing it to people, and serve as a powerful factor in educating them politically, morally, and artistically. Art is divided into such types as fine arts, architecture, literature, music, circus, theater, cinema, radio and television, depending on the style and nature of expression in reality.

The most positive and important feature of the creation of a work of art in the genre of landscape art is that, unlike other disciplines, it represents events and phenomena not in concepts, but in forms perceived by the senses and emotions, in typical artistic images.

It is important to study and analyze the history, values, science and culture of Uzbekistan, the masterpieces of science and culture. "Today we have such a historic opportunity," said President

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Islam Karimov. We need to use them to build a new society.” To this end, a number of documents of the Government of the Republic are aimed at the development of our country on the basis of comprehensive world standards. In particular, in educating young people, great importance is attached to the use of our culture, universal values, examples of national art, wonderful works of art created by our ancestors and famous all over the world. Art, especially fine arts, as an integral part of the ideological, spiritual world during the period of independence, it can respond quickly to political and socio-economic changes in the life of the nation, as well as propaganda tools such as posters. continues as a result of his creative propaganda.

In the centuries-old fine arts of Uzbekistan, works of art created in the genre of landscape are a complex and multifaceted system of artistic imagery.

Like other fine arts, the landscape genre is constantly evolving. Scientific research on the psychological features of this genre is being carried out, enriching the history of fine arts with new information day by day.

In summary, the following points should be noted. Thanks to national independence, the people of Uzbekistan have chosen a unique path in the national spiritual and cultural renewal, and this process was initiated by our President Sh.M. Under Mirziyoyev's leadership, it continues in stages. The realization of such noble goals requires the establishment of a society based on democratic principles in our country, the development of the country, the formation of the ideology of national independence in the hearts and minds of young people.

Therefore, the creative layer of each society should care and care for the future of the younger generation, which is its successor.

The great works of art, cultural and educational heritage created by our ancestors can serve as a great educational school for our people, especially the younger generation. In this regard, in this master's dissertation work on the topic "Peculiarities of the scientific study of color relations in the genre of landscape" in the works of fine arts, a comprehensive study of the educational process, organized on the basis of new pedagogical technologies In their classes, students and young artists are invited to learn the art of enjoying nature, ecology, as well as the elements of nature that surround us, by creating works in this genre.

Despite the fact that works in the genre of landscape have reached a high level of art in the years of independence, to date, this art form and the work of master artists have not been scientifically studied in the classroom on the basis of advanced technological approaches. The lack of sources of theoretical information on this type of art in the classroom on the basis of new pedagogical approaches indicates the low level of scientific, creative, theoretical and practical significance of art. At the same time, it requires the introduction of scientific sources that cover a wide range of areas.

The relevance of the topic is also reflected in the fact that the ancient fine arts of the Uzbek people differ from each other in their diversity.

In these fine arts classes, “Peculiarities of the Scientific Study of Color Relations in the Landscape Genre” will be organized in such a way that it is fully responsive to modern students and young artists, with a broad approach to pedagogical technologies. Disclosure to students in the framework of the innovative-pedagogical technological process is a topical issue of the same master's dissertation.

From the above considerations, it is difficult to imagine the future of a great state without art institutions that testify to culture and spirituality. Therefore, as the first President IAKarimov rightly noted in his book "Uzbekistan on the threshold of the XXI century": "No society can imagine its future without developing and strengthening spiritual and moral values. ». So, since art institutions are a source of spirituality and culture, the effective use of educational processes in raising the spirituality, culture and art of our people is an urgent task today.

During his many years of pedagogical activity, he developed a perfect system of teaching in pencil and composition. The composition is a means of figurative depiction of life events, setting the principles for students to move from simple to complex sketches in a certain format. Later in the development of the basic principles of the theory, practice and methods of teaching composition, such great Russians as V. Favorsky, A. Deyneka, K. Yuon, E. Kibrik, A. Alpatov, G. Nissky, F. Reshetnikov, D. Shmarinov artists contributed.

Among them are K.Yuon, A. Deyneka, E. Kibrik, M. Alpatov's research on the abandoned creative and scientific theory deserves special mention.

Konstantin Yuon is another artist who made a significant contribution to the development of the theoretical foundations of composition.

Fine art, by virtue of its functional function, is the first to express its attitude to changes in society. The great works of fine arts and culture and a number of works of fine art dedicated to the composition of the landscape in the landscape genre are of great importance. After all, in the process of formation of national ideas and ideology, it has become a field of art that evokes love for nature.

The emergence of the landscape genre goes back a long way. The prevalence of landscape imagery can be seen in the example of ancient archeological excavations in the ancient East and the islands of Crete. For example, a prehistoric tombstone in Beni Hassan depicts a wild cat hunting scene. The genre of landscape appeared independently in China in the VI century, while in European art during the Renaissance it was formed on a scientific basis, that is, on the basis of linear and air (color) perspective.

One of the greatest gifts of Komoliddin Behzod is the vivid depiction of the spiritual image of our ancestors. In the process of studying the works of contemporary artists, our understanding of the concept of composition is enriched, and we get to know new aspects of the subject. When we talk about composition in the fine arts, we are referring to the works of leading artists who have created effective works in this area. Whether such artists create works in landscape or in any other genre, we will see how accurately the compositional solution was found in their memory. One of such artists is the People's Artist of Uzbekistan Ural Tansiqbaev. He is one of the most famous brush owners in the world. We see unique images in his works "Spring in Uzbekistan", "Irrigation of cotton", "Mountain village", "Evening", which are the result of many years of creative experience, knowledge and skills in creating works in the genre of landscape. The landscapes are described with great clarity, elegance and character. In it, the gentle breeze of the morning and the rushing water, the awakening of the cool nature are an effective means of evoking a joyful feeling in the viewer, and he has achieved such serious compositional success in creating similar images.<sup>1</sup>

<sup>1</sup> Abdimo'minov Muhammad Sodiq.Mag.diss.Namdu.Namangan.:2021.

People's artists of Uzbekistan Ural Tansiqbaev, N. Karakhan, R. Timirov, P. Benkov, A. Mirzayev, Z. Inogamov and many other artists who created in the genre of fine arts can give an example of their creative work. . Young art students will be able to see the unique content and meaning of the works of great artists in the creation of new thematic compositions in painting in landscape, still life, portrait and other genres of fine arts. The main task of the problem is to teach students how to scientifically substantiate the degree to which the colors in each work are skillfully used in accordance with their specific themes and to fully reveal the compositional content.

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**THE EMERGENCE OF SOME MODERN PROBLEMS IN THE FIELD OF ARCHITECTURE IN THE MODERN CONSTRUCTION OF ANCIENT CITIES RICH IN HISTORICAL MONUMENTS AND RELICS.**

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**Annotation:** *It is natural that some modern problems in the field of architecture arise in the modern construction of ancient cities rich in historical monuments, monuments, ancient, historical buildings with roofs, porches, magnificent, plaster, wood carving, tile, built in a way rich in majolica patterns, it is clear that the restoration of a simple, pattern-free, concrete-clad building next to it is incompatible with modern urban culture. A new architectural solution has been found in the construction of historical and modern buildings in Kokand.*

**Key words:** *ganch, wood carving, tiling, majolica patterns, mosque and madrasa, khanaqah, rhythm, symmetry, copper carving, jewelry, coppersmithing, carpentry, weaving, carving, pottery.*

A great state is built by a healthy generation, a healthy nation. It is necessary to do great things in life in order to bring up a healthy generation and a healthy nation. The creative, reconstruction and creative work carried out in our country and in the city of Kokand through the efforts of the head of our state Sh. Mirziyoyev is also aimed at this goal. It is known that half of the population of Kokand is young. That is why most of the new facilities being built in the city are science, culture, sports and art facilities that will help young people grow up as a healthy generation. One of them is the Children's Sports Complex. The complex was built at the expense of the Children's Sports Development Fund of Uzbekistan. The city also has a bowling alley, a chess school, a music school, a children's water park and playgrounds. All this shows that the city is creating great opportunities for young people. In recent years, attention has been paid to the construction of facilities in Kokand that will contribute to the development of science and education. Kokand embodies the best traditions of modern urban culture in the form of college buildings in the fields of medicine, transport, pedagogy, service and entrepreneurship, construction.

It is natural that some modern problems in the field of architecture arise in the modern construction of ancient cities rich in historical monuments. For example, if ancient, historical buildings are built with a roof, a porch, magnificent, rich in plaster, wood carving, tile, majolica patterns, the restoration of a simple, pattern-free, concrete-clad building next to it does not fit into modern urban culture clear A new architectural solution has been found in the construction of historical and modern buildings in Kokand.

It is known that the roofs of historical buildings in Kokand are majestic, decorated with colorful tiles, with open porches, carved and embossed columns, colorful ceilings and ceilings. These architectural styles are reflected in the modern look of new buildings. The arch in front of the Horde, the House of Ceremonies, the roofs and columns of the Palace of Culture are similar to the historical architectural traditions. The bowling alley, the porches of the chess school, and the wooden pillars are new forms of ancient architecture. Architecture is an important area of human social relations. The riches of architecture have been accumulated over the centuries, reworked and replenished by each generation and lived in public. The Uzbek people have the richest and most

ancient cultural heritage in Central Asia. Dozens of cultural and spiritual centers have left thousands of philosophical, literary, secular and scientific works as a legacy for the present generation. Prior to independence, our culture first developed in the spirit of analysis of Western culture under the pressure of the dominant ideology and oppressive regime. In the process of research on this dissertation, the main goal of the dissertation was the artistic, methodological and local specificity of the historical development of architectural decorations of the Kokand Khanate. The following conclusions were drawn from the results of this task:

First of all, Nodira, Dilshod, Zebuniso and other poets and poetesses emerged from the Kokand literary community, who constantly propagated the ideas of humanity and patriotism, and mourned the terrible oppressions of the time. Through their work, they instilled a sense of confidence that love, justice, and goodness would prevail. Our people today enjoy this literary heritage.

Second, in the 19th century, education in the Kokand khanate increased significantly. Religious primary schools and secondary and higher education madrassas were mainly attended by boys. Madrasa students studied in three stages.

Thirdly, in the cultural life, such forms of applied art as singing, dorboz, puppetry, acting, askiya, theatrical music and singing played an important role.

Fourth, calligraphy schools have developed in Kokand and Tashkent, and their role in cultural life is invaluable. The Kokand calligraphers had their own style and were different from any other calligrapher in the city.

Fifth, the Khanate paid special attention to architecture. Many mosques and madrasas, khanaqahs, qorihanas and schools have been built here. Some of them have survived. They are a masterpiece of khanate architecture. In the field of architecture, the decoration of madrassas is also unique.

Sixth, folk and applied arts such as wood and copper carving, weaving of various fabrics, jewelry, coppersmithing, carpentry, weaving, carving, pottery and other types also developed.

Seventh, the school of historiography, formed and developed in the literary environment of the Kokand Khanate, plays an important role in the spiritual life of the society living in these areas. In their works, Kokand historians have reflected the economic, social, political and cultural life of the people over the years. The spiritual and cultural life of the Kokand khanate was revived and valuable works were created. It was during this period that the first historical works were created in the literary environment of Kokand, and the traditional attitude to the science of history and historiography was revived and developed in new conditions.

As a general conclusion, under the influence of the literary environment created in the Kokand khanate, all aspects of the traditional cultural life of Central Asia experienced their growth over a period of time. Examples of spiritual and material culture created during this period as a result of the development of literature, architecture, historiography, folk arts and a number of other areas inherent in the culture of the peoples of Central Asia are still alive today. is a significant part of the invaluable spiritual heritage of the Uzbek people.

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**STRENGTH IN INDUSTRIAL AND MANUFACTURING ENTERPRISES  
INVESTIGATION OF TRANSFORMERS WORKING MODES.**

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**Annotation:** *The article deals with the analysis of loads of parallel working transformers, optimization of power transformer operating modes and study of operating transformer operating modes operating in different operating modes. The article discusses the issues of achieving energy savings through the automation of transformer substations of industrial enterprises using modern programmable logic controllers. Reliability decisions are made at each level of management of the development and functioning of electricity: in pre-design development, at all stages of power system design, installation of facilities, operation of power generation, operational and dispatch management, planning and regulatory, as well as regulatory other modes should be adopted in automated and automatic control, planning and carrying out repair work.*

**Key words:** *Power System, Electrical Equipment, Electricity, Generation, Remote Control, Relay Protection, Alarm, Automation, Recording, Voltage Change. P ower transformer, I dle mode, S hort circuit mode, load mode, P ower loss*

The power supply system of industrial enterprises will be built to provide electricity to consumers of enterprises. Consumers include those in the home; electric drives of various mechanisms, electric furnaces and electrothermal equipment, electrolytic punches, hardware and machines required for electric welding, lighting punches, electric filters and so on.

enterprises will be reduced and transmitted to consumers. The power supply scheme of an industrial enterprise should take into account the future development required by consumers, have minimal losses, allow for quick repairs and ensure low initial capital expenditures. Therefore, in the process of power supply design, several variants of the schemes are developed and the best technical and economic performance is adopted from them. Requirements for power supply are determined by the technological process and capacity of the enterprise . Depending on the installed capacity of consumers in the enterprise, they are divided into large (over 75 MW ) , medium ( 5-75 MW ) and small (up to 5 MW) facilities . Large and medium -sized enterprises are supplied with electricity from 35,110,220 and 330 kV substations , and small - capacity enterprises , in most cases , from 6.10 kV . Schemes with a single receiving point (BPP, MTP) are used in the power supply of small and medium-sized enterprises . Such a scheme is used at voltages of 6, 10 and 20 kV and when the enterprise is 5-10 km away from the power system . Shown If the power supply is interrupted on one of the lines, the supply is automatically restored to the second line using an intersection switch . In this case , there are transformers between the external and internal circuits , and the system voltage is reduced to 6-20 kV. The power of the transformers and the cross-sections of the line wires are obtained so that they operate in normal mode with a load of 60-70% . When one line and transformer are disconnected, the second line and transformer operate with permissible overload and ensure uninterrupted operation of the enterprise. The use of disconnectors and q is q a

connectors instead of a circuit breaker on the high-voltage side of the BPP leads to a considerable reduction in the power circuit q .

When a transformer is damaged, the short circuit is triggered by the relay protection and an artificial T mode occurs . As a result , the circuit breaker at the head of the line is disconnected and the automatic reconnection (AC ) system is activated.

During a “non-toxic” break in the line, the disconnector R extends the damaged transformer. The AKU system reconnects the line after a “non-toxic” pause and q ti is complete, and the undamaged transformer is connected to the source. Medium and large power plants receive most of their electricity through high - voltage power lines . The inward power supply circuit is minimal In the range of devices and circuits of transformers is understood as circuits that have a voltage of e and maximize the high voltage (35, 110, 220,330 kV ) to electrical installations .

We determine the optimal operating modes of two TM-1000/10 transformers installed at the shop transformer substation supplying electricity to the industrial enterprise. It is known that while ensuring the operation of power transformers n at the same time at the minimum value of power losses, it is necessary to take into account the active power losses in the power supply system, as additional active power losses as a result of reactive power consumption of the transformer from power plant generators to transformers occurs.

Power losses in transformers (including power supply losses)

$$\Delta P_T = \Delta P_X + K_3 \Delta P_K, (1)$$

where  $\Delta P_X = \Delta P_X + K_{H.II} \Delta Q_X$  – the power dissipation of the transformer is given in the

salt operating mode;  $K_Z$  - load factor of the transformer;  $\Delta P_K = \Delta P_K + K_{H.II} \Delta Q_K$  – the specified power dissipation in the short-circuit operation mode of the transformer;  $K_{I.P.}$  - coefficient of variation of wastes.

The description of the dependence of the load losses of transformers on the change in load capacity S is given in Figure 1: Figure 1 - description  $\Delta P_T = f(S_H)$  , when one transformer is operating, and description 2 - when the second transformer is operating. The load-dependent variation of the power losses reported during the simultaneous operation of both transformers is represented by Description 3.

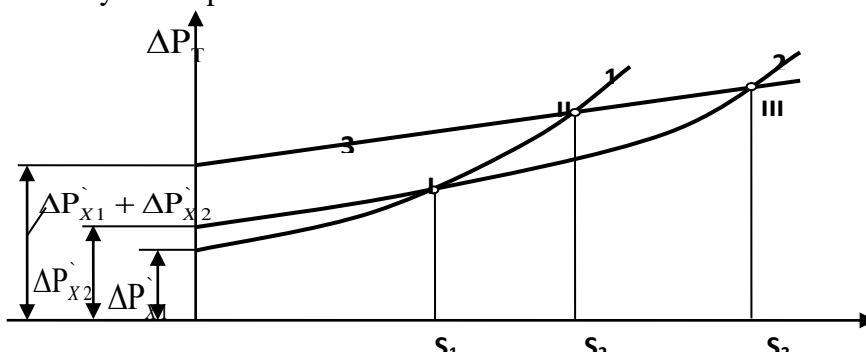




Figure 1. Described the dependence of the active power losses of transformers on the change  $\Delta P_T$  in load  $S_n$

Equation (2) can be written as follows:

$$\Delta P_T = \Delta P_X + \frac{\Delta P_K}{S_{HOM.T}^2} S_H^2, (2)$$

where the  $S_{HOM.T}$  – rated power of the transformer .

We accept the following definitions:  $\Delta P_X = a; \Delta P_K / S_{HOM.T}^2 = b$ .

Then 
$$\Delta P_T = a + bS_H^2. (3)$$

The intersection of the calculated parabolic equations descriptions I , II and III (see Figure 1) and these points  $S_1, S_2, S_3$  of the load, respectively, corresponds to the values of These coordinates are the joint solutions of the equations, representing the power losses during the alternating and simultaneous operation of the transformers, and allowing to determine at which load values one transformer is operating, the other is connected, and finally the three transformers are connected. The indices in the equations correspond to the descriptions in the figure above.

equation  $\Delta P_{T1} = \Delta P_{T2}$ , then:

$$S_{H1} = \sqrt{(a_2 - a_1)(b_1 - b_2)}, (4)$$

where  $S_{H1}$  – the load power for the case where the power loss of the first transformer is equal to the power loss of the second transformer (point  $S_1$  in the figure ).

For  $n$  transformers of the same power

$$S_{H1} = S_{HOM.T} \sqrt{n(n-1) \Delta P_X / \Delta P_K}. (5)$$

1 corresponding to point  $1$  can be determined graphically or analytically. When the load value is less than  $S_1$ , the operation of a transformer is economically feasible, and its power dissipation corresponds to characteristic 1. With a load value of up to  $S_2$ , it is preferable that a second transformer with an economically acceptable capacity greater than the first is operated. When the load value is greater than  $S_2$ , both transformers will need to operate.

(5) can be used to determine the parallel operation of two or more transformers in low-cost mode using the expression; it is also possible to determine how cost-effective it would be to add an additional single transformer to a group of operating transformers.

**Analysis of loads of transformers operating in parallel** . The use of multiple transformers connected to a single load is called parallel operation of transformers. In transformer substations, the load varies continuously over time, depending on the amount and capacity of electricity consumers : at night it is minimal, during the day or evening it is maximum, and if such a load is overloaded, one transformer can fail. To prevent this, a second transformer is connected in parallel to it, in which the load is distributed between them.

When transformers have the same number of phases, the voltages of the primary and secondary windings and, consequently, the transformation coefficients on the voltage are also the same; connecting groups of coils; the short - circuit voltage is the same (the difference is allowed to be no more than  $\pm 10\%$ ); when the current frequency is the same; can operate in parallel when the rated power does not exceed the 3: 1 limit. When the second and third conditions are violated, equalizing currents are generated in the windings of transformers connected in parallel. If the fourth condition is violated, the load between the transformers connected in parallel is not distributed proportionally to their rated power. In order to connect transformers that meet the listed conditions to operate in parallel, it is necessary to check that their parts are properly marked under low voltage. To do this, the high-voltage winding of a three-phase transformer is connected in a star mode (Fig. 2, see *a* ),  $VYq$  is given a low-voltage single-phase alternating current relative to the rated phase voltage, then between the parts of the transformer  $U_{BY}, e_{AX}, e_{CZ}, e_{AC}, U_{AB}$  and  $U_a$  vs voltage and  $E_{YUK}$  are measured with a voltmeter. A full magnetic flux passes through the middle rod of phase V, half of it passes through the end rods of phase A and C transformers, and the number of windings in all phases is the same. Therefore, the voltmeter, if its parts are correctly marked,  $AX$  and  $SZ$ , show the voltage between the parts, i.e., the voltage equal to half the voltage applied to the  $VY$  coil.

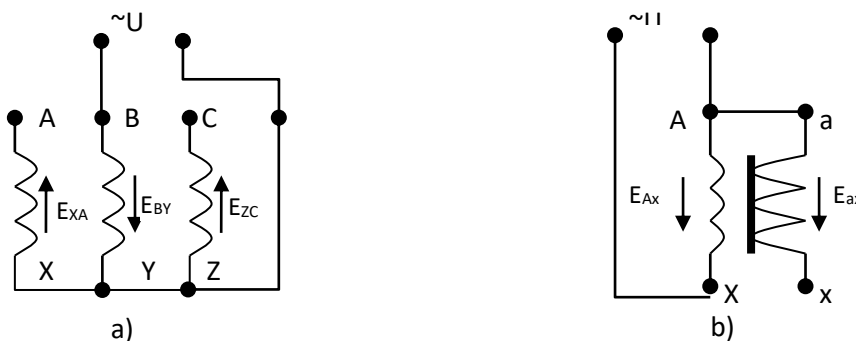


Figure 2 Check that the parts of the two-phase three-phase transformer windings are correctly marked: *a* - high voltage, *b* - low voltage .

Voltage  $U_{AB} = U_{VS} = 1.5 U_{VY}$  . If the coils are incorrectly marked, the reading of the voltmeter is determined by the difference of  $E_{YUK}$ s, i.e.  $U_{AB} = 0.5 U_{BY}$  A phase marking must be changed. The marking of the low-voltage windings is checked sequentially for each phase according to the scheme shown in Figure 3, b.

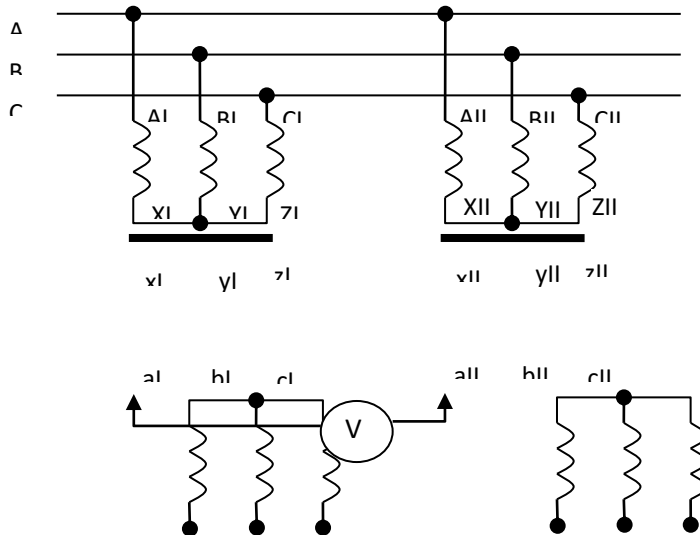


Figure 3 Connecting two three-phase transformers Check the uniformity of the group h l a r i n g .

uniformity of the winding connection groups of two three-phase transformers is checked by measuring the voltage between the one-piece parts of these transformers (Fig. 3). Transformers belong to the same group if the voltage between the parts of the same name is zero and the voltage between the parts of the same name is the same and the line voltage is zero. will be.

All phase voltages of one transformer must be equal to h each phase voltage of the other transformer. If there is no such equation, the transformers belong to different groups and it is impossible to connect them to parallel operation, because the resulting rectifying current is greater than the short-circuit current, ie many times greater than the rated current.

elements of the power supply system of industrial enterprises are substations and cableways . Improper choice of power of transformers and shortcomings in their management have a significant impact on the amount of losses in the enterprise . The main disadvantages of this are the transformer Improper selection and installation of q power is h . In the present article, the issues of development of methodological recommendations on overcoming these shortcomings will be considered. To solve this task , limiting the salt operation of transformers and replacing low - load transformers with other low- power transformers or selecting different power transformers operating in parallel can give the expected result. We will consider the selection of different power transformers operating in parallel . In addition , strict regulation of the order of calculations requires the creation of an algorithm for the selection of criteria .

Initially, the nominal capacity of different power transformers operating in parallel at the substation is determined based on the number of transformers in stock of the enterprise and how the power density is distributed in the shops. Categories of electricity consumers are selected by loading coefficients. According to it,  $b = 0.65-0.75$  for Category 1 consumers,  $b = 0.75-0.85$  for

Category 2 consumers and  $b = 0.85-0.95$  for Category 3 consumers . The load factor of transformers is determined by the following expression:

$$\beta = \frac{S_{IOK}}{S_{HT1} + S_{HT2} + \dots} \quad (6)$$

Then the rated total power of the transformers does not exceed 3: 1

$n = 2$  - the number of transformers in the substation (this size is often equal to two) is found and a finally the number of transformers and the number of their phases are the same after the power is selected, the voltages of the primary and secondary windings and, consequently, the voltage transformation coefficients; connection methods and groups of coils; the short-circuit voltage is the same (the difference is allowed to be no more than  $\pm 10\%$ ); considering that the current frequency is the same, the transformers are finally selected. Figure 4 shows the algorithm for selecting different power transformers operating in parallel in transformer substations .

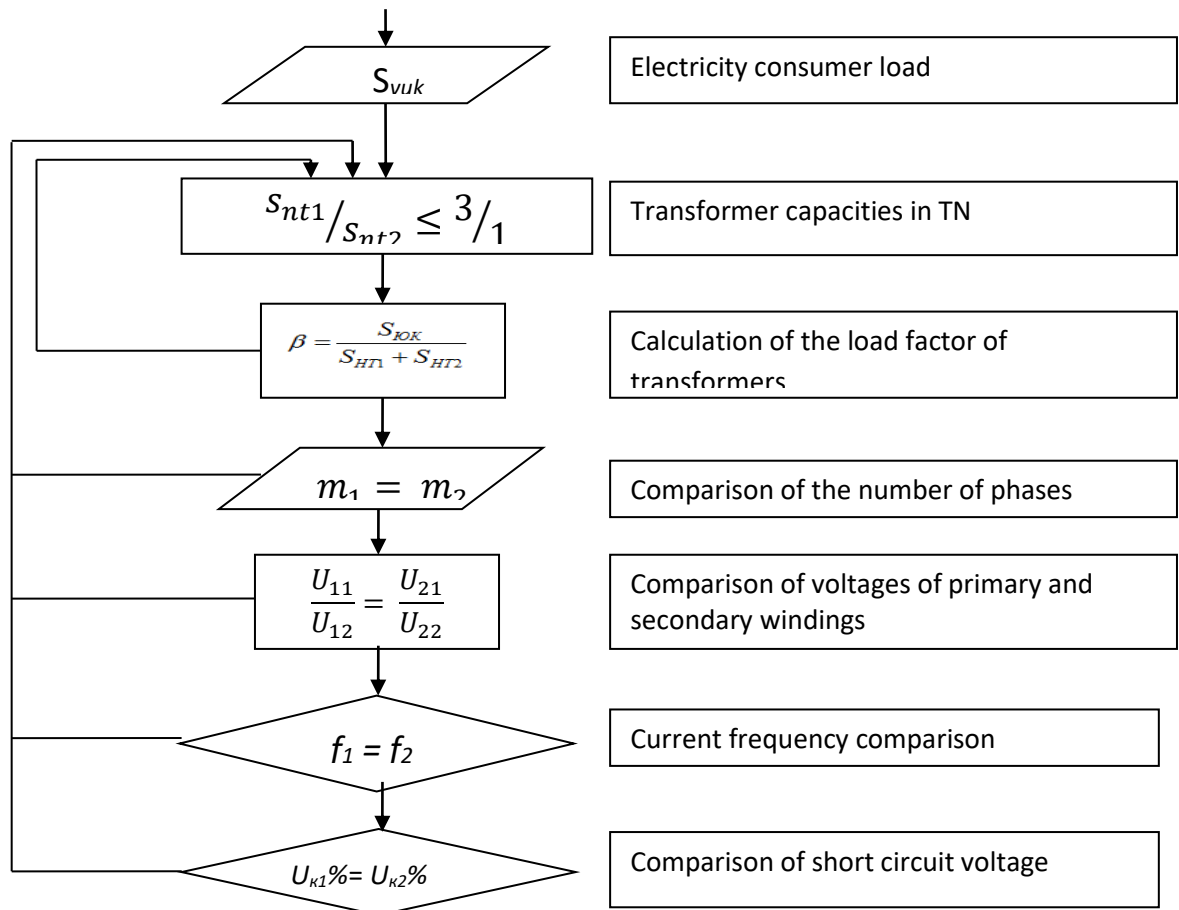


Figure 4 Algorithm for selection of power transformers of different power operating in parallel in transformer substations

Today, the objective laws of development of society require that the level of energy supply of labor is constantly growing. At the same time, many areas of technical development are aimed at increasing the efficiency of energy use in production, ie energy saving. Indeed, in the context of the current energy crisis, an additional but now the most important function placed on the power supply system is also the energy saving function. In solving these problems, the automated information system on energy saving allows to solve these problems on a scientific basis. Each decision is checked with analytical results in computer programs.

One of the effective ways to solve the problem of energy saving is the significant results in the organization of an operational monitoring service that shows the real consumption of electricity. To solve this problem, the selection of power transformers of different capacities operating in parallel in transformer substations provides optimization of power supply.

**Optimization of operating modes of power transformers** . During operation, it is necessary to ensure an economically rational mode of operation of the transformer. This means that the amount of active power losses in transformers and in the entire power supply system should be kept to a minimum. Such wastes are called quoted wastes and are defined by the following expression:

$$\Delta P'_T = \Delta P'_{c.u} + K_{\text{io}}^2 \cdot \Delta P'_{KT} \quad (7)$$

Here are  $\Delta P'_{cu} = \Delta P'_{cu} + K_y \Delta Q_{cu}$  the power wastes for the salt operating mode of the transformer ;  $\Delta P'_{km} = \Delta P'_{km} + K_y \Delta Q_{km}$  - power losses of the transformer for QT mode;  $K_o$  - coefficient of variation of wastes;  $\Delta P_{ssh}$  - active power dissipation in the unloaded state of the transformer (given in the references);  $\Delta P_{kg}$  - active power losses in short circuit mode (taken from references);

$$K_{\text{io}} = \frac{S_{\text{io}}}{S_{\text{hmn}}} \text{-loading co e ffi ts enti; } S_{\text{yu}} \text{ is the transformer load;}$$

$S_{\text{ntp}}$  is the power specified in the passport of the transformer ;

$$\Delta Q_{\kappa} = S_{\text{hmn}} \frac{I_{cu} \%}{100} \text{-reactive power in the operating mode of the transformer ;}$$

$$\Delta Q_{km} = S_{\text{hmn}} \frac{U_k \%}{100} \text{-reactive power in the short -circuit mode of the transformer ;}$$

$I_{cu} \%$  normal operation mode (given in the references);

$U_k \%$  - voltage of the transformer in short-circuit (T) mode (given in the references).

This relationship can be written as: The dependence of  $\Delta R'_t$  on the load change.

$$\Delta R'_t = \Delta R'_{s.i.} + [(\Delta R'_{t.}) / S^2_{\text{nom.t.}}] \cdot S^2_{\text{yu.}} \quad (8)$$

In order to simplify, we introduce the following definitions:

$$\Delta P'_{cu} = a; \quad \frac{\Delta P'_{KT}}{S^2_{\text{hmn}}} = b$$

In that case  $\Delta P_T' = a + bS_{10}^2$  (9)

we can draw a relationship between the amount of losses reported in the power supply system and the electrical load. Figure 5 shows the change graphs of active power losses in the case of transformers operating separately and in parallel.

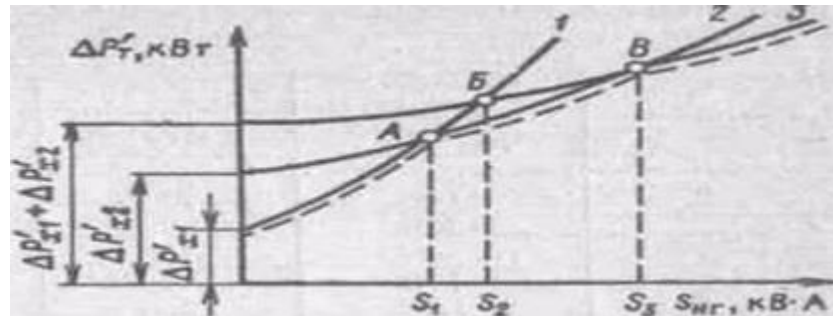


Figure 5. Active power losses in power transformers

**Conclusion.** Analysis of the given graphs shows that if the load is in the range  $0 \div S_1$ , the first transformer must be loaded, because in this case the specified active power losses of the first transformer will be minimal.

If the condition  $S_1 \leq S_{yu} \leq S_z$  is met, it is advisable to load the second transformer.

If  $S_{yu} > S_z$ , the amount of losses will be small when both transformers are connected in parallel and loaded.

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**SPECIFIC FEATURES OF THE PRESSURE ROLLER ROLLING ON THE DEFORMABLE SURFACE OF THE SEWED TISSUE WITH EMULSION.**

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**Annotation:** In article it is considered deformations rubber a roller, at various modes of sewing together of fabrics which puts additional with emulsion for seam strengthening. Also to be cited the settlement data of process taking into account friction factor, and properties of sewed materials.

**Key words:** clamping a roller, deformation, swings a roller, a conducted wheel, rigidity of rubber, loading on a roller.

When the pressure roller is rolling, deformation occurs simultaneously in three mutually perpendicular directions normal to the surface, across and longitudinally in relation to the plane of rotation of the pressure roller.

The first of these deformations characterizes tissue compaction, the second is the bulging of the tissue to the sides and the third is the displacement of the tissue in the direction of movement, which simultaneously accompanies the emulsion.

When the tissue is displaced in the direction of movement, both tissue compaction and squeezing out of the composite material, as well as its displacement, take place. The ratio of these types of deformations depends on the state of the fabric and the amount of emulsion between the layers of the fabric, the kinematics of the pressure roll, the width of the roll and the speed of the fabric. If it is impossible to seal, the emulsion of the tissue is squeezed up and to the sides.

When a highly deformable roller is rolling, the deformation of the fabric, in addition to its own characteristic, is greatly influenced by the rigidity of the roller rubber. So, with a sufficiently high rigidity of the rubber of the roller, its high normal rigidity, the cross-section of the track has the shape shown in Fig. 1.

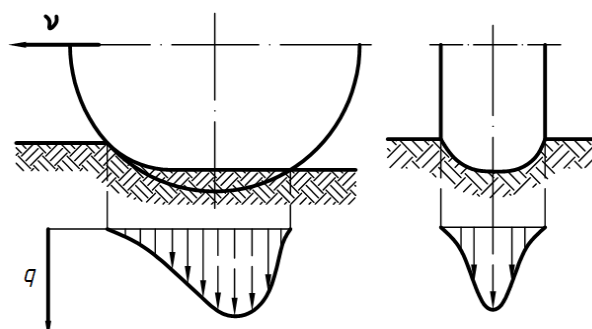


Fig. 1. Distribution of pressures in contact of the roller with the sewn fabric



The rolling resistance of a roller on a deformable fabric consists of the rolling resistance of the roller and the rolling resistance of the fabric.

Due to the complexity of determining the rolling resistance of the fabric of a deformable rubber roller, the rolling process of a rigid roller can be considered, which has a diameter larger than the deformable roller, but has an equivalent effect on the fabric [1].

The condition of equivalence is the coincidence of the curvature of the longitudinal section of the deformable and rigid roller in the contact plane. Then (Fig. 2, a) for these rollers the length of the half-chord is

$$AB = \sqrt{r_c^2 - [r_c - (h_r + h_{uz})]^2} = \sqrt{r_{\text{жс}} - (r_{\text{жс}} - h)^2}$$

Where  $h_{shg} = G_k / C_n$  — normal deformation of the rubber on the surface of the pressure roller;

$G_k$ - normal load on the pressure roller.

$C_n$ - hardness of rubber on the surface of the pressure roller.

$r_c, r_{\text{ж}}$  — correspondingly, the free radius of the deformable and rigid roller.

Transforming the obtained expression and neglecting the quantities of the second order of smallness, we obtain

$$r_{\text{жс}} = r_c \left( 1 + \frac{h_{uz}}{h_r} \right) \quad (1)$$

Let us turn to the rolling pattern of a rigid driven wheel (Fig. 2, b), which is equivalent in the mentioned sense to a deformable one.

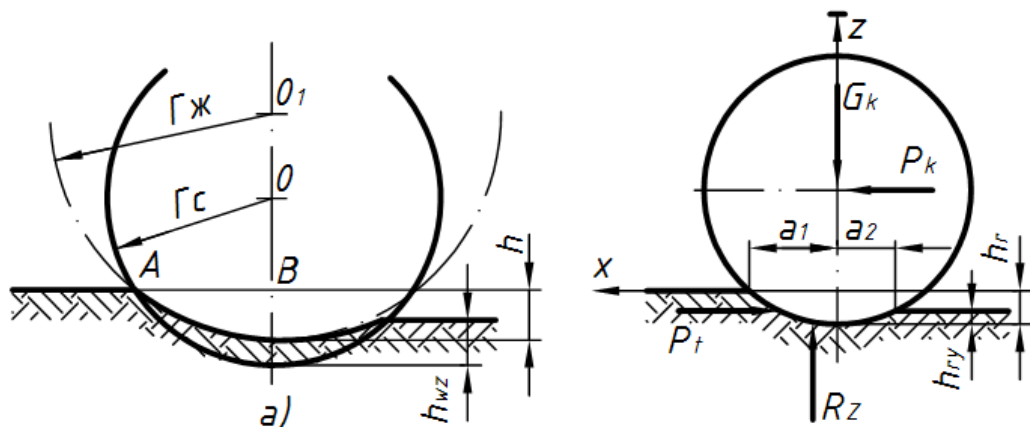


Fig. 2. Rolling wheel on deformable soil

Suppose that the wheel is moving at a low speed, so that on each elementary segment of the path, soil deformations, corresponding to the prolonged action of the load, have time to occur. When moving along the tissue, as in an elastically plastic medium, the roller in the front part at the loading area forms a track with a depth of  $h_g$ , and in the rear part, at the unloading area, a partial restoration of tissue deformation by the value of  $h_{hy}$  occurs.

The normal load of the  $G_k$  roller is balanced by the resistance of the fabric

$$G_k = \int_{a_1}^{a_2} p b dx$$

where  $b$  — roller width .

Applying dependence (1), we obtain

$$G_k = c_r b \int_{a_1}^{a_2} h^\mu dx. \quad (2).$$

Integrating expression (2) and assuming that  $c_r$  and  $\mu$  at the loading and unloading sections are the same, we obtain

$$G_k = c_r b \sqrt{2r_{\text{oc}}} \left(1 - \frac{\mu}{3}\right) \left(h^{\mu+\frac{1}{2}} + h_{ry}^{\mu+\frac{1}{2}}\right) \quad (3)$$

$c_r$  - material parameters, material settlement coefficient.

$\mu$  - coefficient for some fabrics.

For plastic fabrics 0.5, for elastic fabrics 0, and for thickening fabrics 1.

For the overwhelming majority of tissues, elastic deformations are significantly less than plastic ones. The resistance of the fabric to the rolling of the roller can be determined if the work spent on the formation of the track is known. As it was shown, when the roller rolls, complex deformations of the fabric occur.

Considering deformations only in the plane of a rectilinearly rolling roller, it can be assumed that the sum of all deformations of the fabric consists of deformations caused by the displacement of the points of the roller when the roller moves. Then the work expended by the roller on the formation of a rut (the work of rutting) is proportional to the displacement of point 1 of the roller rim in the fabric (Fig. 3), which in pure rolling occurs along the cycloid, and the force tangential to this trajectory.

Let there be an elementary platform in the vicinity of point 1 of the roller rim, which moves along the trajectory of this point and at some time is at a depth from  $(h_r - h)$  the entrance to the ground. Then the elementary force tangent to the trajectory of point 1 on the roller;

$$dP = p b dl$$

where  $b$ — the width of the platform, equal to the width of the roller;

( $dl$  — the projection of the length of the platform onto the plane perpendicular to the tangential force  $dP$ ).

Rutting work per wheel revolution

$$A_{f\text{o}\delta} = b \int_0^{2\pi} dl \int_0^s p ds \quad (4).$$

To find the second integral in expression (4), it is necessary to have an analytical dependence for the length of the cycloid, which is not available.

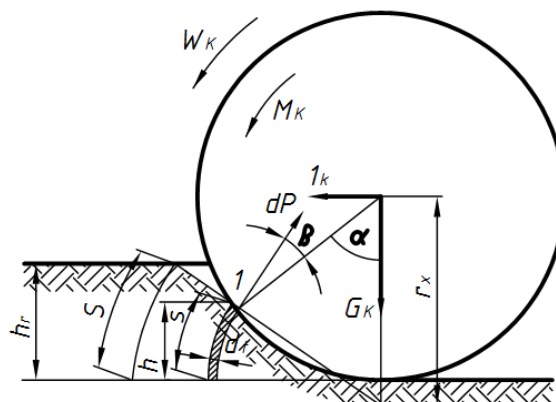


Fig. 3. Towards the definition of work on tissue deformation.

Calculations show that the solution of expression (3) using empirical formulas that determine the length of the cycloid in the studied area is not significantly more accurate than its solution under the assumption that the work of rutting is spent only on deformation of the tissue in normal to its surface direction. Therefore, with an accuracy sufficient for practice, the second integral can be

$\int_0^{h_r} p dh$  replace with, and then use one of the expressions

(1) - (3) and determine the work of  $A_{fob}$ .

Using, for example, the simplest expression (1), we obtain

$$A_{fob} = c_1 b 2\pi r_{kc} \int_0^{h_r} h^\mu dh = c_1 b 2\pi r_{kc} \frac{h_r^{\mu+1}}{\mu+1}$$

Hence, the resistance force of the fabric, rolling of the free roller is determined rolling resistance power

$$N_{fr}^c = P_{fr}^c v_m = c_r b \omega_k r_k h_r^{\mu+1} / (\mu+1)$$

and the coefficient of rolling resistance of the fabric

$$f_r = \frac{c_r b h_r^{\mu+1}}{G_k \mu+1} \quad (5)$$

The value of the roller track  $h_r$  required to determine the rolling resistance can be found from equation (3) with the substitution of the value  $r_j$  from expression (1) into it and the solution with respect to  $h = h_r$ . It is impossible to express the value of  $h$  in general form, since equation (3) contains this value in two terms, in one of which it is included in different (depending on  $\mu$ ) degrees. So, for example, at  $\mu = 0,5$  (plastic fabric adras or silk) the value

$$h_r = 0.5 \left( \sqrt{\frac{2.88 G_k}{c_r^2 b^2} + h_{uz}^2} - h_{uz} \right)$$

The interaction of a deformable roller with a deformable material - fabric, which is not yet described by absolutely accurate analytical characteristics, is a complex process. At the same time, it should be borne in mind that when the roller rolls on a deformable fabric, some characteristics of

the roller change, for example, its radial stiffness and the rolling coefficient of the roller on the fabric [2,3].

Since the tissue is an elastically plastic medium, the term "tissue stiffness" can be applied to it, albeit conditionally, which rather corresponds to the density of the tissue. With an increase in the "stiffness", or the compaction of the fabric, the rigidity of the roller interacting with it decreases, which leads to a decrease in the contact patch of the roller, as a result of which the roller support area decreases. If the roller is supported by both the treadmill and the sidewalls on the uncompressed fabric, then it rests on the rigid flat surface only by the treadmill, which leads to a decrease in the integral rigidity of the roller. With a change in the rigidity of the roller, its deformation changes, and in this regard, as shown above, irreversible losses and rolling resistance change.

When the roller moves over the fabric with the emulsion, the tackiness of the emulsion has a definite effect on the rolling resistance. The stickiness of the thick liquid emulsion is relatively high. There is absolutely no stickiness in dry fabric material.

The experimental results show that the adhesion of the wheel when it rolls on a solid support surface and on a deformable fabric is different. It is even a function of the mechanical properties of the fabric and the roller coating of the toist, rubber. If, when driving on hard supporting surfaces, adhesion is determined almost exclusively by the frictional properties of the roller and the rolling surface, then when moving on a deformable fabric, the resistance of the emulsion has a greater effect. This is because in many cases the frictional force between the roller surface and the fabric is less than the frictional force with dry material.

A change in rolling resistance will lead to a change in the load on the roller, when the fabric is moved with the help of two rollers pressed against each other with a certain load  $G_k - B$  this case, the resistance depends on the thickness of the fabric and its mechanical characteristics.

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INNOVATIVE TECHNOLOGIES IN LEARNING FOREIGN LANGUAGES

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**Annotation:** *this article deals with the necessity and importance of innovative technology in the foreign language classroom. It also discusses in detail multimedia technology acting as a method for special intellectual activity. This technology has a number of advantages compared with other information technology training. The use of innovative learning technology creates the most favorable conditions and contributes significantly to motivation in learning foreign languages.*

**Key words:** *multimedia learning, paradigm learning, communicative activities, student intensification of independent work.*

Learning foreign languages is impossible to imagine without the use of multimedia learning tools. Of course, important tasks for the methodology of teaching foreign languages include providing opportunities to illustrate the actual process of communication in English, and creating an educational environment that provides real conditions for learning use of the target language and its culture. The 21st century, often called the information age, is bringing about changes to the traditional teaching of language. The use of computer technology in teaching in our time is of great importance, thanks to its new possibilities. The introduction of new information and communication technology expands access to education, forming an open education system, and changes the idea of the qualifications needed by modern graduate students [1]. The most significant group of benefits is teaching the virtues of computer-based training. For example, teachers use the ability of computers to react instantly to input information to create simple training programs in the form of exercises. The technical advantage of teaching English with the help of multimedia technology is that sound cards allow users to record their speech and then compare it with the pronunciation of native speakers. Graphics capabilities of computers can represent any type of activity in the form of pictures or animation. This is particularly important when learning new vocabulary, as images on the monitor allow students to associate English phrases directly with actions, rather than with phrases in their native language. Moreover, the media are an excellent means of interactive communication between different linguistic groups, which is particularly evident in the application of computer networks. This could be a local area network connecting several machines in one class, or the Internet — a global network of millions of users [2]. These advantages allow us to conclude that multimedia learning has great potential for teaching oral speech in other languages. Through the optimal combination of a number technology (language laboratory, video, television, radio, newspapers, magazines, books, bibliographies, and phones) and having additional features (interactivity, graphics capabilities, etc.), multimedia learning provides almost limitless opportunities for teaching and learning. In recent years, there has been a tendency in the education system to change the learning paradigm, such that schools are transitioning from transfer of knowledge to students in finished form toward the organization and management of self-learning



and cognitive activity. With today's requirements for education, where a major element is independent work by students, high schools can enhance the process of learning, teaching methods, and forms of work organization that will develop the ability to learn, find needed information using a variety of information sources, and students' cognitive independence [7]. Modern pedagogical science seeks to use new technology in teaching. The aforementioned interactive media get their proper use. Most of the wide variety of interactive educational software for learning English is aimed at independent elaboration of phonetic and grammatical aspects and making their use automatic. Features of these programs include interactive dialogues, speech recognition and visualization of pronunciation, animated videos showing articulation of sounds, exercises for development of all kinds of speech skills, videos with translation, and tracking one's own learning outcomes. Since the purpose of learning the English language is communicative activity, which requires practical command of the language, the task of teachers is to revitalize all students in the learning process to create a context for their creative activity. The use of modern means, such as awareness programs and Internet technology, as well as cooperative learning and project methodology, allow us to solve these problems [9]. So, Internet sources that may come to the aid of foreign language teachers in the organization of independent work, include broadcasting, interacting with and searching in online resources, where cognitive information, training materials and conditions can be found that are conducive to the formation of professional competence for future specialists [3]. Today we have a unique helper that allows us to bring in the best teachers from many countries through the software they create. Intensification of the process of transition to an information society, associated with the widespread introduction of new information technology and computer telecommunications, necessitates the development of other forms and methods of teaching foreign languages. Along with the use of traditional technology learning, opportunities for new information technology can help teachers in the selection of more interesting and varied educational materials to carry out a differentiated approach for each student, and thereby contribute to better assimilation of necessary knowledge and skills. Among the various types of innovation, as shown by the results of a survey conducted in the universities of the CIS, teachers are most familiar with training through the use of multimedia tools (66.7 %) [6]. Multimedia technology is considered to be information technology training that integrates audiovisual information in several media (text, video, audio, graphics, animation, etc.) [4]. The use of multimedia technology in the learning process allows for improvements in the process of organic combination of traditional and innovative forms and methods of education; implementation of training, information, games, modeling, design and analysis functions; performance of such general didactic principles as visibility and accessibility; feasibility of systematic transition from education to self-education; a positive emotional background for training; and linking theory to practice [5]. In addition, multimedia technology is supported by multimedia programs, encyclopedias, dictionaries, and a special information educational environment created for holistic knowledge of the world in the context of computer-aided design and modeling. Multimedia technology acts as a special intellectual activity, which means it has a number of advantages compared with other information technology training:

1. The pedagogy means continuous improvement of content and methods of education in modern conditions.
2. Provides opportunities to identify and support students with linguistic abilities.

3. Represents the basis of distance learning.

4. Provides access to best practices in education and training of the general public through the educational world of the Internet and an extensive communication network.

5. Creates an artificial language environment, allowing the study of foreign languages (FL) at students' own pace, increasing the independence and responsibility of students when organizing FL training for all age groups, and allows students to enter into training in the intercultural component of FL.

6. Multimedia technology is new and apparently has limitless possibilities for creation of means of graphic clarity.

Multimedia (computer with additional devices) can be a powerful tool for everyone to learn foreign languages through self-study, and allow close monitoring and ongoing operational support [3].

Along with positive aspects, there are some negative trends affecting the mass creation and implementation of multimedia technology in the learning process. These include:

1. Lack of ability of existing education systems to make active use of multimedia technology, and to integrate it into the educational process and its organization;

2. Lack of a developed methodology of multimedia technology;

3. Lack of financial resources for the creation and widespread adoption of multimedia technology;

4. The device is not designed evaluation.

In order to introduce multimedia technology in the learning process, it is first necessary to create conditions for sound pedagogical and methodological application of multimedia technology. The integration of the Internet in education and, in particular, its use in the teaching of foreign languages, is now quite relevant. The combination of traditional and newer teaching methods of language teaching will ensure a higher level of learning. Unfortunately at the present time, the use of multimedia technology to intensify individual work in the study of foreign languages is largely constrained by the high cost of computer equipment, as well as the lack of a sufficient number of theoretically grounded and experimentally tested computer programs intended for independent foreign language learning.

In general, a situation currently exists in which, on the one hand, there are a small number of theoretical studies that have not been widely put into practice; and on the other, and there are many disparate programs that do not have a serious theoretical basis [8]. The current analysis showed that in pedagogical science, especially in the practice of domestic university teaching, the capabilities of learning software, including multimedia technology, are underestimated. This is due primarily to complexity and insufficient development of a theory of the concept of multimedia technology as a didactic tool.

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**ANALYSIS OF ATTRACTION AND DISTRIBUTION OF ATTRACTED RESOURCES OF INTERNATIONAL FINANCIAL INSTITUTIONS**

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**Annotation:** Commercial banks, like other subjects of economic relations, must have a certain amount of money, i.e. resources, to ensure their commercial and economic activities. The resources of commercial banks are necessary active elements of banking activity. A commercial bank, on the one hand, attracts free funds of legal entities and individuals, thereby forming a resource base, and on the other hand, places it on its own behalf at its own risk on the terms of repayment, urgency, and payment. According to the method of formation, all the resources of a commercial bank are divided into their own and borrowed (attracted). The main source of resources of commercial banks are attracted funds, which make up about 70-80% of all banking resources.

**Key words:** commercial bank, economic activities, attracted funds, banking resources, to attracts free funds, borrower, international financial institutions.

IFIs are important parts of the international financial system. Being a source of "long money", IFIs provide countries (both shareholders and others) with the opportunity to mobilize resources for the implementation of long-term strategic projects, as well as contribute to the introduction and dissemination of the best global practices of structural reforms and the development of new areas of lending (for example, "green" financing). During an economic downturn and a slowdown in the investment activity of residents of IFIs, as a rule, maintain or increase the volumes of their portfolios, thereby supporting economic activity in the countries where they operate. In recent years, IFIs have begun to actively increase their portfolios.

This is due both to an increase in lending to infrastructure projects and to the participation of IFIs in lending to national ones. International financial institutions: European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Asian Development Bank (ADB), International Bank for Reconstruction and Development (IBRD), etc. actively participate in the life of commercial banks of the Republic of Uzbekistan.

Credit lines of international financial institutions (IFIs) are the main sources of long-term financing of investment projects, including in the field of energy efficiency.

Due to the pandemic, there are changes in the trends in the development of the lending market. Thus, in 2020, the growth of the retail sector's loan portfolio accelerated by 37.4%, where the main growth is accounted for mortgage loans, car loans and microloans (the growth rate of which reached 80.6%). This trend will continue in the long term, due to COVID-19 and the process of transformation of the banking system into a new model with a focus on the development of retail lending.

In 2020, the volume of micro-loans to legal entities also has a significant increase (15.6%), which is explained by the increased need to cover the liquidity of economic entities. Microcredit is becoming the most priority area for banks, since during the transformation period banks began to

take into account the liquidity gap between short-term deposits and long-term loans. The share of microcredit in 4.7%, which is more than the share of interbank, syndicated loans and leasing with factoring combined, also contributes to the high growth prospects of this segment.

The pandemic has contributed to the creation of deferred demand for investment projects. According to the updated reports of such major international financial organizations as the European Bank for Reconstruction and Development (EBRD), the Asian Development Bank (ADB), the World Bank (WB) and the International Monetary Fund (IMF), the economic growth of the Republic of Uzbekistan slowed significantly in 2020 (Table 1)<sup>1</sup>.

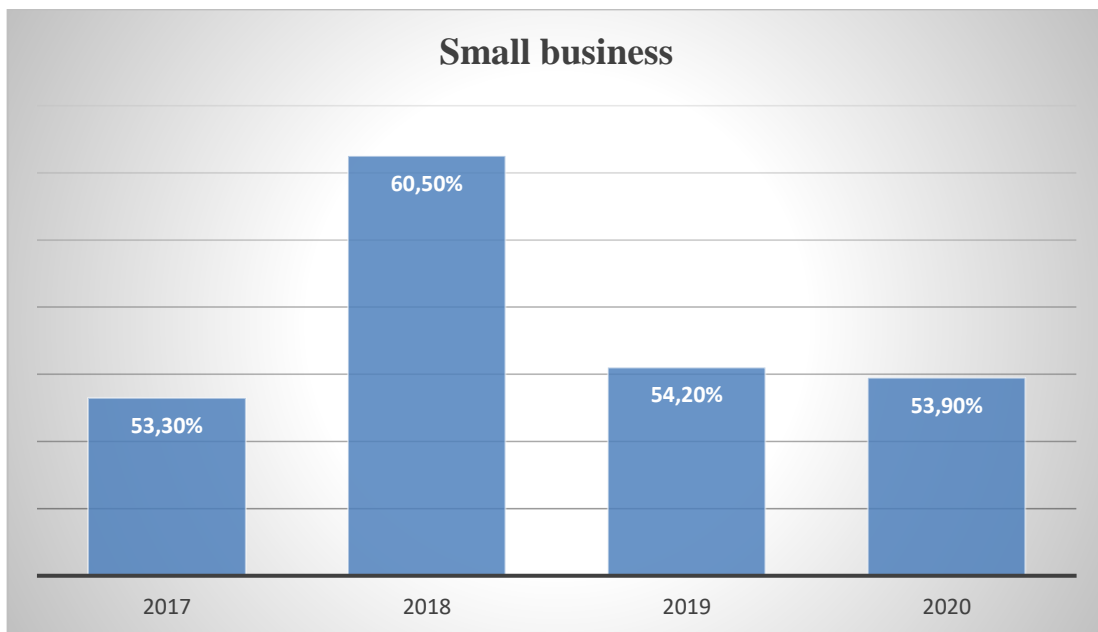
**Table 1. Comparative table of economic growth forecasts**

International financial organizations	2019	2020	2021
EBRD	5,6%	-2%	4,5%
ADB	5,6%	0,5%	6,5%
WB	5,6%	0,6%	4,3%
IMF	5,5%	1,6%	5%
CB of Uzbekistan	5,6%	1,6%	4,5%- 5,5%

Positive changes are recognized by international financial organizations. In particular, in the report of the World Bank and the International Finance Corporation "Doing Business 2020", the Republic of Uzbekistan ranked 69th, and in terms of the scale and effectiveness of the reforms carried out in the Top 20 best reformer countries in the world<sup>2</sup>.

<sup>1</sup>Forecast data of the IFI and the Ministry of Finance of the Republic of Uzbekistan

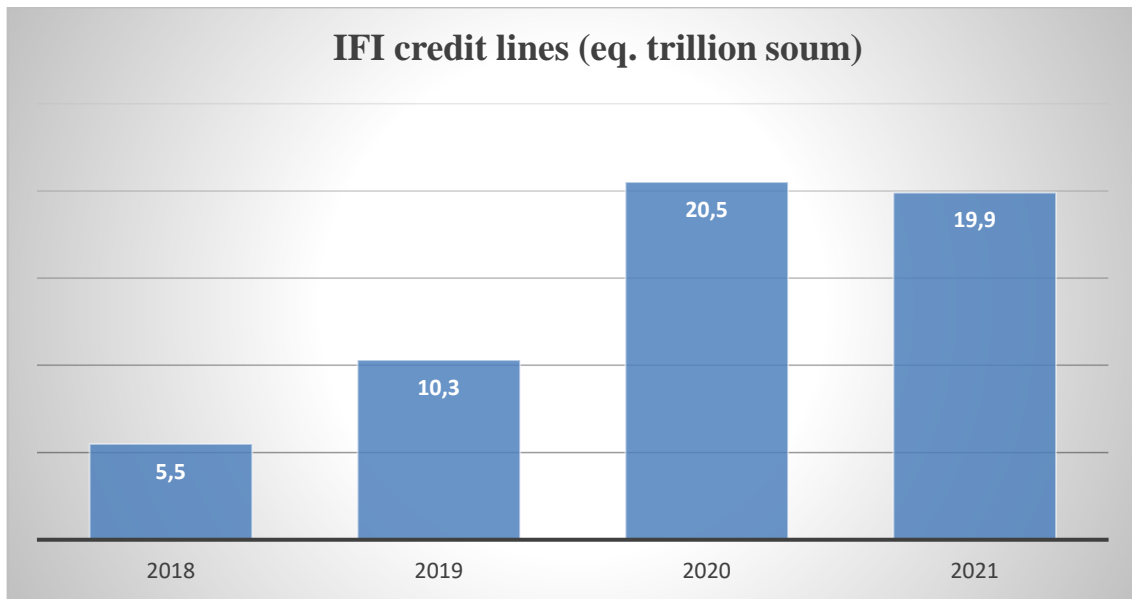
<sup>2</sup>Goskomstat of the Republic of Uzbekistan



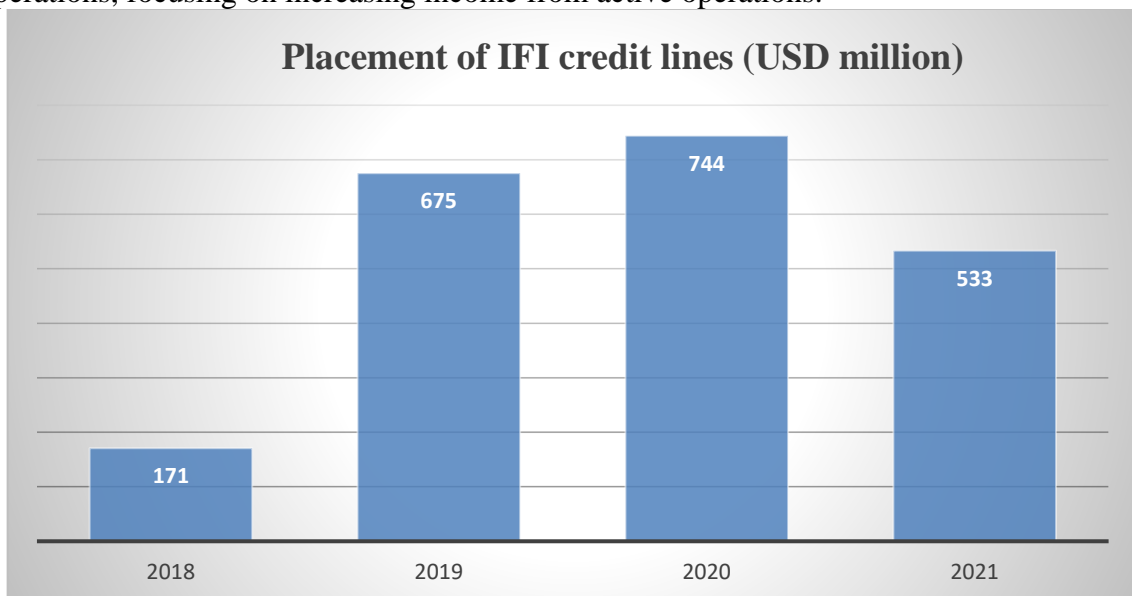
According to the Central Bank of the Republic of Uzbekistan, in 2017, eq. 19.6 trillion soums were allocated for the development of entrepreneurial activity. In 2018, the volume of lending increased 1.6% times compared to 2017 and reached eq. 30.7 trillion soums. In 2019, the allocated loans to small businesses amounted to eq. 55.4 trillion soums (increased by 80.5%), which allowed small businesses to actively develop, i.e. significantly increase the volume of development of attracted funds of IFIs. In 2020, the volume of lending to small businesses amounted to eq. 19.4 trillion soums, which decreased by 12.7% compared to the same period in 2019. This, in turn, is also explained by the decline in the activity of the placement of attracted IFI funds during the quarantine measures.

Using the example of the Uzpromstroybank JSCB (hereinafter referred to as the Bank), one can see the dynamics of the growth of attracted funds of IFIs. To date, the Bank is actively developing the passive part, focusing on small and large funds, including attracted funds from IFIs, as this is considered a stable source of funds, allowing it to concentrate on creating a set of passive products using targeted transaction accounts<sup>3</sup>.

<sup>3</sup><https://www.sqb.uz>



Analyzing the diagram, we can conclude that in 2018, the amount of IFI's loan funds amounted to eq. 5.5 trillion soum, in 2019, the amount of IFI funds amounted to eq. 10.3 trillion soum, and this indicates that there has been a significant increase in attracting IFI funds, the growth was +87%. In 2020, the amount of attracted IFI loan funds amounted to eq. 20.5 trillion soum, and by the end of 2021, this amount decreased and amounted to eq. 19.9 trillion soum (decrease by 12%). The situation related to COVID-19, which covered the whole world, affected the decline in attracting IFI funds. Also, using the example of the Uzpromstroybank JSCB (hereinafter referred to as the Bank), you can see the disbursement of IFI funds. To date, the Bank is actively developing active operations, focusing on increasing income from active operations.



Analyzing the data, we can conclude that in 2018 the amount of disbursed loan funds IFIs was 171 million USA, in 2019 the amount of development amounted to the \$ 675 million USA, and this reflects a significant increase in the utilization of MFIs, the increase was +295%. In 2020 disbursed loan funds IFIs amounted to 744 million USA, in 2021 the amount of development amounted to 533 million USA and this reflects a significant decrease in the absorptive IFIs, the decrease amounted to -3%. As well as the situation with attraction, the situation related to COVID-19 affected the decrease in the disbursement of the funds raised by the IFI.

Taking into account the above and the current difficult period, commercial banks need to pay due attention to the activation of the competent placement of attracted IFI funds. To do this, first of all, it is necessary:

- manage your financial situation wisely in accordance with sound banking and financial policies. In accordance with this, the bank will comply with the requirements of the regulator;
- continue to implement a client-centric approach of the business, which allows to fully meet the needs of the client in banking products and services;
- development of the existing business model with a special emphasis on an individual client approach based on industry specifics and an in-depth understanding of the client's needs;
- active participation in the economic development of the country and strategic national projects, providing its corporate clients with a wide range of opportunities for infrastructural transformations of system-forming industries by providing banking services in accordance with international standards;
- improving the efficiency of clients' business through knowledge of the industry specifics of each corporate client and the use of the most relevant banking instruments;
- creation of structural financing, which will ensure the attraction of direct investments and loans from foreign financial institutions to finance projects of corporate clients without affecting the bank's balance sheet.

Summing up, it can be concluded that the key tool for the effective implementation of the system of timely and competent disbursement of funds is to increase the potential of employees, the competent allocation of human, time and financial resources of the bank.

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